SCons

API Documentation

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Contents

Contents **1**

1 Package SCons **2**
1.1 Modules . . . 2
1.2 Variables . . . 5

2 Module SCons.Action **6**
2.1 Functions . . . 7
2.2 Variables . . . 7
2.3 Class ActionBase . . . 8
2.3.1 Methods . . . 8
2.3.2 Properties . . . 9
2.4 Class CommandAction . . . 10
2.4.1 Methods . . . 10
2.4.2 Properties . . . 12
2.5 Class CommandGeneratorAction . . . 12
2.5.1 Methods . . . 12
2.5.2 Properties . . . 14
2.6 Class LazyAction . . . 14
2.6.1 Methods . . . 14
2.6.2 Properties . . . 16
2.7 Class FunctionAction . . . 17
2.7.1 Methods . . . 17
2.7.2 Properties . . . 19
2.8 Class ListAction . . . 19
2.8.1 Methods . . . 19
2.8.2 Properties . . . 21
2.9 Class ActionCaller . . . 21
2.9.1 Methods . . . 21
2.9.2 Properties . . . 22
2.10 Class ActionFactory . . . 22
2.10.1 Methods . . . 23
2.10.2 Properties . . . 23

3 Module SCons.Builder **25**
3.1 Functions . . . 26
3.2 Variables . . . 26

3.3 Class DictCmdGenerator . . . 27
3.3.1 Methods . . . 27
3.4 Class CallableSelector . . . 28
3.4.1 Methods . . . 29
3.5 Class DictEmitter . . . 30
3.5.1 Methods . . . 30
3.6 Class ListEmitter . . . 31
3.6.1 Methods . . . 32
3.7 Class OverrideWarner . . . 33
3.7.1 Methods . . . 33
3.8 Class EmitterProxy . . . 34
3.8.1 Methods . . . 35
3.8.2 Properties . . . 36
3.9 Class BuilderBase . . . 36
3.9.1 Methods . . . 36
3.9.2 Properties . . . 38
3.9.3 Class Variables . . . 39
3.10 Class CompositeBuilder . . . 39
3.10.1 Methods . . . 39
3.10.2 Properties . . . 40

4 Module SCons.CacheDir 41
4.1 Functions . . . 41
4.2 Variables . . . 41
4.3 Class CacheDir . . . 41
4.3.1 Methods . . . 41
4.3.2 Properties . . . 43

5 Module SCons.Conftest 44
5.1 Functions . . . 44
5.2 Variables . . . 47

6 Module SCons.Debug 48
6.1 Functions . . . 48
6.2 Variables . . . 48

7 Module SCons.Defaults 50
7.1 Functions . . . 50
7.2 Variables . . . 51
7.3 Class NullCmdGenerator . . . 52
7.3.1 Methods . . . 52
7.3.2 Properties . . . 53
7.4 Class Variable_Method_Caller . . . 53
7.4.1 Methods . . . 53
7.4.2 Properties . . . 54

8 Module SCons.Environment 55
8.1 Functions . . . 55
8.2 Variables . . . 55
8.3 Class MethodWrapper . . . 56
8.3.1 Methods . . . 56
8.3.2 Properties . . . 57

8.4 Class BuilderWrapper . . . 57
8.4.1 Methods . . . 58
8.4.2 Properties . . . 59
8.5 Class BuilderDict . . . 59
8.5.1 Methods . . . 59
8.6 Class SubstitutionEnvironment . . . 60
8.6.1 Methods . . . 61
8.6.2 Properties . . . 64
8.6.3 Class Variables . . . 64
8.7 Class Base . . . 64
8.7.1 Methods . . . 65
8.7.2 Properties . . . 74
8.7.3 Class Variables . . . 74
8.8 Class OverrideEnvironment . . . 74
8.8.1 Methods . . . 75
8.8.2 Properties . . . 84
8.8.3 Class Variables . . . 84
8.9 Class Base . . . 85
8.9.1 Methods . . . 85
8.9.2 Properties . . . 94
8.9.3 Class Variables . . . 94

9 Module SCons.Errors 96
9.1 Functions . . . 96
9.2 Variables . . . 96
9.3 Class BuildError . . . 96
9.3.1 Methods . . . 97
9.3.2 Properties . . . 99
9.4 Class InternalError . . . 99
9.4.1 Methods . . . 99
9.4.2 Properties . . . 100
9.5 Class UserError . . . 101
9.5.1 Methods . . . 101
9.5.2 Properties . . . 102
9.6 Class StopError . . . 102
9.6.1 Methods . . . 103
9.6.2 Properties . . . 104
9.7 Class EnvironmentError . . . 104
9.7.1 Methods . . . 104
9.7.2 Properties . . . 105
9.8 Class MSVCError . . . 106
9.8.1 Methods . . . 106
9.8.2 Properties . . . 107
9.9 Class ExplicitExit . . . 108
9.9.1 Methods . . . 108
9.9.2 Properties . . . 109

10 Module SCons.Executor 110
10.1 Functions . . . 110
10.2 Variables . . . 110
10.3 Class Batch . . . 110
10.3.1 Methods . . . 110

10.3.2 Properties . . . 111
10.4 Class TSList . . . 111
10.4.1 Methods . . . 112
10.5 Class TSObject . . . 113
10.5.1 Methods . . . 114
10.5.2 Properties . . . 114
10.6 Class Executor . . . 115
10.6.1 Methods . . . 115
10.6.2 Properties . . . 118
10.6.3 Class Variables . . . 118
10.6.4 Instance Variables . . . 118
10.7 Class Null . . . 119
10.7.1 Methods . . . 119
10.7.2 Properties . . . 120

11 Module SCons.Job **121**
11.1 Variables . . . 121
11.2 Class InterruptState . . . 121
11.2.1 Methods . . . 121
11.2.2 Properties . . . 122
11.3 Class Jobs . . . 122
11.3.1 Methods . . . 123
11.3.2 Properties . . . 124
11.4 Class Serial . . . 124
11.4.1 Methods . . . 124
11.4.2 Properties . . . 125
11.5 Class Worker . . . 126
11.5.1 Methods . . . 126
11.5.2 Properties . . . 127
11.6 Class ThreadPool . . . 127
11.6.1 Methods . . . 127
11.6.2 Properties . . . 129
11.7 Class Parallel . . . 129
11.7.1 Methods . . . 129
11.7.2 Properties . . . 130

12 Module SCons.Memoize **131**
12.1 Functions . . . 132
12.2 Variables . . . 133
12.3 Class Counter . . . 133
12.3.1 Methods . . . 133
12.3.2 Properties . . . 134
12.4 Class CountValue . . . 134
12.4.1 Methods . . . 135
12.4.2 Properties . . . 136
12.5 Class CountDict . . . 136
12.5.1 Methods . . . 136
12.5.2 Properties . . . 137
12.6 Class Memoizer . . . 137
12.6.1 Methods . . . 137
12.6.2 Properties . . . 138
12.7 Class Memoized_Metaclass . . . 138

12.7.1 Methods . . . 139
12.7.2 Properties . . . 140

13 Package SCons.Node **141**
13.1 Modules . . . 141
13.2 Functions . . . 141
13.3 Variables . . . 141
13.4 Class NodeInfoBase . . . 142
13.4.1 Methods . . . 142
13.4.2 Properties . . . 143
13.4.3 Class Variables . . . 143
13.5 Class BuildInfoBase . . . 144
13.5.1 Methods . . . 144
13.5.2 Properties . . . 145
13.5.3 Class Variables . . . 145
13.6 Class Node . . . 145
13.6.1 Methods . . . 145
13.6.2 Properties . . . 156
13.6.3 Class Variables . . . 156
13.7 Class NodeList . . . 156
13.7.1 Methods . . . 156
13.8 Class Walker . . . 158
13.8.1 Methods . . . 158
13.8.2 Properties . . . 159

14 Module SCons.Node.Alias **160**
14.1 Variables . . . 160
14.2 Class AliasNameSpace . . . 160
14.2.1 Methods . . . 160
14.3 Class AliasNodeInfo . . . 161
14.3.1 Methods . . . 161
14.3.2 Properties . . . 163
14.3.3 Class Variables . . . 163
14.4 Class AliasBuildInfo . . . 163
14.4.1 Methods . . . 163
14.4.2 Properties . . . 164
14.4.3 Class Variables . . . 164
14.5 Class Alias . . . 164
14.5.1 Methods . . . 165
14.5.2 Properties . . . 176
14.5.3 Class Variables . . . 176

15 Module SCons.Node.FS **177**
15.1 Functions . . . 177
15.2 Variables . . . 178
15.3 Class EntryProxyAttributeError . . . 179
15.3.1 Methods . . . 179
15.3.2 Properties . . . 181
15.4 Class DiskChecker . . . 181
15.4.1 Methods . . . 181
15.4.2 Properties . . . 182
15.5 Class EntryProxy . . . 182

15.5.1 Methods . . . 182
15.5.2 Properties . . . 184
15.5.3 Class Variables . . . 184
15.6 Class Base . . . 184
15.6.1 Methods . . . 184
15.6.2 Properties . . . 197
15.6.3 Class Variables . . . 197
15.7 Class Entry . . . 197
15.7.1 Methods . . . 197
15.7.2 Properties . . . 210
15.7.3 Class Variables . . . 210
15.8 Class LocalFS . . . 211
15.8.1 Methods . . . 211
15.8.2 Properties . . . 212
15.8.3 Class Variables . . . 213
15.9 Class FS . . . 213
15.9.1 Methods . . . 213
15.9.2 Properties . . . 216
15.9.3 Class Variables . . . 216
15.10 Class DirNodeInfo . . . 217
15.10.1 Methods . . . 217
15.10.2 Properties . . . 218
15.10.3 Class Variables . . . 218
15.11 Class DirBuildInfo . . . 218
15.11.1 Methods . . . 219
15.11.2 Properties . . . 219
15.11.3 Class Variables . . . 220
15.12 Class Dir . . . 220
15.12.1 Methods . . . 220
15.12.2 Properties . . . 235
15.12.3 Class Variables . . . 235
15.13 Class RootDir . . . 236
15.13.1 Methods . . . 236
15.13.2 Properties . . . 252
15.13.3 Class Variables . . . 252
15.14 Class FileNodeInfo . . . 252
15.14.1 Methods . . . 252
15.14.2 Properties . . . 254
15.14.3 Class Variables . . . 254
15.15 Class FileBuildInfo . . . 254
15.15.1 Methods . . . 254
15.15.2 Properties . . . 256
15.15.3 Class Variables . . . 256
15.16 Class File . . . 256
15.16.1 Methods . . . 256
15.16.2 Properties . . . 270
15.16.3 Class Variables . . . 270
15.17 Class FileFinder . . . 271
15.17.1 Methods . . . 271
15.17.2 Properties . . . 272
15.17.3 Class Variables . . . 272

16 Module SCons.Node.Python **273**
16.1 Variables . . . 273
16.2 Class ValueNodeInfo . . . 273
16.2.1 Methods . . . 273
16.2.2 Properties . . . 274
16.2.3 Class Variables . . . 274
16.3 Class ValueBuildInfo . . . 275
16.3.1 Methods . . . 275
16.3.2 Properties . . . 276
16.3.3 Class Variables . . . 276
16.4 Class Value . . . 276
16.4.1 Methods . . . 276
16.4.2 Properties . . . 287
16.4.3 Class Variables . . . 287

17 Module SCons.PathList **288**
17.1 Functions . . . 288
17.2 Variables . . . 288

18 Module SCons.SConf **289**
18.1 Functions . . . 289
18.2 Variables . . . 290
18.3 Class SConfWarning . . . 291
18.3.1 Methods . . . 291
18.3.2 Properties . . . 292
18.4 Class SConfError . . . 292
18.4.1 Methods . . . 293
18.4.2 Properties . . . 294
18.5 Class ConfigureDryRunError . . . 294
18.5.1 Methods . . . 294
18.5.2 Properties . . . 296
18.6 Class ConfigureCacheError . . . 296
18.6.1 Methods . . . 296
18.6.2 Properties . . . 297
18.7 Class SConfBuildInfo . . . 298
18.7.1 Methods . . . 298
18.7.2 Properties . . . 299
18.7.3 Class Variables . . . 299
18.8 Class Streamer . . . 300
18.8.1 Methods . . . 300
18.8.2 Properties . . . 301
18.9 Class SConfBuildTask . . . 301
18.9.1 Methods . . . 302
18.9.2 Properties . . . 306
18.10 Class SConfBase . . . 307
18.10.1 Methods . . . 307
18.10.2 Properties . . . 309
18.11 Class CheckContext . . . 310
18.11.1 Methods . . . 310
18.11.2 Properties . . . 312

19 Module SCons.SConsign **313**

19.1 Functions . . . 313
19.2 Variables . . . 313
19.3 Class SConsignEntry . . . 313
19.3.1 Methods . . . 314
19.3.2 Properties . . . 314
19.3.3 Class Variables . . . 315
19.4 Class Base . . . 315
19.4.1 Methods . . . 315
19.4.2 Properties . . . 316
19.5 Class DB . . . 316
19.5.1 Methods . . . 317
19.5.2 Properties . . . 318
19.6 Class Dir . . . 318
19.6.1 Methods . . . 318
19.6.2 Properties . . . 319
19.7 Class DirFile . . . 320
19.7.1 Methods . . . 320
19.7.2 Properties . . . 321
19.8 Class DB . . . 322
19.8.1 Methods . . . 322
19.8.2 Properties . . . 323

20 Package SCons.Scanner 324
20.1 Modules . . . 324
20.2 Functions . . . 324
20.3 Variables . . . 324
20.4 Class FindPathDirs . . . 325
20.4.1 Methods . . . 325
20.4.2 Properties . . . 326
20.5 Class Base . . . 326
20.5.1 Methods . . . 326
20.5.2 Properties . . . 328
20.6 Class Selector . . . 329
20.6.1 Methods . . . 331
20.6.2 Properties . . . 333
20.7 Class Current . . . 333
20.7.1 Methods . . . 335
20.7.2 Properties . . . 337
20.8 Class Classic . . . 337
20.8.1 Methods . . . 337
20.8.2 Properties . . . 339
20.9 Class ClassicCPP . . . 339
20.9.1 Methods . . . 339
20.9.2 Properties . . . 341

21 Module SCons.Scanner.C 342
21.1 Functions . . . 342
21.2 Variables . . . 342
21.3 Class SConsCPPScanner . . . 342
21.3.1 Methods . . . 342
21.3.2 Properties . . . 346
21.4 Class SConsCPPScannerWrapper . . . 347

21.4.1 Methods . . . 347
21.4.2 Properties . . . 348

22 Module SCons.Scanner.D 349
22.1 Functions . . . 349
22.2 Variables . . . 349
22.3 Class D . . . 349
22.3.1 Methods . . . 349
22.3.2 Properties . . . 351

23 Module SCons.Scanner.Dir 352
23.1 Functions . . . 352
23.2 Variables . . . 352

24 Module SCons.Scanner.Fortran 353
24.1 Functions . . . 353
24.2 Variables . . . 353
24.3 Class F90Scanner . . . 353
24.3.1 Methods . . . 353
24.3.2 Properties . . . 355

25 Module SCons.Scanner.IDL 356
25.1 Functions . . . 356
25.2 Variables . . . 356

26 Module SCons.Scanner.LaTeX 357
26.1 Functions . . . 357
26.2 Variables . . . 357
26.3 Class FindENVPathDirs . . . 357
26.3.1 Methods . . . 357
26.3.2 Properties . . . 358
26.4 Class LaTeX . . . 358
26.4.1 Methods . . . 361
26.4.2 Properties . . . 363
26.4.3 Class Variables . . . 363

27 Module SCons.Scanner.Prog 364
27.1 Functions . . . 364
27.2 Variables . . . 364

28 Module SCons.Scanner.RC 365
28.1 Functions . . . 365
28.2 Variables . . . 365

29 Package SCons.Script 366
29.1 Modules . . . 366
29.2 Functions . . . 366
29.3 Variables . . . 366
29.4 Class TargetList . . . 370
29.4.1 Methods . . . 370

30 Module SCons.Script.Interactive 373
30.1 Functions . . . 373

30.2 Variables . . . 373
30.3 Class SConsInteractiveCmd . . . 373
30.3.1 Methods . . . 373
30.3.2 Class Variables . . . 376

31 Module SCons.Script.Main 377
31.1 Functions . . . 377
31.2 Variables . . . 377
31.3 Class SConsPrintHelpException . . . 378
31.3.1 Methods . . . 378
31.3.2 Properties . . . 379
31.4 Class Progressor . . . 380
31.4.1 Methods . . . 380
31.4.2 Properties . . . 381
31.4.3 Class Variables . . . 381
31.5 Class BuildTask . . . 381
31.5.1 Methods . . . 382
31.5.2 Properties . . . 386
31.5.3 Class Variables . . . 386
31.6 Class CleanTask . . . 386
31.6.1 Methods . . . 386
31.6.2 Properties . . . 391
31.7 Class QuestionTask . . . 391
31.7.1 Methods . . . 392
31.7.2 Properties . . . 396
31.8 Class TreePrinter . . . 396
31.8.1 Methods . . . 396
31.8.2 Properties . . . 397
31.9 Class FakeOptionParser . . . 398
31.9.1 Methods . . . 398
31.9.2 Properties . . . 399
31.9.3 Class Variables . . . 399
31.10 Class Stats . . . 399
31.10.1 Methods . . . 399
31.10.2 Properties . . . 400
31.11 Class CountStats . . . 400
31.11.1 Methods . . . 400
31.11.2 Properties . . . 401
31.12 Class MemStats . . . 402
31.12.1 Methods . . . 402
31.12.2 Properties . . . 403

32 Module SCons.Script.SConscript' 404
32.1 Functions . . . 404
32.2 Variables . . . 404
32.3 Class SConscriptReturn . . . 405
32.3.1 Methods . . . 405
32.3.2 Properties . . . 406
32.4 Class Frame . . . 406
32.4.1 Methods . . . 407
32.4.2 Properties . . . 407
32.5 Class SConsEnvironment . . . 408

32.5.1 Methods . . . 408
32.5.2 Properties . . . 418
32.5.3 Class Variables . . . 418
32.6 Class DefaultEnvironmentCall . . . 418
32.6.1 Methods . . . 418
32.6.2 Properties . . . 419

33 Module SCons.Sig 420
33.1 Variables . . . 420
33.2 Class MD5Null . . . 420
33.2.1 Methods . . . 420
33.2.2 Properties . . . 421
33.3 Class TimeStampNull . . . 422
33.3.1 Methods . . . 422
33.3.2 Properties . . . 423

34 Module SCons.Subst 424
34.1 Functions . . . 424
34.2 Variables . . . 425
34.3 Class Literal . . . 425
34.3.1 Methods . . . 426
34.3.2 Properties . . . 427
34.4 Class SpecialAttrWrapper . . . 427
34.4.1 Methods . . . 427
34.4.2 Properties . . . 428
34.5 Class CmdStringHolder . . . 428
34.5.1 Methods . . . 428
34.6 Class NLWrapper . . . 431
34.6.1 Methods . . . 432
34.6.2 Properties . . . 432
34.7 Class Targets_or_Sources . . . 433
34.7.1 Methods . . . 433
34.8 Class Target_or_Source . . . 434
34.8.1 Methods . . . 435
34.8.2 Properties . . . 436
34.9 Class NullNodeList . . . 436
34.9.1 Methods . . . 436
34.9.2 Properties . . . 437

35 Module SCons.Taskmaster 438
35.1 Functions . . . 438
35.2 Variables . . . 438
35.3 Class Stats . . . 439
35.3.1 Methods . . . 439
35.3.2 Properties . . . 440
35.4 Class Task . . . 440
35.4.1 Methods . . . 441
35.4.2 Properties . . . 445
35.5 Class AlwaysTask . . . 445
35.5.1 Methods . . . 446
35.5.2 Properties . . . 450
35.6 Class OutOfDateTask . . . 450

35.6.1 Methods . . . 450
35.6.2 Properties . . . 455
35.7 Class Taskmaster . . . 455
35.7.1 Methods . . . 455
35.7.2 Properties . . . 457

36 Module SCons.Util **459**
36.1 Functions . . . 459
36.2 Variables . . . 464
36.3 Class NodeList . . . 465
36.3.1 Methods . . . 465
36.4 Class DisplayEngine . . . 467
36.4.1 Methods . . . 467
36.4.2 Properties . . . 468
36.4.3 Class Variables . . . 468
36.5 Class Proxy . . . 468
36.5.1 Methods . . . 469
36.5.2 Properties . . . 470
36.6 Class Delegate . . . 470
36.6.1 Methods . . . 470
36.6.2 Properties . . . 471
36.7 Class _NoError . . . 471
36.7.1 Methods . . . 471
36.7.2 Properties . . . 473
36.8 Class WindowsError . . . 473
36.8.1 Methods . . . 473
36.8.2 Properties . . . 474
36.9 Class CLVar . . . 475
36.9.1 Methods . . . 475
36.10Class OrderedDict . . . 477
36.10.1Methods . . . 477
36.11Class Selector . . . 478
36.11.1Methods . . . 478
36.12Class LogicalLines . . . 480
36.12.1Methods . . . 480
36.12.2Properties . . . 481
36.13Class UniqueList . . . 481
36.13.1Methods . . . 481
36.14Class Unbuffered . . . 483
36.14.1Methods . . . 483
36.14.2Properties . . . 484
36.15Class Null . . . 484
36.15.1Methods . . . 484
36.15.2Properties . . . 485
36.16Class NullSeq . . . 486
36.16.1Methods . . . 486
36.16.2Properties . . . 487

37 Package SCons.Variables **488**
37.1 Modules . . . 488
37.2 Variables . . . 488
37.3 Class Variables . . . 488

37.3.1 Methods . . . 488
37.3.2 Properties . . . 491
37.3.3 Class Variables . . . 491

38 Module SCons.Variables.BoolVariable' 492
38.1 Functions . . . 492

39 Module SCons.Variables.EnumVariable' 493
39.1 Functions . . . 493

40 Module SCons.Variables.ListVariable' 494
40.1 Functions . . . 494

41 Module SCons.Variables.PackageVariable' 495
41.1 Functions . . . 495

42 Module SCons.Variables.PathVariable' 496
42.1 Variables . . . 496

43 Module SCons.Warnings 498
43.1 Functions . . . 498
43.2 Variables . . . 498
43.3 Class Warning . . . 499
43.3.1 Methods . . . 499
43.3.2 Properties . . . 500
43.4 Class WarningOnByDefault . . . 501
43.4.1 Methods . . . 501
43.4.2 Properties . . . 502
43.5 Class CacheWriteErrorWarning . . . 503
43.5.1 Methods . . . 503
43.5.2 Properties . . . 504
43.6 Class CorruptSConsignWarning . . . 505
43.6.1 Methods . . . 505
43.6.2 Properties . . . 506
43.7 Class DependencyWarning . . . 507
43.7.1 Methods . . . 507
43.7.2 Properties . . . 508
43.8 Class DuplicateEnvironmentWarning . . . 509
43.8.1 Methods . . . 509
43.8.2 Properties . . . 510
43.9 Class FutureReservedVariableWarning . . . 511
43.9.1 Methods . . . 511
43.9.2 Properties . . . 512
43.10 Class LinkWarning . . . 513
43.10.1 Methods . . . 513
43.10.2 Properties . . . 514
43.11 Class MisleadingKeywordsWarning . . . 515
43.11.1 Methods . . . 515
43.11.2 Properties . . . 516
43.12 Class MissingSConscriptWarning . . . 517
43.12.1 Methods . . . 517
43.12.2 Properties . . . 518

43.13Class NoMD5ModuleWarning . . . 519
43.13.1 Methods . . . 519
43.13.2 Properties . . . 520
43.14Class NoMetaclassSupportWarning . . . 521
43.14.1 Methods . . . 521
43.14.2 Properties . . . 522
43.15Class NoObjectCountWarning . . . 523
43.15.1 Methods . . . 523
43.15.2 Properties . . . 524
43.16Class NoParallelSupportWarning . . . 525
43.16.1 Methods . . . 525
43.16.2 Properties . . . 526
43.17Class ReservedVariableWarning . . . 527
43.17.1 Methods . . . 527
43.17.2 Properties . . . 528
43.18Class StackSizeWarning . . . 529
43.18.1 Methods . . . 529
43.18.2 Properties . . . 530
43.19Class VisualCMissingWarning . . . 531
43.19.1 Methods . . . 531
43.19.2 Properties . . . 532
43.20Class VisualVersionMismatch . . . 533
43.20.1 Methods . . . 533
43.20.2 Properties . . . 534
43.21Class VisualStudioMissingWarning . . . 535
43.21.1 Methods . . . 535
43.21.2 Properties . . . 536
43.22Class FortranCxxMixWarning . . . 537
43.22.1 Methods . . . 537
43.22.2 Properties . . . 538
43.23Class FutureDeprecatedWarning . . . 539
43.23.1 Methods . . . 539
43.23.2 Properties . . . 540
43.24Class DeprecatedWarning . . . 541
43.24.1 Methods . . . 541
43.24.2 Properties . . . 542
43.25Class MandatoryDeprecatedWarning . . . 543
43.25.1 Methods . . . 543
43.25.2 Properties . . . 544
43.26Class PythonVersionWarning . . . 545
43.26.1 Methods . . . 545
43.26.2 Properties . . . 546
43.27Class DeprecatedSourceCodeWarning . . . 547
43.27.1 Methods . . . 547
43.27.2 Properties . . . 548
43.28Class DeprecatedBuildDirWarning . . . 549
43.28.1 Methods . . . 549
43.28.2 Properties . . . 550
43.29Class TaskmasterNeedsExecuteWarning . . . 551
43.29.1 Methods . . . 551
43.29.2 Properties . . . 552

43.30Class DeprecatedCopyWarning . . . 553
43.30.1 Methods . . . 553
43.30.2 Properties . . . 554
43.31Class DeprecatedOptionsWarning . . . 555
43.31.1 Methods . . . 555
43.31.2 Properties . . . 556
43.32Class DeprecatedSourceSignaturesWarning . . . 557
43.32.1 Methods . . . 557
43.32.2 Properties . . . 558
43.33Class DeprecatedTargetSignaturesWarning . . . 559
43.33.1 Methods . . . 559
43.33.2 Properties . . . 560
43.34Class DeprecatedDebugOptionsWarning . . . 561
43.34.1 Methods . . . 561
43.34.2 Properties . . . 562
43.35Class DeprecatedSigModuleWarning . . . 563
43.35.1 Methods . . . 563
43.35.2 Properties . . . 564
43.36Class DeprecatedBuilderKeywordsWarning . . . 565
43.36.1 Methods . . . 565
43.36.2 Properties . . . 566

44 Package SCons.compat **567**
44.1 Modules . . . 567
44.2 Functions . . . 568
44.3 Variables . . . 568

45 Module SCons.compat._scons_builtins **569**
45.1 Functions . . . 569
45.2 Variables . . . 569
45.3 Class memoryview . . . 570
45.3.1 Methods . . . 570
45.3.2 Properties . . . 571

46 Module SCons.compat._scons_collections **572**
46.1 Variables . . . 572

47 Module SCons.compat._scons_dbm **573**
47.1 Functions . . . 573
47.2 Variables . . . 573
47.3 Class error . . . 573
47.3.1 Methods . . . 573
47.3.2 Properties . . . 574

48 Module SCons.compat._scons_hashlib **576**
48.1 Functions . . . 576
48.2 Variables . . . 576
48.3 Class md5obj . . . 576
48.3.1 Methods . . . 576
48.3.2 Properties . . . 577
48.3.3 Class Variables . . . 577
48.4 Class md5obj . . . 578

48.4.1 Methods . . . 578
48.4.2 Properties . . . 579
48.4.3 Class Variables . . . 579

49 Module SCons.compat._scons_io 580
49.1 Variables . . . 580

50 Module SCons.compat._scons_sets 581
50.1 Class BaseSet . . . 581
50.1.1 Methods . . . 582
50.1.2 Properties . . . 585
50.2 Class ImmutableSet . . . 585
50.2.1 Methods . . . 585
50.2.2 Properties . . . 588
50.3 Class Set . . . 588
50.3.1 Methods . . . 589
50.3.2 Properties . . . 593

51 Module SCons.compat._scons_subprocess 594
51.1 Functions . . . 600
51.2 Variables . . . 601
51.3 Class CalledProcessError . . . 601
51.3.1 Methods . . . 601
51.3.2 Properties . . . 602
51.4 Class Popen . . . 603
51.4.1 Methods . . . 603
51.4.2 Properties . . . 604

52 Module SCons.cpp 605
52.1 Functions . . . 605
52.2 Variables . . . 605
52.3 Class FunctionEvaluator . . . 605
52.3.1 Methods . . . 606
52.3.2 Properties . . . 607
52.4 Class PreProcessor . . . 607
52.4.1 Methods . . . 607
52.4.2 Properties . . . 611
52.5 Class DumbPreProcessor . . . 611
52.5.1 Methods . . . 611
52.5.2 Properties . . . 615

53 Module SCons.dblite 616
53.1 Functions . . . 616
53.2 Variables . . . 616
53.3 Class dblite . . . 616
53.3.1 Methods . . . 616
53.3.2 Properties . . . 617

54 Module SCons.exitfuncs 618
54.1 Functions . . . 618
54.2 Variables . . . 618

55 Module md5 619

55.1 Variables 619

1 Package SCons

`SCons`

`The main package for the SCons software construction utility.`

Version: 2.0.0.final.0

Date: 2010/06/14 22:05:46

1.1 Modules

- **Action**: SCons.Action
  This encapsulates information about executing any sort of action that can build one or more target Nodes (typically files) from one or more source Nodes (also typically files) given a specific Environment.
  (Section 2, p. 6)
- **Builder**: SCons.Builder
  Builder object subsystem.
  (Section 3, p. 25)
- **CacheDir**: CacheDir support
  (Section 4, p. 41)
- **Conftest**: SCons.Conftest
  Autoconf-like configuration support; low level implementation of tests.
  (Section 5, p. 44)
- **Debug**: SCons.Debug
  Code for debugging SCons internal things.
  (Section 6, p. 48)
- **Defaults**: SCons.Defaults
  Builders and other things for the local site.
  (Section 7, p. 50)
- **Environment**: SCons.Environment
  Base class for construction Environments.
  (Section 8, p. 55)
- **Errors**: SCons.Errors
  This file contains the exception classes used to handle internal and user errors in SCons.
  (Section 9, p. 96)
- **Executor**: SCons.Executor
  A module for executing actions with specific lists of target and source Nodes.
  (Section 10, p. 110)
- **Job**: SCons.Job
  This module defines the Serial and Parallel classes that execute tasks to complete a build.
  (Section 11, p. 121)
- **Memoize**: Memoizer
  A metaclass implementation to count hits and misses of the computed values that various methods cache in memory.
  (Section 12, p. 131)
- **Node**: SCons.Node
  The Node package for the SCons software construction utility.
  (Section 13, p. 141)
  - **Alias**: scons.Node.Alias
    Alias nodes.
    (Section 14, p. 160)

  - **FS**: scons.Node.FS
    File system nodes.
    (Section 15, p. 177)
  - **Python**: scons.Node.Python
    Python nodes.
    (Section 16, p. 273)
- **PathList**: SCons.PathList
  A module for handling lists of directory paths (the sort of things that get set as CPPPATH, LIBPATH, etc.) with as much caching of data and efficiency as we can while still keeping the evaluation delayed so that we Do the Right Thing (almost) regardless of how the variable is specified.
  (Section 17, p. 288)
- **SConf**: SCons.SConf
  Autoconf-like configuration support.
  (Section 18, p. 289)
- **SConsign**: SCons.SConsign
  Writing and reading information to the .sconsign file or files.
  (Section 19, p. 313)
- **Scanner**: SCons.Scanner
  The Scanner package for the SCons software construction utility.
  (Section 20, p. 324)
  - **C**: SCons.Scanner.C
    This module implements the depenency scanner for C/C++ code.
    (Section 21, p. 342)
  - **D**: SCons.Scanner.D
    Scanner for the Digital Mars "D" programming language.
    (Section 22, p. 349)
  - **Dir** *(Section 23, p. 352)*
  - **Fortran**: SCons.Scanner.Fortran
    This module implements the dependency scanner for Fortran code.
    (Section 24, p. 353)
  - **IDL**: SCons.Scanner.IDL
    This module implements the depenency scanner for IDL (Interface Definition Language) files.
    (Section 25, p. 356)
  - **LaTeX**: SCons.Scanner.LaTeX
    This module implements the dependency scanner for LaTeX code.
    (Section 26, p. 357)
  - **Prog** *(Section 27, p. 364)*
  - **RC**: SCons.Scanner.RC
    This module implements the depenency scanner for RC (Interface Definition Language) files.
    (Section 28, p. 365)
- **Script**: SCons.Script
  This file implements the main() function used by the scons script.
  (Section 29, p. 366)
  - **Interactive**: SCons interactive mode
    (Section 30, p. 373)
  - **Main**: SCons.Script
    This file implements the main() function used by the scons script.
    (Section 31, p. 377)
  - **SConscript'**: SCons.Script.SConscript
    This module defines the Python API provided to SConscript and SConstruct files.
    (Section 32, p. 404)

- **Sig**: Place-holder for the old SCons.Sig module hierarchy
  This is no longer used, but code out there (such as the NSIS module on the SCons wiki) may try to import SCons.Sig.
  (Section 33, p. 420)
- **Subst**: SCons.Subst
  SCons string substitution.
  (Section 34, p. 424)
- **Taskmaster**: Generic Taskmaster module for the SCons build engine.
  (Section 35, p. 438)
- **Util**: SCons.Util
  Various utility functions go here.
  (Section 36, p. 459)
- **Variables**: engine.SCons.Variables
  This file defines the Variables class that is used to add user-friendly customizable variables to an SCons build.
  (Section 37, p. 488)
  - **BoolVariable'**: engine.SCons.Variables.BoolVariable
    This file defines the option type for SCons implementing true/false values.
    (Section 38, p. 492)
  - **EnumVariable'**: engine.SCons.Variables.EnumVariable
    This file defines the option type for SCons allowing only specified input-values.
    (Section 39, p. 493)
  - **ListVariable'**: engine.SCons.Variables.ListVariable
    This file defines the option type for SCons implementing 'lists'.
    (Section 40, p. 494)
  - **PackageVariable'**: engine.SCons.Variables.PackageVariable
    This file defines the option type for SCons implementing 'package activation'.
    (Section 41, p. 495)
  - **PathVariable'**: SCons.Variables.PathVariable
    This file defines an option type for SCons implementing path settings.
    (Section 42, p. 496)
- **Warnings**: SCons.Warnings
  This file implements the warnings framework for SCons.
  (Section 43, p. 498)
- **compat**: SCons compatibility package for old Python versions
  This subpackage holds modules that provide backwards-compatible implementations of various things that we'd like to use in SCons but which only show up in later versions of Python than the early, old version(s) we still support.
  (Section 44, p. 567)
  - **_scons_builtins**: Compatibility idioms for builtins names
    This module adds names to the builtins module for things that we want to use in SCons but which don't show up until later Python versions than the earliest ones we support.
    (Section 45, p. 569)
  - **_scons_collections**: collections compatibility module for older (pre-2.4) Python versions
    This does not not NOT (repeat, *NOT*) provide complete collections functionality.
    (Section 46, p. 572)
  - **_scons_dbm**: dbm compatibility module for Python versions that don't have dbm.
    (Section 47, p. 573)
  - **_scons_hashlib**: hashlib backwards-compatibility module for older (pre-2.5) Python versions
    This does not not NOT (repeat, *NOT*) provide complete hashlib functionality.
    (Section 48, p. 576)

  - **_scons_io**: io compatibility module for older (pre-2.6) Python versions
    This does not not NOT (repeat, *NOT*) provide complete io functionality.
    (Section 49, p. 580)
  - **_scons_sets**: Classes to represent arbitrary sets (including sets of sets).
    (Section 50, p. 581)
  - **_scons_subprocess**: subprocess - Subprocesses with accessible I/O streams
    This module allows you to spawn processes, connect to their input/output/error pipes, and obtain their return codes.
    (Section 51, p. 594)
- **cpp**: SCons C Pre-Processor module
  (Section 52, p. 605)
- **dblite** *(Section 53, p. 616)*
- **exitfuncs**: SCons.exitfuncs
  Register functions which are executed when SCons exits for any reason.
  (Section 54, p. 618)

1.2 Variables

Name	Description
__build__	**Value:** `'r5023'`
__buildsys__	**Value:** `'scons-dev'`
__developer__	**Value:** `'scons'`
__revision__	**Value:** `'src/engine/SCons/__init__.py 5023 2010/06/14 22:05:46 sc...`

2 Module SCons.Action

```
SCons.Action

This encapsulates information about executing any sort of action that
can build one or more target Nodes (typically files) from one or more
source Nodes (also typically files) given a specific Environment.

The base class here is ActionBase.  The base class supplies just a few
OO utility methods and some generic methods for displaying information
about an Action in response to the various commands that control printing.

A second-level base class is _ActionAction.  This extends ActionBase
by providing the methods that can be used to show and perform an
action.  True Action objects will subclass _ActionAction; Action
factory class objects will subclass ActionBase.

The heavy lifting is handled by subclasses for the different types of
actions we might execute:

    CommandAction
    CommandGeneratorAction
    FunctionAction
    ListAction

The subclasses supply the following public interface methods used by
other modules:

    __call__()
        THE public interface, "calling" an Action object executes the
        command or Python function.  This also takes care of printing
        a pre-substitution command for debugging purposes.

    get_contents()
        Fetches the "contents" of an Action for signature calculation
        plus the varlist.  This is what gets MD5 checksummed to decide
        if a target needs to be rebuilt because its action changed.

    genstring()
        Returns a string representation of the Action *without*
        command substitution, but allows a CommandGeneratorAction to
        generate the right action based on the specified target,
        source and env.  This is used by the Signature subsystem
        (through the Executor) to obtain an (imprecise) representation
        of the Action operation for informative purposes.


Subclasses also supply the following methods for internal use within
this module:

    __str__()
```

```
        Returns a string approximation of the Action; no variable
        substitution is performed.

    execute()
        The internal method that really, truly, actually handles the
        execution of a command or Python function.  This is used so
        that the __call__() methods can take care of displaying any
        pre-substitution representations, and *then* execute an action
        without worrying about the specific Actions involved.

    get_presig()
        Fetches the "contents" of a subclass for signature calculation.
        The varlist is added to this to produce the Action's contents.

    strfunction()
        Returns a substituted string representation of the Action.
        This is used by the _ActionAction.show() command to display the
        command/function that will be executed to generate the target(s).

There is a related independent ActionCaller class that looks like a
regular Action, and which serves as a wrapper for arbitrary functions
that we want to let the user specify the arguments to now, but actually
execute later (when an out-of-date check determines that it's needed to
be executed, for example).  Objects of this class are returned by an
ActionFactory class that provides a __call__() method as a convenient
way for wrapping up the functions.
```

2.1 Functions

rfile(*n*)

default_exitstatfunc(*s*)

remove_set_lineno_codes(*x*)

Action(*act*, **args*, ***kw*)

```
A factory for action objects.
```

get_default_ENV(*env*)

2.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Action.py 5023 2010/06/14 22:05:46 scons'
print_actions	**Value:** 1
execute_actions	**Value:** 1

continued on next page

Name	Description
print_actions_presub	**Value:** `0`
SET_LINENO	**Value:** `dis.SET_LINENO`
HAVE_ARGUMENT	**Value:** `dis.HAVE_ARGUMENT`
strip_quotes	**Value:** `re.compile(r'^[\'"](.*)[\'"]$')`
default_ENV	**Value:** `False`

2.3 Class ActionBase

object
└ **SCons.Action.ActionBase**

Known Subclasses: SCons.Action._ActionAction, SCons.Action.CommandGeneratorAction, SCons.Action.ListAction

```
Base class for all types of action objects that can be held by
other objects (Builders, Executors, etc.)  This provides the
common methods for manipulating and combining those actions.
```

2.3.1 Methods

__cmp__(*self*, *other*)

no_batch_key(*self*, *env*, *target*, *source*)

batch_key(*self*, *env*, *target*, *source*)

genstring(*self*, *target*, *source*, *env*)

get_contents(*self*, *target*, *source*, *env*)

__add__(*self*, *other*)

__radd__(*self*, *other*)

presub_lines(*self*, *env*)

get_varlist(*self*, *target*, *source*, *env*, *executor*=`False`)

get_targets(*self*, *env*, *executor*)

```
Returns the type of targets ($TARGETS, $CHANGED_TARGETS) used
by this action.
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

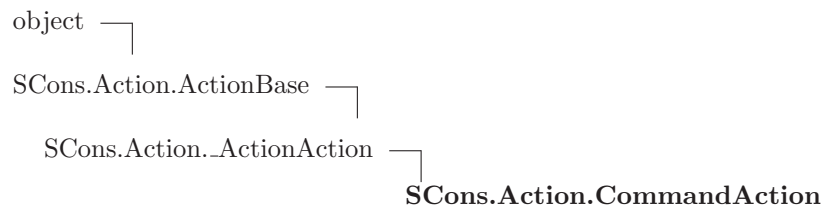
__str__(*x*)

```
str(x)
```

2.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

2.4 Class CommandAction



Known Subclasses: SCons.Action.LazyAction

```
Class for command-execution actions.
```

2.4.1 Methods

__**init**__(*self*, *cmd*, ***kw*)
Overrides: SCons.Action._ActionAction.__init__

__**str**__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

process(*self*, *target*, *source*, *env*, *executor*=`False`)

strfunction(*self*, *target*, *source*, *env*, *executor*=`False`)

execute(*self*, *target*, *source*, *env*, *executor*=`False`)

```
Execute a command action.

This will handle lists of commands as well as individual commands,
because construction variable substitution may turn a single
"command" into a list.  This means that this class can actually
handle lists of commands, even though that's not how we use it
externally.
```

get_presig(*self*, *target*, *source*, *env*, *executor*=`False`)

```
Return the signature contents of this action's command line.

This strips $(-$) and everything in between the string,
since those parts don't affect signatures.
```

get_implicit_deps(*self*, *target*, *source*, *env*, *executor*=`False`)

__**add**__(*self*, *other*)

__call__(*self*, *target*, *source*, *env*, *exitstatfunc*=<class 'SCons.Action._null'>, *presub*=<class 'SCons.Action._null'>, *show*=<class 'SCons.Action._null'>, *execute*=<class 'SCons.Action._null'>, *chdir*=<class 'SCons.Action._null'>, *executor*=False)

__cmp__(*self*, *other*)

__delattr__(...)

x.__delattr__('name') <==> del x.name

__getattribute__(...)

x.__getattribute__('name') <==> x.name

__hash__(*x*)

hash(x)

__new__(*T*, *S*, ...)

Return Value

a new object with type S, a subtype of T

__radd__(*self*, *other*)

__reduce__(...)

helper for pickle

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

batch_key(*self*, *env*, *target*, *source*)

genstring(*self*, *target*, *source*, *env*)

get_contents(*self*, *target*, *source*, *env*)

get_targets(*self*, *env*, *executor*)

```
Returns the type of targets ($TARGETS, $CHANGED_TARGETS) used
by this action.
```

get_varlist(*self*, *target*, *source*, *env*, *executor*=`False`)

no_batch_key(*self*, *env*, *target*, *source*)

presub_lines(*self*, *env*)

print_cmd_line(*self*, *s*, *target*, *source*, *env*)

2.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

2.5 Class CommandGeneratorAction

object
└ SCons.Action.ActionBase
  └ **SCons.Action.CommandGeneratorAction**

Known Subclasses: SCons.Action.LazyAction

```
Class for command-generator actions.
```

2.5.1 Methods

__init__(*self*, *generator*, *kw*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

__str__(*self*)
`str(x)`
Overrides: object.__str__ extit(inherited documentation)

batch_key(*self*, *env*, *target*, *source*)
Overrides: SCons.Action.ActionBase.batch_key

genstring(*self*, *target*, *source*, *env*, *executor*=`False`)
Overrides: SCons.Action.ActionBase.genstring

__call__(*self*, *target*, *source*, *env*, *exitstatfunc*=<class 'SCons.Action._null'>, *presub*=<class 'SCons.Action._null'>, *show*=<class 'SCons.Action._null'>, *execute*=<class 'SCons.Action._null'>, *chdir*=<class 'SCons.Action._null'>, *executor*=False)

get_presig(*self*, *target*, *source*, *env*, *executor*=False)

Return the signature contents of this action's command line.

This strips $(-$) and everything in between the string,
since those parts don't affect signatures.

get_implicit_deps(*self*, *target*, *source*, *env*, *executor*=False)

get_varlist(*self*, *target*, *source*, *env*, *executor*=False)
Overrides: SCons.Action.ActionBase.get_varlist

get_targets(*self*, *env*, *executor*)

Returns the type of targets ($TARGETS, $CHANGED_TARGETS) used
by this action.

Overrides: SCons.Action.ActionBase.get_targets extit(inherited documentation)

__add__(*self*, *other*)

__cmp__(*self*, *other*)

__delattr__(...)

x.__delattr__('name') <==> del x.name

__getattribute__(...)

x.__getattribute__('name') <==> x.name

__hash__(*x*)

hash(x)

__new__(*T*, *S*, ...)

Return Value

a new object with type S, a subtype of T

__radd__(*self*, *other*)

__reduce__(...)

helper for pickle

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

get_contents(*self*, *target*, *source*, *env*)

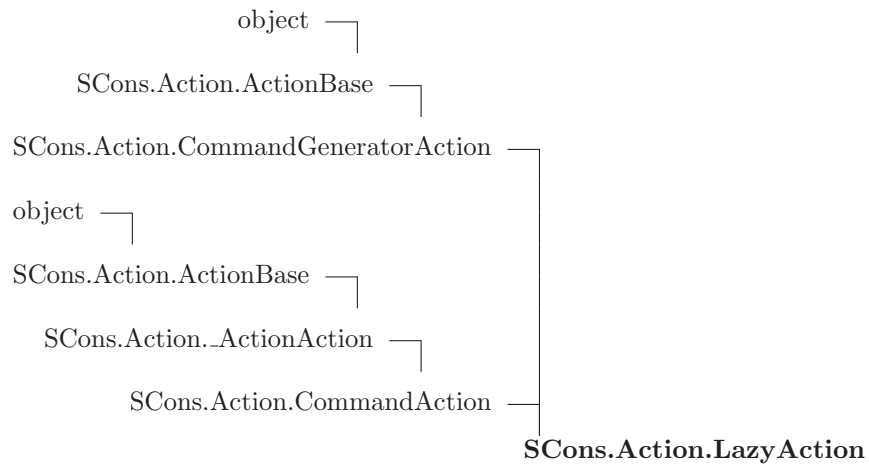
no_batch_key(*self*, *env*, *target*, *source*)

presub_lines(*self*, *env*)

2.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

2.6 Class LazyAction



2.6.1 Methods

__init__(*self*, *var*, *kw*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: SCons.Action.CommandGeneratorAction.__init__

get_parent_class(*self*, *env*)

__call__(*self*, *target*, *source*, *env*, **args*, ***kw*)
Overrides: SCons.Action.CommandGeneratorAction.__call__

get_presig(*self*, *target*, *source*, *env*)
```
Return the signature contents of this action's command line.

This strips $(-$) and everything in between the string,
since those parts don't affect signatures.
```
Overrides: SCons.Action.CommandGeneratorAction.get_presig extit(inherited documentation)

get_varlist(*self*, *target*, *source*, *env*, *executor*=`False`)
Overrides: SCons.Action.CommandGeneratorAction.get_varlist

__add__(*self*, *other*)

__cmp__(*self*, *other*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__radd__(*self*, *other*)

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

batch_key(*self*, *env*, *target*, *source*)
Overrides: SCons.Action.ActionBase.batch_key

execute(*self*, *target*, *source*, *env*, *executor*=`False`)

```
Execute a command action.

This will handle lists of commands as well as individual commands,
because construction variable substitution may turn a single
"command" into a list.  This means that this class can actually
handle lists of commands, even though that's not how we use it
externally.
```

genstring(*self*, *target*, *source*, *env*, *executor*=`False`)
Overrides: SCons.Action.ActionBase.genstring

get_contents(*self*, *target*, *source*, *env*)

get_implicit_deps(*self*, *target*, *source*, *env*, *executor*=`False`)

get_targets(*self*, *env*, *executor*)

```
Returns the type of targets ($TARGETS, $CHANGED_TARGETS) used
by this action.
```

Overrides: SCons.Action.ActionBase.get_targets extit(inherited documentation)

no_batch_key(*self*, *env*, *target*, *source*)

presub_lines(*self*, *env*)

print_cmd_line(*self*, *s*, *target*, *source*, *env*)

process(*self*, *target*, *source*, *env*, *executor*=`False`)

strfunction(*self*, *target*, *source*, *env*, *executor*=`False`)

2.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

2.7 Class FunctionAction

object
SCons.Action.ActionBase
SCons.Action._ActionAction
SCons.Action.FunctionAction

Class for Python function actions.

2.7.1 Methods

__init__(*self*, *execfunction*, *kw*)
Overrides: SCons.Action._ActionAction.__init__

function_name(*self*)

strfunction(*self*, *target*, *source*, *env*, *executor*=False)

__str__(*self*)
str(x)
Overrides: object.__str__ extit(inherited documentation)

execute(*self*, *target*, *source*, *env*, *executor*=False)

get_presig(*self*, *target*, *source*, *env*)

Return the signature contents of this callable action.

get_implicit_deps(*self*, *target*, *source*, *env*)

__add__(*self*, *other*)

__call__(*self*, *target*, *source*, *env*, *exitstatfunc*=<class 'SCons.Action._null'>, *presub*=<class 'SCons.Action._null'>, *show*=<class 'SCons.Action._null'>, *execute*=<class 'SCons.Action._null'>, *chdir*=<class 'SCons.Action._null'>, *executor*=False)

__cmp__(*self*, *other*)

__delattr__(*...*)

x.__delattr__('name') <==> del x.name

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__radd__(*self*, *other*)

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

batch_key(*self*, *env*, *target*, *source*)

genstring(*self*, *target*, *source*, *env*)

get_contents(*self*, *target*, *source*, *env*)

get_targets(*self*, *env*, *executor*)

```
Returns the type of targets ($TARGETS, $CHANGED_TARGETS) used
by this action.
```

get_varlist(*self*, *target*, *source*, *env*, *executor*=`False`)

no_batch_key(*self*, *env*, *target*, *source*)

presub_lines(*self*, *env*)

print_cmd_line(*self*, *s*, *target*, *source*, *env*)

2.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

2.8 Class ListAction

object

SCons.Action.ActionBase

SCons.Action.ListAction

```
Class for lists of other actions.
```

2.8.1 Methods

__init__(*self*, *actionlist*)
```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```
Overrides: object.__init__ extit(inherited documentation)

genstring(*self*, *target*, *source*, *env*)
Overrides: SCons.Action.ActionBase.genstring

__str__(*self*)
```
str(x)
```
Overrides: object.__str__ extit(inherited documentation)

presub_lines(*self*, *env*)
Overrides: SCons.Action.ActionBase.presub_lines

get_presig(*self*, *target*, *source*, *env*)

```
Return the signature contents of this action list.

Simple concatenation of the signatures of the elements.
```

__call__(*self*, *target*, *source*, *env*, *exitstatfunc*=<class 'SCons.Action._null'>, *presub*=<class 'SCons.Action._null'>, *show*=<class 'SCons.Action._null'>, *execute*=<class 'SCons.Action._null'>, *chdir*=<class 'SCons.Action._null'>, *executor*=False)

get_implicit_deps(*self*, *target*, *source*, *env*)

get_varlist(*self*, *target*, *source*, *env*, *executor*=False)
Overrides: SCons.Action.ActionBase.get_varlist

__add__(*self*, *other*)

__cmp__(*self*, *other*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__radd__(*self*, *other*)

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

batch_key(*self*, *env*, *target*, *source*)

get_contents(*self*, *target*, *source*, *env*)

get_targets(*self*, *env*, *executor*)

```
Returns the type of targets ($TARGETS, $CHANGED_TARGETS) used
by this action.
```

no_batch_key(*self*, *env*, *target*, *source*)

2.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

2.9 Class ActionCaller

object
└ **SCons.Action.ActionCaller**

```
A class for delaying calling an Action function with specific
(positional and keyword) arguments until the Action is actually
executed.

This class looks to the rest of the world like a normal Action object,
but what it's really doing is hanging on to the arguments until we
have a target, source and env to use for the expansion.
```

2.9.1 Methods

__init__(*self*, *parent*, *args*, *kw*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

get_contents(*self*, *target*, *source*, *env*)

subst(*self*, *s*, *target*, *source*, *env*)

subst_args(*self*, *target*, *source*, *env*)

subst_kw(*self*, *target*, *source*, *env*)

__call__(*self*, *target*, *source*, *env*, *executor*=`False`)

strfunction(*self*, *target*, *source*, *env*)

__str__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(x)

```
hash(x)
```

__new__(T, S, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(x)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

2.9.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

2.10 Class ActionFactory

object
└ **SCons.Action.ActionFactory**

```
A factory class that will wrap up an arbitrary function
as an SCons-executable Action object.

The real heavy lifting here is done by the ActionCaller class.
We just collect the (positional and keyword) arguments that we're
called with and give them to the ActionCaller object we create,
so it can hang onto them until it needs them.
```

2.10.1 Methods

__init__(*self*, *actfunc*, *strfunc*, *convert*=<function <lambda> at 0x843cd14>)
x.__init__(...) initializes x; see x.__class__.__doc__ for signature

Overrides: object.__init__ extit(inherited documentation)

__call__(*self*, **args*, ***kw*)

__delattr__(...)

x.__delattr__('name') <==> del x.name

__getattribute__(...)

x.__getattribute__('name') <==> x.name

__hash__(*x*)

hash(x)

__new__(*T*, *S*, ...)

Return Value

a new object with type S, a subtype of T

__reduce__(...)

helper for pickle

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

__str__(*x*)

str(x)

2.10.2 Properties

continued on next page

Name	Description

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

3 Module SCons.Builder

```
SCons.Builder

Builder object subsystem.

A Builder object is a callable that encapsulates information about how
to execute actions to create a target Node (file) from source Nodes
(files), and how to create those dependencies for tracking.

The main entry point here is the Builder() factory method.  This provides
a procedural interface that creates the right underlying Builder object
based on the keyword arguments supplied and the types of the arguments.

The goal is for this external interface to be simple enough that the
vast majority of users can create new Builders as necessary to support
building new types of files in their configurations, without having to
dive any deeper into this subsystem.

The base class here is BuilderBase.  This is a concrete base class which
does, in fact, represent the Builder objects that we (or users) create.

There is also a proxy that looks like a Builder:

    CompositeBuilder

        This proxies for a Builder with an action that is actually a
        dictionary that knows how to map file suffixes to a specific
        action.  This is so that we can invoke different actions
        (compilers, compile options) for different flavors of source
        files.

Builders and their proxies have the following public interface methods
used by other modules:

    __call__()
        THE public interface.  Calling a Builder object (with the
        use of internal helper methods) sets up the target and source
        dependencies, appropriate mapping to a specific action, and the
        environment manipulation necessary for overridden construction
        variable.  This also takes care of warning about possible mistakes
        in keyword arguments.

    add_emitter()
        Adds an emitter for a specific file suffix, used by some Tool
        modules to specify that (for example) a yacc invocation on a .y
        can create a .h *and* a .c file.

    add_action()
        Adds an action for a specific file suffix, heavily used by
        Tool modules to add their specific action(s) for turning
```

```
        a source file into an object file to the global static
        and shared object file Builders.

There are the following methods for internal use within this module:

    _execute()
        The internal method that handles the heavily lifting when a
        Builder is called.  This is used so that the __call__() methods
        can set up warning about possible mistakes in keyword-argument
        overrides, and *then* execute all of the steps necessary so that
        the warnings only occur once.

    get_name()
        Returns the Builder's name within a specific Environment,
        primarily used to try to return helpful information in error
        messages.

    adjust_suffix()
    get_prefix()
    get_suffix()
    get_src_suffix()
    set_src_suffix()
        Miscellaneous stuff for handling the prefix and suffix
        manipulation we use in turning source file names into target
        file names.
```

3.1 Functions

match_splitext(*path*, *suffixes*=[])

Builder(***kw*)

```
A factory for builder objects.
```

is_a_Builder(*obj*)

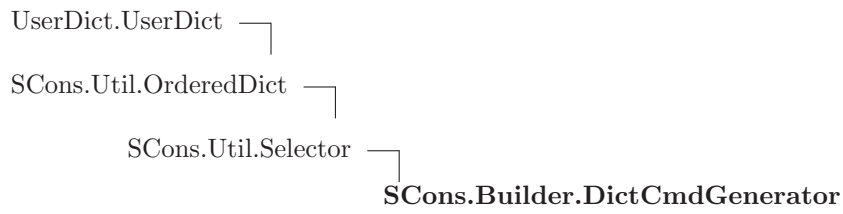
```
"Returns True iff the specified obj is one of our Builder classes.

The test is complicated a bit by the fact that CompositeBuilder
is a proxy, not a subclass of BuilderBase.
```

3.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Builder.py 5023 2010/06/14 22:05:46 scons'
misleading_keywords	**Value:** {'sources': 'source', 'targets': 'target'}

3.3 Class DictCmdGenerator




```
This is a callable class that can be used as a
command generator function.  It holds on to a dictionary
mapping file suffixes to Actions.  It uses that dictionary
to return the proper action based on the file suffix of
the source file.
```

3.3.1 Methods

__init__(*self*, *dict*=`False`, *source_ext_match*=`1`)
Overrides: SCons.Util.OrderedDict.__init__

src_suffixes(*self*)

add_action(*self*, *suffix*, *action*)

```
Add a suffix-action pair to the mapping.
```

__call__(*self*, *target*, *source*, *env*, *for_signature*)
Overrides: SCons.Util.Selector.__call__

__cmp__(*self*, *dict*)

__contains__(*self*, *key*)

__delitem__(*self*, *key*)
Overrides: UserDict.UserDict.__delitem__

__getitem__(*self*, *key*)

__len__(*self*)

__repr__(*self*)

__setitem__(*self*, *key*, *item*)
Overrides: UserDict.UserDict.__setitem__

clear(*self*)
Overrides: UserDict.UserDict.clear

copy(*self*)
Overrides: UserDict.UserDict.copy

fromkeys(*cls*, *iterable*, *value*=`False`)

get(*self*, *key*, *failobj*=`False`)

has_key(*self*, *key*)

items(*self*)
Overrides: UserDict.UserDict.items

iteritems(*self*)

iterkeys(*self*)

itervalues(*self*)

keys(*self*)
Overrides: UserDict.UserDict.keys

pop(*self*, *key*, **args*)

popitem(*self*)
Overrides: UserDict.UserDict.popitem

setdefault(*self*, *key*, *failobj*=`False`)
Overrides: UserDict.UserDict.setdefault

update(*self*, *dict*)
Overrides: UserDict.UserDict.update

values(*self*)
Overrides: UserDict.UserDict.values

3.4 Class CallableSelector

UserDict.UserDict
SCons.Util.OrderedDict
SCons.Util.Selector
SCons.Builder.CallableSelector

```
A callable dictionary that will, in turn, call the value it
finds if it can.
```

3.4.1 Methods

__call__(*self*, *env*, *source*)
Overrides: SCons.Util.Selector.__call__

__cmp__(*self*, *dict*)

__contains__(*self*, *key*)

__delitem__(*self*, *key*)
Overrides: UserDict.UserDict.__delitem__

__getitem__(*self*, *key*)

__init__(*self*, *dict*=`False`)
Overrides: UserDict.UserDict.__init__

__len__(*self*)

__repr__(*self*)

__setitem__(*self*, *key*, *item*)
Overrides: UserDict.UserDict.__setitem__

clear(*self*)
Overrides: UserDict.UserDict.clear

copy(*self*)
Overrides: UserDict.UserDict.copy

fromkeys(*cls*, *iterable*, *value*=`False`)

get(*self*, *key*, *failobj*=`False`)

has_key(*self*, *key*)

items(*self*)
Overrides: UserDict.UserDict.items

iteritems(*self*)

iterkeys(*self*)

itervalues(*self*)

keys(*self*)
Overrides: UserDict.UserDict.keys

pop(*self*, *key*, **args*)

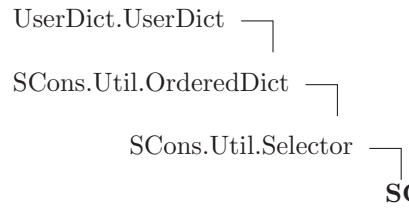
popitem(*self*)
Overrides: UserDict.UserDict.popitem

setdefault(*self*, *key*, *failobj*=`False`)
Overrides: UserDict.UserDict.setdefault

update(*self*, *dict*)
Overrides: UserDict.UserDict.update

values(*self*)
Overrides: UserDict.UserDict.values

3.5 Class DictEmitter




```
A callable dictionary that maps file suffixes to emitters.
When called, it finds the right emitter in its dictionary for the
suffix of the first source file, and calls that emitter to get the
right lists of targets and sources to return.  If there's no emitter
for the suffix in its dictionary, the original target and source are
returned.
```

3.5.1 Methods

__call__(*self*, *target*, *source*, *env*)
Overrides: SCons.Util.Selector.__call__

__cmp__(*self*, *dict*)

__contains__(*self*, *key*)

__delitem__(*self*, *key*)
Overrides: UserDict.UserDict.__delitem__

__getitem__(*self*, *key*)

__init__(*self*, *dict*=`False`)
Overrides: UserDict.UserDict.__init__

__len__(*self*)

__repr__(*self*)

__setitem__(*self*, *key*, *item*)
Overrides: UserDict.UserDict.__setitem__

clear(*self*)
Overrides: UserDict.UserDict.clear

copy(*self*)
Overrides: UserDict.UserDict.copy

fromkeys(*cls*, *iterable*, *value*=`False`)

get(*self*, *key*, *failobj*=`False`)

has_key(*self*, *key*)

items(*self*)
Overrides: UserDict.UserDict.items

iteritems(*self*)

iterkeys(*self*)

itervalues(*self*)

keys(*self*)
Overrides: UserDict.UserDict.keys

pop(*self*, *key*, **args*)

popitem(*self*)
Overrides: UserDict.UserDict.popitem

setdefault(*self*, *key*, *failobj*=`False`)
Overrides: UserDict.UserDict.setdefault

update(*self*, *dict*)
Overrides: UserDict.UserDict.update

values(*self*)
Overrides: UserDict.UserDict.values

3.6 Class ListEmitter

```
A callable list of emitters that calls each in sequence,
returning the result.
```

3.6.1 Methods

__call__(*self*, *target*, *source*, *env*)

__add__(*self*, *other*)

__cmp__(*self*, *other*)

__contains__(*self*, *item*)

__delitem__(*self*, *i*)

__delslice__(*self*, *i*, *j*)

__eq__(*self*, *other*)

__ge__(*self*, *other*)

__getitem__(*self*, *i*)

__getslice__(*self*, *i*, *j*)

__gt__(*self*, *other*)

__iadd__(*self*, *other*)

__imul__(*self*, *n*)

__init__(*self*, *initlist*=`False`)

__le__(*self*, *other*)

__len__(*self*)

__lt__(*self*, *other*)

__mul__(*self*, *n*)

__ne__(*self*, *other*)

__radd__(*self*, *other*)

__repr__(*self*)

__**rmul**__(*self*, *n*)

__**setitem**__(*self*, *i*, *item*)

__**setslice**__(*self*, *i*, *j*, *other*)

append(*self*, *item*)

count(*self*, *item*)

extend(*self*, *other*)

index(*self*, *item*, **args*)

insert(*self*, *i*, *item*)

pop(*self*, *i*=-1)

remove(*self*, *item*)

reverse(*self*)

sort(*self*, **args*, ***kwds*)

3.7 Class OverrideWarner

UserDict.UserDict
└
SCons.Builder.OverrideWarner

```
A class for warning about keyword arguments that we use as
overrides in a Builder call.

This class exists to handle the fact that a single Builder call
can actually invoke multiple builders.  This class only emits the
warnings once, no matter how many Builders are invoked.
```

3.7.1 Methods

__**init**__(*self*, *dict*)
Overrides: UserDict.UserDict.__init__

warn(*self*)

__**cmp**__(*self*, *dict*)

__**contains**__(*self*, *key*)

__**delitem**__(*self*, *key*)

__**getitem**__(*self*, *key*)

__**len**__(*self*)

__**repr**__(*self*)

__**setitem**__(*self*, *key*, *item*)

clear(*self*)

copy(*self*)

fromkeys(*cls*, *iterable*, *value*=`False`)

get(*self*, *key*, *failobj*=`False`)

has_key(*self*, *key*)

items(*self*)

iteritems(*self*)

iterkeys(*self*)

itervalues(*self*)

keys(*self*)

pop(*self*, *key*, **args*)

popitem(*self*)

setdefault(*self*, *key*, *failobj*=`False`)

update(*self*, *dict*=`False`, ***kwargs*)

values(*self*)

3.8 Class EmitterProxy

object
└ **SCons.Builder.EmitterProxy**

```
This is a callable class that can act as a
Builder emitter.  It holds on to a string that
is a key into an Environment dictionary, and will
look there at actual build time to see if it holds
a callable.  If so, we will call that as the actual
emitter.
```

3.8.1 Methods

__init__(*self*, *var*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__call__(*self*, *target*, *source*, *env*)

__cmp__(*self*, *other*)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

`helper for pickle`

__reduce_ex__(*...*)

`helper for pickle`

__repr__(*x*)

`repr(x)`

__setattr__(*...*)

`x.__setattr__('name', value) <==> x.name = value`

__str__(*x*)

```
str(x)
```

3.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

3.9 Class BuilderBase

object
└ **SCons.Builder.BuilderBase**

```
Base class for Builders, objects that create output
nodes (files) from input nodes (files).
```

3.9.1 Methods

__init__(*self*, *action*=False, *prefix*='', *suffix*='', *src_suffix*='', *target_factory*=False, *source_factory*=False, *target_scanner*=False, *source_scanner*=False, *emitter*=False, *multi*=0, *env*=False, *single_source*=0, *name*=False, *chdir*=<class 'SCons.Builder._Null'>, *is_explicit*=1, *src_builder*=False, *ensure_suffix*=False, ***overrides*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__nonzero__(*self*)

get_name(*self*, *env*)

```
Attempts to get the name of the Builder.

Look at the BUILDERS variable of env, expecting it to be a
dictionary containing this Builder, and return the key of the
dictionary.  If there's no key, then return a directly-configured
name (if there is one) or the name of the class (by default).
```

__cmp__(*self*, *other*)

splitext(*self*, *path*, *env*=False)

__call__(*self*, *env*, *target*=False, *source*=False, *chdir*=<class 'SCons.Builder._Null'>, ***kw*)

adjust_suffix(*self*, *suff*)

get_prefix(*self*, *env*, *sources*=[])

set_suffix(*self*, *suffix*)

get_suffix(*self*, *env*, *sources*=[])

set_src_suffix(*self*, *src_suffix*)

get_src_suffix(*self*, *env*)

Get the first src_suffix in the list of src_suffixes.

add_emitter(*self*, *suffix*, *emitter*)

Add a suffix-emitter mapping to this Builder.

This assumes that emitter has been initialized with an
appropriate dictionary type, and will throw a TypeError if
not, so the caller is responsible for knowing that this is an
appropriate method to call for the Builder in question.

add_src_builder(*self*, *builder*)

Add a new Builder to the list of src_builders.

This requires wiping out cached values so that the computed
lists of source suffixes get re-calculated.

src_builder_sources(*self*, *env*, *source*, *overwarn*={})

get_src_builders(*self*, *env*)

Returns the list of source Builders for this Builder.

This exists mainly to look up Builders referenced as
strings in the 'BUILDER' variable of the construction
environment and cache the result.

subst_src_suffixes(*self*, *env*)

The suffix list may contain construction variable expansions,
so we have to evaluate the individual strings. To avoid doing
this over and over, we memoize the results for each construction
environment.

src_suffixes(*self*, *env*)

```
Returns the list of source suffixes for all src_builders of this
Builder.

This is essentially a recursive descent of the src_builder "tree."
(This value isn't cached because there may be changes in a
src_builder many levels deep that we can't see.)
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

3.9.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

3.9.3 Class Variables

Name	Description
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass
memoizer_counters	**Value:** []

3.10 Class CompositeBuilder

object
SCons.Util.Proxy
SCons.Builder.CompositeBuilder

```
A Builder Proxy whose main purpose is to always have
a DictCmdGenerator as its action, and to provide access
to the DictCmdGenerator's add_action() method.
```

3.10.1 Methods

__init__(*self*, *builder*, *cmdgen*)
Wrap an object as a Proxy object

Overrides: SCons.Util.Proxy.__init__ extit(inherited documentation)

__call__(*...*)

```
A Python Descriptor class that delegates attribute fetches
to an underlying wrapped subject of a Proxy.  Typical use:

    class Foo(Proxy):
        __str__ = Delegate('__str__')
```

add_action(*self*, *suffix*, *action*)

__cmp__(*self*, *other*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattr__(*self*, *name*)

```
Retrieve an attribute from the wrapped object.  If the named
attribute doesn't exist, AttributeError is raised
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

get(*self*)

```
Retrieve the entire wrapped object
```

3.10.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

4 Module SCons.CacheDir

CacheDir support

4.1 Functions

CacheRetrieveFunc(*target*, *source*, *env*)

CacheRetrieveString(*target*, *source*, *env*)

CachePushFunc(*target*, *source*, *env*)

4.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/CacheDir.py 5023 2010/06/14 22:05:46 sc...
__doc__	**Value:** ...
cache_enabled	**Value:** True
cache_debug	**Value:** False
cache_force	**Value:** False
cache_show	**Value:** False
CacheRetrieve	**Value:** SCons.Action.Action(CacheRetrieveFunc, CacheRetrieveString)
CacheRetrieveSilent	**Value:** SCons.Action.Action(CacheRetrieveFunc, None)
CachePush	**Value:** SCons.Action.Action(CachePushFunc, None)

4.3 Class CacheDir

object
└ **SCons.CacheDir.CacheDir**

4.3.1 Methods

__init__(*self*, *path*)
x.__init__(...) initializes x; see x.__class__.__doc__ for signature

Overrides: object.__init__ extit(inherited documentation)

CacheDebug(*self*, *fmt*, *target*, *cachefile*)

is_enabled(*self*)

cachepath(*self*, *node*)

retrieve(*self*, *node*)

```
This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff in
built().

Note that there's a special trick here with the execute flag
(one that's not normally done for other actions).  Basically
if the user requested a no_exec (-n) build, then
SCons.Action.execute_actions is set to 0 and when any action
is called, it does its showing but then just returns zero
instead of actually calling the action execution operation.
The problem for caching is that if the file does NOT exist in
cache then the CacheRetrieveString won't return anything to
show for the task, but the Action.__call__ won't call
CacheRetrieveFunc; instead it just returns zero, which makes
the code below think that the file *was* successfully
retrieved from the cache, therefore it doesn't do any
subsequent building.  However, the CacheRetrieveString didn't
print anything because it didn't actually exist in the cache,
and no more build actions will be performed, so the user just
sees nothing.  The fix is to tell Action.__call__ to always
execute the CacheRetrieveFunc and then have the latter
explicitly check SCons.Action.execute_actions itself.
```

push(*self*, *node*)

push_if_forced(*self*, *node*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

helper for pickle

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

__str__(*x*)

str(x)

4.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

5 Module SCons.Conftest

```
SCons.Conftest

Autoconf-like configuration support; low level implementation of tests.
```

5.1 Functions

CheckBuilder(*context*, *text*=False, *language*=False)

```
Configure check to see if the compiler works.
Note that this uses the current value of compiler and linker flags, make
sure $CFLAGS, $CPPFLAGS and $LIBS are set correctly.
"language" should be "C" or "C++" and is used to select the compiler.
Default is "C".
"text" may be used to specify the code to be build.
Returns an empty string for success, an error message for failure.
```

CheckCC(*context*)

```
Configure check for a working C compiler.

This checks whether the C compiler, as defined in the $CC construction
variable, can compile a C source file. It uses the current $CCCOM value
too, so that it can test against non working flags.
```

CheckSHCC(*context*)

```
Configure check for a working shared C compiler.

This checks whether the C compiler, as defined in the $SHCC construction
variable, can compile a C source file. It uses the current $SHCCCOM value
too, so that it can test against non working flags.
```

CheckCXX(*context*)

```
Configure check for a working CXX compiler.

This checks whether the CXX compiler, as defined in the $CXX construction
variable, can compile a CXX source file. It uses the current $CXXCOM value
too, so that it can test against non working flags.
```

CheckSHCXX(*context*)

```
Configure check for a working shared CXX compiler.

This checks whether the CXX compiler, as defined in the $SHCXX construction
variable, can compile a CXX source file. It uses the current $SHCXXCOM value
too, so that it can test against non working flags.
```

CheckFunc(*context*, *function_name*, *header*=False, *language*=False)

```
Configure check for a function "function_name".
"language" should be "C" or "C++" and is used to select the compiler.
Default is "C".
Optional "header" can be defined to define a function prototype, include a
header file or anything else that comes before main().
Sets HAVE_function_name in context.havedict according to the result.
Note that this uses the current value of compiler and linker flags, make
sure $CFLAGS, $CPPFLAGS and $LIBS are set correctly.
Returns an empty string for success, an error message for failure.
```

CheckHeader(*context*, *header_name*, *header*=False, *language*=False, *include_quotes*=False)

```
Configure check for a C or C++ header file "header_name".
Optional "header" can be defined to do something before including the
header file (unusual, supported for consistency).
"language" should be "C" or "C++" and is used to select the compiler.
Default is "C".
Sets HAVE_header_name in context.havedict according to the result.
Note that this uses the current value of compiler and linker flags, make
sure $CFLAGS and $CPPFLAGS are set correctly.
Returns an empty string for success, an error message for failure.
```

CheckType(*context*, *type_name*, *fallback*=False, *header*=False, *language*=False)

```
Configure check for a C or C++ type "type_name".
Optional "header" can be defined to include a header file.
"language" should be "C" or "C++" and is used to select the compiler.
Default is "C".
Sets HAVE_type_name in context.havedict according to the result.
Note that this uses the current value of compiler and linker flags, make
sure $CFLAGS, $CPPFLAGS and $LIBS are set correctly.
Returns an empty string for success, an error message for failure.
```

CheckTypeSize(*context*, *type_name*, *header*=False, *language*=False, *expect*=False)

```
This check can be used to get the size of a given type, or to check whether
the type is of expected size.

Arguments:
    - type : str
        the type to check
    - includes : sequence
        list of headers to include in the test code before testing the type
    - language : str
        'C' or 'C++'
    - expect : int
        if given, will test wether the type has the given number of bytes.
        If not given, will automatically find the size.

    Returns:
        status : int
            0 if the check failed, or the found size of the type if the check succeeded.
```

CheckDeclaration(*context*, *symbol*, *includes*=False, *language*=False)

```
Checks whether symbol is declared.

Use the same test as autoconf, that is test whether the symbol is defined
as a macro or can be used as an r-value.

Arguments:
    symbol : str
        the symbol to check
    includes : str
        Optional "header" can be defined to include a header file.
    language : str
        only C and C++ supported.

Returns:
    status : bool
        True if the check failed, False if succeeded.
```

CheckLib(*context*, *libs*, *func_name*=False, *header*=False, *extra_libs*=False, *call*=False, *language*=False, *autoadd*=1, *append*=True)

```
Configure check for a C or C++ libraries "libs".  Searches through
the list of libraries, until one is found where the test succeeds.
Tests if "func_name" or "call" exists in the library.  Note: if it exists
in another library the test succeeds anyway!
Optional "header" can be defined to include a header file.  If not given a
default prototype for "func_name" is added.
Optional "extra_libs" is a list of library names to be added after
"lib_name" in the build command.  To be used for libraries that "lib_name"
depends on.
Optional "call" replaces the call to "func_name" in the test code.  It must
consist of complete C statements, including a trailing ";".
Both "func_name" and "call" arguments are optional, and in that case, just
linking against the libs is tested.
"language" should be "C" or "C++" and is used to select the compiler.
Default is "C".
Note that this uses the current value of compiler and linker flags, make
sure $CFLAGS, $CPPFLAGS and $LIBS are set correctly.
Returns an empty string for success, an error message for failure.
```

5.2 Variables

Name	Description
LogInputFiles	**Value:** 1
LogErrorMessages	**Value:** 1

6 Module SCons.Debug

```
SCons.Debug

Code for debugging SCons internal things.  Shouldn't be
needed by most users.
```

6.1 Functions

logInstanceCreation(*instance*, *name*=`False`)

string_to_classes(*s*)

fetchLoggedInstances(*classes*=`'*'`)

countLoggedInstances(*classes*, *file*=`sys.stdout`)

listLoggedInstances(*classes*, *file*=`sys.stdout`)

dumpLoggedInstances(*classes*, *file*=`sys.stdout`)

memory()

caller_stack(**backlist*)

caller_trace(*back*=`0`)

dump_caller_counts(*file*=`sys.stdout`)

func_shorten(*func_tuple*)

Trace(*msg*, *file*=`False`, *mode*=`'w'`, *tstamp*=`False`)

```
Write a trace message to a file.  Whenever a file is specified,
it becomes the default for the next call to Trace().
```

6.2 Variables

Name	Description
__revision__	**Value:** `'src/engine/SCons/Debug.py 5023 2010/06/14 22:05:46 scons'`
tracked_classes	**Value:** `{'Action.CommandAction': [<weakref at 0x875b7d4; to 'Lazy...`
caller_bases	**Value:** {}
caller_dicts	**Value:** {}

continued on next page

Name	Description
shorten_list	**Value:** `[('/scons/SCons/', 1), ('/src/engine/SCons/', 1), ('/usr/...`
TraceFP	**Value:** {}
TraceDefault	**Value:** `'/dev/tty'`
TimeStampDefault	**Value:** `False`
StartTime	**Value:** `1276578476.45`
PreviousTime	**Value:** `1276578476.45`

7 Module SCons.Defaults

```
SCons.Defaults

Builders and other things for the local site.  Here's where we'll
duplicate the functionality of autoconf until we move it into the
installation procedure or use something like qmconf.

The code that reads the registry to find MSVC components was borrowed
from distutils.msvccompiler.
```

7.1 Functions

DefaultEnvironment(**args*, ***kw*)

```
Initial public entry point for creating the default construction
Environment.

After creating the environment, we overwrite our name
(DefaultEnvironment) with the _fetch_DefaultEnvironment() function,
which more efficiently returns the initialized default construction
environment without checking for its existence.

(This function still exists with its _default_check because someone
else (*cough* Script/__init__.py *cough*) may keep a reference
to this function.  So we can't use the fully functional idiom of
having the name originally be a something that *only* creates the
construction environment and then overwrites the name.)
```

StaticObjectEmitter(*target*, *source*, *env*)

SharedObjectEmitter(*target*, *source*, *env*)

SharedFlagChecker(*source*, *target*, *env*)

get_paths_str(*dest*)

chmod_func(*dest*, *mode*)

chmod_strfunc(*dest*, *mode*)

copy_func(*dest*, *src*)

delete_func(*dest*, *must_exist*=0)

delete_strfunc(*dest*, *must_exist*=0)

mkdir_func(*dest*)

move_func(*dest*, *src*)

touch_func(*dest*)

processDefines(*defs*)

process defines, resolving strings, lists, dictionaries, into a list of strings

7.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Defaults.py 5023 2010/06/14 22:05:46 sc...
SharedCheck	**Value:** SCons.Action.Action(SharedFlagChecker, None)
CScan	**Value:** SCons.Tool.CScanner
DScan	**Value:** SCons.Tool.DScanner
LaTeXScan	**Value:** SCons.Tool.LaTeXScanner
ObjSourceScan	**Value:** SCons.Tool.SourceFileScanner
ProgScan	**Value:** SCons.Tool.ProgramScanner
DirScanner	**Value:** SCons.Scanner.Dir.DirScanner()
DirEntryScanner	**Value:** SCons.Scanner.Dir.DirEntryScanner()
CAction	**Value:** SCons.Action.Action("$CCCOM", "$CCCOMSTR")
ShCAction	**Value:** SCons.Action.Action("$SHCCCOM", "$SHCCCOMSTR")
CXXAction	**Value:** SCons.Action.Action("$CXXCOM", "$CXXCOMSTR")
ShCXXAction	**Value:** SCons.Action.Action("$SHCXXCOM", "$SHCXXCOMSTR")
ASAction	**Value:** SCons.Action.Action("$ASCOM", "$ASCOMSTR")
ASPPAction	**Value:** SCons.Action.Action("$ASPPCOM", "$ASPPCOMSTR")
LinkAction	**Value:** SCons.Action.Action("$LINKCOM", "$LINKCOMSTR")
ShLinkAction	**Value:** SCons.Action.Action("$SHLINKCOM", "$SHLINKCOMSTR")
LdModuleLinkAction	**Value:** SCons.Action.Action("$LDMODULECOM", "$LDMODULECOMSTR")
Chmod	**Value:** ActionFactory(chmod_func, chmod_strfunc)
Copy	**Value:** ActionFactory(copy_func, lambda dest, src: 'Copy("%s", "%...
Delete	**Value:** ActionFactory(delete_func, delete_strfunc)
Mkdir	**Value:** ActionFactory(mkdir_func, lambda dir: 'Mkdir(%s)' % get_p...
Move	**Value:** ActionFactory(move_func, lambda dest, src: 'Move("%s", "%...
Touch	**Value:** ActionFactory(touch_func, lambda file: 'Touch(%s)' % get_...
ConstructionEnvironment	**Value:** {'BUILDERS': {}, 'CONFIGUREDIR': '#/.sconf_temp', 'CONFIG...

7.3 Class NullCmdGenerator

object
└ **SCons.Defaults.NullCmdGenerator**

```
This is a callable class that can be used in place of other
command generators if you don't want them to do anything.

The __call__ method for this class simply returns the thing
you instantiated it with.

Example usage:
env["DO_NOTHING"] = NullCmdGenerator
env["LINKCOM"] = "${DO_NOTHING('$LINK $SOURCES $TARGET')}"
```

7.3.1 Methods

__init__(*self*, *cmd*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

__call__(*self*, *target*, *source*, *env*, *for_signature*=`False`)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

7.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

7.4 Class Variable_Method_Caller

object
└ **SCons.Defaults.Variable_Method_Caller**

```
A class for finding a construction variable on the stack and
calling one of its methods.

We use this to support "construction variables" in our string
eval()s that actually stand in for methods--specifically, use
of "RDirs" in call to _concat that should actually execute the
"TARGET.RDirs" method.  (We used to support this by creating a little
"build dictionary" that mapped RDirs to the method, but this got in
the way of Memoizing construction environments, because we had to
create new environment objects to hold the variables.)
```

7.4.1 Methods

__init__(*self*, *variable*, *method*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

__call__(*self*, **args*, ***kw*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__**hash**__(*x*)

```
hash(x)
```

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__**reduce**__(*...*)

```
helper for pickle
```

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__**str**__(*x*)

```
str(x)
```

7.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

8 Module SCons.Environment

```
SCons.Environment

Base class for construction Environments.  These are
the primary objects used to communicate dependency and
construction information to the build engine.

Keyword arguments supplied when the construction Environment
is created are construction variables used to initialize the
Environment
```

8.1 Functions

alias_builder(*env*, *target*, *source*)

apply_tools(*env*, *tools*, *toolpath*)

copy_non_reserved_keywords(*dict*)

is_valid_construction_var(*varstr*)

```
Return if the specified string is a legitimate construction
variable.
```

default_decide_source(*dependency*, *target*, *prev_ni*)

default_decide_target(*dependency*, *target*, *prev_ni*)

default_copy_from_cache(*src*, *dst*)

NoSubstitutionProxy(*subject*)

8.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Environment.py 5023 2010/06/14 22:05:46...
CleanTargets	**Value:** {}
CalculatorArgs	**Value:** {}
AliasBuilder	**Value:** SCons.Builder.Builder(action= alias_builder, target_facto...
reserved_construction_var_names	**Value:** ['CHANGED_SOURCES', 'CHANGED_TARGETS', 'SOURCE', 'SOURCES...
future_reserved_construction_var_names	**Value:** []

8.3 Class MethodWrapper

object
└ **SCons.Environment.MethodWrapper**

Known Subclasses: SCons.Environment.BuilderWrapper

```
A generic Wrapper class that associates a method (which can
actually be any callable) with an object.  As part of creating this
MethodWrapper object an attribute with the specified (by default,
the name of the supplied method) is added to the underlying object.
When that new "method" is called, our __call__() method adds the
object as the first argument, simulating the Python behavior of
supplying "self" on method calls.

We hang on to the name by which the method was added to the underlying
base class so that we can provide a method to "clone" ourselves onto
a new underlying object being copied (without which we wouldn't need
to save that info).
```

8.3.1 Methods

__init__(*self*, *object*, *method*, *name*=False)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__call__(*self*, **args*, ***kwargs*)

clone(*self*, *new_object*)

```
Returns an object that re-binds the underlying "method" to
the specified new object.
```

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__**reduce**__(*...*)

```
helper for pickle
```

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__**str**__(*x*)

```
str(x)
```

8.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

8.4 Class BuilderWrapper

object

SCons.Environment.MethodWrapper

SCons.Environment.BuilderWrapper

```
A MethodWrapper subclass that that associates an environment with
a Builder.

This mainly exists to wrap the __call__() function so that all calls
to Builders can have their argument lists massaged in the same way
(treat a lone argument as the source, treat two arguments as target
then source, make sure both target and source are lists) without
having to have cut-and-paste code to do it.

As a bit of obsessive backwards compatibility, we also intercept
attempts to get or set the "env" or "builder" attributes, which were
```

```
the names we used before we put the common functionality into the
MethodWrapper base class.  We'll keep this around for a while in case
people shipped Tool modules that reached into the wrapper (like the
Tool/qt.py module does, or did).  There shouldn't be a lot attribute
fetching or setting on these, so a little extra work shouldn't hurt.
```

8.4.1 Methods

__call__(*self*, *target*=False, *source*=<class 'SCons.Environment._Null'>, **args*, ***kw*)
Overrides: SCons.Environment.MethodWrapper.__call__

__repr__(*self*)
`repr(x)`

Overrides: object.__repr__ extit(inherited documentation)

__str__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

__getattr__(*self*, *name*)

__setattr__(*self*, *name*, *value*)
`x.__setattr__('name', value) <==> x.name = value`

Overrides: object.__setattr__ extit(inherited documentation)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__init__(*self*, *object*, *method*, *name*=False)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

clone(*self*, *new_object*)

```
Returns an object that re-binds the underlying "method" to
the specified new object.
```

8.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

8.5 Class BuilderDict

UserDict.UserDict
└
SCons.Environment.BuilderDict

```
This is a dictionary-like class used by an Environment to hold
the Builders.  We need to do this because every time someone changes
the Builders in the Environment's BUILDERS dictionary, we must
update the Environment's attributes.
```

8.5.1 Methods

__init__(*self*, *dict*, *env*)
Overrides: UserDict.UserDict.__init__

__semi_deepcopy__(*self*)

__setitem__(*self*, *item*, *val*)
Overrides: UserDict.UserDict.__setitem__

__delitem__(*self*, *item*)
Overrides: UserDict.UserDict.__delitem__

update(*self*, *dict*)
Overrides: UserDict.UserDict.update

__cmp__(*self*, *dict*)

__**contains**__(*self*, *key*)

__**getitem**__(*self*, *key*)

__**len**__(*self*)

__**repr**__(*self*)

clear(*self*)

copy(*self*)

fromkeys(*cls*, *iterable*, *value*=`False`)

get(*self*, *key*, *failobj*=`False`)

has_key(*self*, *key*)

items(*self*)

iteritems(*self*)

iterkeys(*self*)

itervalues(*self*)

keys(*self*)

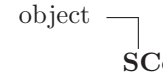
pop(*self*, *key*, **args*)

popitem(*self*)

setdefault(*self*, *key*, *failobj*=`False`)

values(*self*)

8.6 Class SubstitutionEnvironment



Known Subclasses: SCons.Environment.Base

```
Base class for different flavors of construction environments.

This class contains a minimal set of methods that handle contruction
variable expansion and conversion of strings to Nodes, which may or
```

```
may not be actually useful as a stand-alone class.  Which methods
ended up in this class is pretty arbitrary right now.  They're
basically the ones which we've empirically determined are common to
the different construction environment subclasses, and most of the
others that use or touch the underlying dictionary of construction
variables.

Eventually, this class should contain all the methods that we
determine are necessary for a "minimal" interface to the build engine.
A full "native Python" SCons environment has gotten pretty heavyweight
with all of the methods and Tools and construction variables we've
jammed in there, so it would be nice to have a lighter weight
alternative for interfaces that don't need all of the bells and
whistles.  (At some point, we'll also probably rename this class
"Base," since that more reflects what we want this class to become,
but because we've released comments that tell people to subclass
Environment.Base to create their own flavors of construction
environment, we'll save that for a future refactoring when this
class actually becomes useful.)
```

8.6.1 Methods

__init__(*self*, ***kw*)

```
Initialization of an underlying SubstitutionEnvironment class.
```

Overrides: object.__init__

__cmp__(*self*, *other*)

__delitem__(*self*, *key*)

__getitem__(*self*, *key*)

__setitem__(*self*, *key*, *value*)

get(*self*, *key*, *default*=`False`)

```
Emulates the get() method of dictionaries.
```

has_key(*self*, *key*)

__contains__(*self*, *key*)

items(*self*)

arg2nodes(*self*, *args*, *node_factory*=<class 'SCons.Environment._Null'>, *lookup_list*=<class 'SCons.Environment._Null'>, ***kw*)

gvars(*self*)

lvars(*self*)

subst(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Recursively interpolates construction variables from the
Environment into the specified string, returning the expanded
result.  Construction variables are specified by a $ prefix
in the string and begin with an initial underscore or
alphabetic character followed by any number of underscores
or alphanumeric characters.  The construction variable names
may be surrounded by curly braces to separate the name from
trailing characters.
```

subst_kw(*self*, *kw*, *raw*=0, *target*=False, *source*=False)

subst_list(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Calls through to SCons.Subst.scons_subst_list().  See
the documentation for that function.
```

subst_path(*self*, *path*, *target*=False, *source*=False)

```
Substitute a path list, turning EntryProxies into Nodes
and leaving Nodes (and other objects) as-is.
```

subst_target_source(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Recursively interpolates construction variables from the
Environment into the specified string, returning the expanded
result.  Construction variables are specified by a $ prefix
in the string and begin with an initial underscore or
alphabetic character followed by any number of underscores
or alphanumeric characters.  The construction variable names
may be surrounded by curly braces to separate the name from
trailing characters.
```

backtick(*self*, *command*)

AddMethod(*self*, *function*, *name*=False)

```
Adds the specified function as a method of this construction
environment with the specified name.  If the name is omitted,
the default name is the name of the function itself.
```

RemoveMethod(*self*, *function*)

```
Removes the specified function's MethodWrapper from the
added_methods list, so we don't re-bind it when making a clone.
```

Override(*self*, *overrides*)

```
Produce a modified environment whose variables are overriden by
the overrides dictionaries.  "overrides" is a dictionary that
will override the variables of this environment.

This function is much more efficient than Clone() or creating
a new Environment because it doesn't copy the construction
environment dictionary, it just wraps the underlying construction
environment, and doesn't even create a wrapper object if there
are no overrides.
```

ParseFlags(*self*, **flags*)

```
Parse the set of flags and return a dict with the flags placed
in the appropriate entry.  The flags are treated as a typical
set of command-line flags for a GNU-like toolchain and used to
populate the entries in the dict immediately below.  If one of
the flag strings begins with a bang (exclamation mark), it is
assumed to be a command and the rest of the string is executed;
the result of that evaluation is then added to the dict.
```

MergeFlags(*self*, *args*, *unique*=1, *dict*=False)

```
Merge the dict in args into the construction variables of this
env, or the passed-in dict.  If args is not a dict, it is
converted into a dict using ParseFlags.  If unique is not set,
the flags are appended rather than merged.
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__**reduce**__(*...*)

```
helper for pickle
```

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__**str**__(*x*)

```
str(x)
```

8.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

8.6.3 Class Variables

Name	Description
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass

8.7 Class Base

object

SCons.Environment.SubstitutionEnvironment

SCons.Environment.Base

Known Subclasses: SCons.Environment.OverrideEnvironment, SCons.Script.SConscript'.SConsEnvironment

```
Base class for "real" construction Environments.  These are the
primary objects used to communicate dependency and construction
information to the build engine.
```

```
Keyword arguments supplied when the construction Environment
is created are construction variables used to initialize the
Environment.
```

8.7.1 Methods

Action(*self*, **args*, ***kw*)

AddMethod(*self*, *function*, *name*=`False`)

```
Adds the specified function as a method of this construction
environment with the specified name.  If the name is omitted,
the default name is the name of the function itself.
```

AddPostAction(*self*, *files*, *action*)

AddPreAction(*self*, *files*, *action*)

Alias(*self*, *target*, *source*=`[]`, *action*=`False`, ***kw*)

AlwaysBuild(*self*, **targets*)

Append(*self*, ***kw*)

```
Append values to existing construction variables
in an Environment.
```

AppendENVPath(*self*, *name*, *newpath*, *envname*=`'ENV'`, *sep*=`':'`, *delete_existing*=`1`)

```
Append path elements to the path 'name' in the 'ENV'
dictionary for this environment.  Will only add any particular
path once, and will normpath and normcase all paths to help
assure this.  This can also handle the case where the env
variable is a list instead of a string.

If delete_existing is 0, a newpath which is already in the path
will not be moved to the end (it will be left where it is).
```

AppendUnique(*self*, *delete_existing*=`0`, ***kw*)

```
Append values to existing construction variables
in an Environment, if they're not already there.
If delete_existing is 1, removes existing values first, so
values move to end.
```

BuildDir(*self*, **args*, ***kw*)

Builder(*self*, ***kw*)

CacheDir(*self*, *path*)

Clean(*self*, *targets*, *files*)

Clone(*self*, *tools*=[], *toolpath*=False, *parse_flags*=False, ***kw*)

```
Return a copy of a construction Environment.  The
copy is like a Python "deep copy"--that is, independent
copies are made recursively of each objects--except that
a reference is copied when an object is not deep-copyable
(like a function).  There are no references to any mutable
objects in the original Environment.
```

Command(*self*, *target*, *source*, *action*, ***kw*)

```
Builds the supplied target files from the supplied
source files using the supplied action.  Action may
be any type that the Builder constructor will accept
for an action.
```

Configure(*self*, **args*, ***kw*)

Copy(*self*, **args*, ***kw*)

Decider(*self*, *function*)

Depends(*self*, *target*, *dependency*)

```
Explicity specify that 'target's depend on 'dependency'.
```

Detect(*self*, *progs*)

```
Return the first available program in progs.
```

Dictionary(*self*, **args*)

Dir(*self*, *name*, **args*, ***kw*)

Dump(*self*, *key*=False)

```
Using the standard Python pretty printer, dump the contents of the
scons build environment to stdout.

If the key passed in is anything other than None, then that will
be used as an index into the build environment dictionary and
whatever is found there will be fed into the pretty printer. Note
that this key is case sensitive.
```

Entry(*self*, *name*, **args*, ***kw*)

Environment(*self*, ***kw*)

Execute(*self*, *action*, **args*, ***kw*)

```
Directly execute an action through an Environment
```

File(*self*, *name*, **args*, ***kw*)

FindFile(*self*, *file*, *dirs*)

FindInstalledFiles(*self*)

```
returns the list of all targets of the Install and InstallAs Builder.
```

FindIxes(*self*, *paths*, *prefix*, *suffix*)

```
Search a list of paths for something that matches the prefix and suffix.

paths - the list of paths or nodes.
prefix - construction variable for the prefix.
suffix - construction variable for the suffix.
```

FindSourceFiles(*self*, *node*='.')

```
returns a list of all source files.
```

Flatten(*self*, *sequence*)

GetBuildPath(*self*, *files*)

Glob(*self*, *pattern*, *ondisk*=`True`, *source*=`False`, *strings*=`False`)

Ignore(*self*, *target*, *dependency*)

```
Ignore a dependency.
```

Literal(*self*, *string*)

Local(*self*, **targets*)

MergeFlags(*self*, *args*, *unique*=`1`, *dict*=`False`)

```
Merge the dict in args into the construction variables of this
env, or the passed-in dict.  If args is not a dict, it is
converted into a dict using ParseFlags.  If unique is not set,
the flags are appended rather than merged.
```

NoCache(*self*, **targets*)

```
Tags a target so that it will not be cached
```

NoClean(*self*, **targets*)

```
Tags a target so that it will not be cleaned by -c
```

Override(*self*, *overrides*)

```
Produce a modified environment whose variables are overriden by
the overrides dictionaries.  "overrides" is a dictionary that
will override the variables of this environment.

This function is much more efficient than Clone() or creating
a new Environment because it doesn't copy the construction
environment dictionary, it just wraps the underlying construction
environment, and doesn't even create a wrapper object if there
are no overrides.
```

ParseConfig(*self*, *command*, *function*=`False`, *unique*=`1`)

```
Use the specified function to parse the output of the command
in order to modify the current environment.  The 'command' can
be a string or a list of strings representing a command and
its arguments.  'Function' is an optional argument that takes
the environment, the output of the command, and the unique flag.
If no function is specified, MergeFlags, which treats the output
as the result of a typical 'X-config' command (i.e. gtk-config),
will merge the output into the appropriate variables.
```

ParseDepends(*self*, *filename*, *must_exist*=False, *only_one*=0)

```
Parse a mkdep-style file for explicit dependencies.  This is
completely abusable, and should be unnecessary in the "normal"
case of proper SCons configuration, but it may help make
the transition from a Make hierarchy easier for some people
to swallow.  It can also be genuinely useful when using a tool
that can write a .d file, but for which writing a scanner would
be too complicated.
```

ParseFlags(*self*, **flags*)

```
Parse the set of flags and return a dict with the flags placed
in the appropriate entry.  The flags are treated as a typical
set of command-line flags for a GNU-like toolchain and used to
populate the entries in the dict immediately below.  If one of
the flag strings begins with a bang (exclamation mark), it is
assumed to be a command and the rest of the string is executed;
the result of that evaluation is then added to the dict.
```

Platform(*self*, *platform*)

Precious(*self*, **targets*)

Prepend(*self*, ***kw*)

```
Prepend values to existing construction variables
in an Environment.
```

PrependENVPath(*self*, *name*, *newpath*, *envname*='ENV', *sep*=':', *delete_existing*=1)

```
Prepend path elements to the path 'name' in the 'ENV'
dictionary for this environment.  Will only add any particular
path once, and will normpath and normcase all paths to help
assure this.  This can also handle the case where the env
variable is a list instead of a string.

If delete_existing is 0, a newpath which is already in the path
will not be moved to the front (it will be left where it is).
```

PrependUnique(*self*, *delete_existing*=0, ***kw*)

```
Prepend values to existing construction variables
in an Environment, if they're not already there.
If delete_existing is 1, removes existing values first, so
values move to front.
```

RemoveMethod(*self*, *function*)

```
Removes the specified function's MethodWrapper from the
added_methods list, so we don't re-bind it when making a clone.
```

Replace(*self*, ***kw*)

```
Replace existing construction variables in an Environment
with new construction variables and/or values.
```

ReplaceIxes(*self*, *path*, *old_prefix*, *old_suffix*, *new_prefix*, *new_suffix*)

```
Replace old_prefix with new_prefix and old_suffix with new_suffix.

env - Environment used to interpolate variables.
path - the path that will be modified.
old_prefix - construction variable for the old prefix.
old_suffix - construction variable for the old suffix.
new_prefix - construction variable for the new prefix.
new_suffix - construction variable for the new suffix.
```

Repository(*self*, **dirs*, ***kw*)

Requires(*self*, *target*, *prerequisite*)

```
Specify that 'prerequisite' must be built before 'target',
(but 'target' does not actually depend on 'prerequisite'
and need not be rebuilt if it changes).
```

SConsignFile(*self*, *name*='.sconsign', *dbm_module*=False)

Scanner(*self*, **args*, ***kw*)

SetDefault(*self*, ***kw*)

SideEffect(*self*, *side_effect*, *target*)

```
Tell scons that side_effects are built as side
effects of building targets.
```

SourceCode(*self*, *entry*, *builder*)

```
Arrange for a source code builder for (part of) a tree.
```

SourceSignatures(*self*, *type*)

Split(*self*, *arg*)

```
This function converts a string or list into a list of strings
or Nodes.  This makes things easier for users by allowing files to
be specified as a white-space separated list to be split.
The input rules are:
    - A single string containing names separated by spaces. These will be
      split apart at the spaces.
    - A single Node instance
    - A list containing either strings or Node instances. Any strings
      in the list are not split at spaces.
In all cases, the function returns a list of Nodes and strings.
```

TargetSignatures(*self*, *type*)

Tool(*self*, *tool*, *toolpath*=`False`, ***kw*)

Value(*self*, *value*, *built_value*=`False`)

VariantDir(*self*, *variant_dir*, *src_dir*, *duplicate*=`1`)

WhereIs(*self*, *prog*, *path*=`False`, *pathext*=`False`, *reject*=`[]`)

```
Find prog in the path.
```

__cmp__(*self*, *other*)

__contains__(*self*, *key*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__delitem__(*self*, *key*)

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__getitem__(*self*, *key*)

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *platform*=False, *tools*=False, *toolpath*=False, *variables*=False, *parse_flags*=False, ***kw*)

```
Initialization of a basic SCons construction environment,
including setting up special construction variables like BUILDER,
PLATFORM, etc., and searching for and applying available Tools.

Note that we do *not* call the underlying base class
(SubsitutionEnvironment) initialization, because we need to
initialize things in a very specific order that doesn't work
with the much simpler base class initialization.
```

Overrides: SCons.Environment.SubstitutionEnvironment.__init__

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__setitem__(*self*, *key*, *value*)

__str__(*x*)

```
str(x)
```

arg2nodes(*self*, *args*, *node_factory*=<class 'SCons.Environment._Null'>, *lookup_list*=<class 'SCons.Environment._Null'>, ***kw*)

backtick(*self*, *command*)

get(*self*, *key*, *default*=False)

```
Emulates the get() method of dictionaries.
```

get_CacheDir(*self*)

get_builder(*self*, *name*)

```
Fetch the builder with the specified name from the environment.
```

get_factory(*self*, *factory*, *default*='File')

```
Return a factory function for creating Nodes for this
construction environment.
```

get_scanner(*self*, *skey*)

```
Find the appropriate scanner given a key (usually a file suffix).
```

get_src_sig_type(*self*)

get_tgt_sig_type(*self*)

gvars(*self*)

has_key(*self*, *key*)

items(*self*)

lvars(*self*)

scanner_map_delete(*self*, *kw*=False)

```
Delete the cached scanner map (if we need to).
```

subst(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Recursively interpolates construction variables from the
Environment into the specified string, returning the expanded
result.  Construction variables are specified by a $ prefix
in the string and begin with an initial underscore or
alphabetic character followed by any number of underscores
or alphanumeric characters.  The construction variable names
may be surrounded by curly braces to separate the name from
trailing characters.
```

subst_kw(*self*, *kw*, *raw*=0, *target*=False, *source*=False)

subst_list(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Calls through to SCons.Subst.scons_subst_list().  See
the documentation for that function.
```

subst_path(*self*, *path*, *target*=False, *source*=False)

```
Substitute a path list, turning EntryProxies into Nodes
and leaving Nodes (and other objects) as-is.
```

subst_target_source(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Recursively interpolates construction variables from the
Environment into the specified string, returning the expanded
result.  Construction variables are specified by a $ prefix
in the string and begin with an initial underscore or
alphabetic character followed by any number of underscores
or alphanumeric characters.  The construction variable names
may be surrounded by curly braces to separate the name from
trailing characters.
```

8.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

8.7.3 Class Variables

Name	Description
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass
memoizer_counters	**Value:** []

8.8 Class OverrideEnvironment

object

SCons.Environment.SubstitutionEnvironment

SCons.Environment.Base

SCons.Environment.OverrideEnvironment

```
A proxy that overrides variables in a wrapped construction
environment by returning values from an overrides dictionary in
preference to values from the underlying subject environment.

This is a lightweight (I hope) proxy that passes through most use of
attributes to the underlying Environment.Base class, but has just
enough additional methods defined to act like a real construction
environment with overridden values.  It can wrap either a Base
construction environment, or another OverrideEnvironment, which
can in turn nest arbitrary OverrideEnvironments...

Note that we do *not* call the underlying base class
```

```
(SubsitutionEnvironment) initialization, because we get most of those
from proxying the attributes of the subject construction environment.
But because we subclass SubstitutionEnvironment, this class also
has inherited arg2nodes() and subst*() methods; those methods can't
be proxied because they need *this* object's methods to fetch the
values from the overrides dictionary.
```

8.8.1 Methods

__init__(*self*, *subject*, *overrides*={})

```
Initialization of a basic SCons construction environment,
including setting up special construction variables like BUILDER,
PLATFORM, etc., and searching for and applying available Tools.

Note that we do *not* call the underlying base class
(SubsitutionEnvironment) initialization, because we need to
initialize things in a very specific order that doesn't work
with the much simpler base class initialization.
```

Overrides: SCons.Environment.Base.__init__ extit(inherited documentation)

__getattr__(*self*, *name*)

__setattr__(*self*, *name*, *value*)
`x.__setattr__('name', value) <==> x.name = value`

Overrides: object.__setattr__ extit(inherited documentation)

__getitem__(*self*, *key*)
Overrides: SCons.Environment.SubstitutionEnvironment.__getitem__

__setitem__(*self*, *key*, *value*)
Overrides: SCons.Environment.SubstitutionEnvironment.__setitem__

__delitem__(*self*, *key*)
Overrides: SCons.Environment.SubstitutionEnvironment.__delitem__

get(*self*, *key*, *default*=`False`)

```
Emulates the get() method of dictionaries.
```

Overrides: SCons.Environment.SubstitutionEnvironment.get

has_key(*self*, *key*)
Overrides: SCons.Environment.SubstitutionEnvironment.has_key

__contains__(*self*, *key*)
Overrides: SCons.Environment.SubstitutionEnvironment.__contains__

Dictionary(*self*)

```
Emulates the items() method of dictionaries.
```

Overrides: SCons.Environment.Base.Dictionary

items(*self*)

```
Emulates the items() method of dictionaries.
```

Overrides: SCons.Environment.SubstitutionEnvironment.items

gvars(*self*)
Overrides: SCons.Environment.SubstitutionEnvironment.gvars

lvars(*self*)
Overrides: SCons.Environment.SubstitutionEnvironment.lvars

Replace(*self*, ***kw*)

```
Replace existing construction variables in an Environment
with new construction variables and/or values.
```

Overrides: SCons.Environment.Base.Replace extit(inherited documentation)

Action(*self*, **args*, ***kw*)

AddMethod(*self*, *function*, *name*=`False`)

```
Adds the specified function as a method of this construction
environment with the specified name.  If the name is omitted,
the default name is the name of the function itself.
```

AddPostAction(*self*, *files*, *action*)

AddPreAction(*self*, *files*, *action*)

Alias(*self*, *target*, *source*=`[]`, *action*=`False`, ***kw*)

AlwaysBuild(*self*, **targets*)

Append(*self*, ***kw*)

```
Append values to existing construction variables
in an Environment.
```

AppendENVPath(*self*, *name*, *newpath*, *envname*='ENV', *sep*=':', *delete_existing*=1)

```
Append path elements to the path 'name' in the 'ENV'
dictionary for this environment.  Will only add any particular
path once, and will normpath and normcase all paths to help
assure this.  This can also handle the case where the env
variable is a list instead of a string.

If delete_existing is 0, a newpath which is already in the path
will not be moved to the end (it will be left where it is).
```

AppendUnique(*self*, *delete_existing*=0, ***kw*)

```
Append values to existing construction variables
in an Environment, if they're not already there.
If delete_existing is 1, removes existing values first, so
values move to end.
```

BuildDir(*self*, **args*, ***kw*)

Builder(*self*, ***kw*)

CacheDir(*self*, *path*)

Clean(*self*, *targets*, *files*)

Clone(*self*, *tools*=[], *toolpath*=False, *parse_flags*=False, ***kw*)

```
Return a copy of a construction Environment.  The
copy is like a Python "deep copy"--that is, independent
copies are made recursively of each objects--except that
a reference is copied when an object is not deep-copyable
(like a function).  There are no references to any mutable
objects in the original Environment.
```

Command(*self*, *target*, *source*, *action*, ***kw*)

```
Builds the supplied target files from the supplied
source files using the supplied action.  Action may
be any type that the Builder constructor will accept
for an action.
```

Configure(*self*, **args*, ***kw*)

Copy(*self*, **args*, ***kw*)

Decider(*self*, *function*)

Depends(*self*, *target*, *dependency*)

```
Explicity specify that 'target's depend on 'dependency'.
```

Detect(*self*, *progs*)

```
Return the first available program in progs.
```

Dir(*self*, *name*, **args*, ***kw*)

Dump(*self*, *key*=False)

```
Using the standard Python pretty printer, dump the contents of the
scons build environment to stdout.

If the key passed in is anything other than None, then that will
be used as an index into the build environment dictionary and
whatever is found there will be fed into the pretty printer. Note
that this key is case sensitive.
```

Entry(*self*, *name*, **args*, ***kw*)

Environment(*self*, ***kw*)

Execute(*self*, *action*, **args*, ***kw*)

```
Directly execute an action through an Environment
```

File(*self*, *name*, **args*, ***kw*)

FindFile(*self*, *file*, *dirs*)

FindInstalledFiles(*self*)

```
returns the list of all targets of the Install and InstallAs Builder.
```

FindIxes(*self*, *paths*, *prefix*, *suffix*)

```
Search a list of paths for something that matches the prefix and suffix.

paths - the list of paths or nodes.
prefix - construction variable for the prefix.
suffix - construction variable for the suffix.
```

FindSourceFiles(*self*, *node*='.')

```
returns a list of all source files.
```

Flatten(*self*, *sequence*)

GetBuildPath(*self*, *files*)

Glob(*self*, *pattern*, *ondisk*=True, *source*=False, *strings*=False)

Ignore(*self*, *target*, *dependency*)

```
Ignore a dependency.
```

Literal(*self*, *string*)

Local(*self*, **targets*)

MergeFlags(*self*, *args*, *unique*=1, *dict*=False)

```
Merge the dict in args into the construction variables of this
env, or the passed-in dict.  If args is not a dict, it is
converted into a dict using ParseFlags.  If unique is not set,
the flags are appended rather than merged.
```

NoCache(*self*, **targets*)

```
Tags a target so that it will not be cached
```

NoClean(*self*, **targets*)

```
Tags a target so that it will not be cleaned by -c
```

Override(*self*, *overrides*)

```
Produce a modified environment whose variables are overriden by
the overrides dictionaries.  "overrides" is a dictionary that
will override the variables of this environment.

This function is much more efficient than Clone() or creating
a new Environment because it doesn't copy the construction
environment dictionary, it just wraps the underlying construction
environment, and doesn't even create a wrapper object if there
are no overrides.
```

ParseConfig(*self*, *command*, *function*=False, *unique*=1)

```
Use the specified function to parse the output of the command
in order to modify the current environment.  The 'command' can
be a string or a list of strings representing a command and
its arguments.  'Function' is an optional argument that takes
the environment, the output of the command, and the unique flag.
If no function is specified, MergeFlags, which treats the output
as the result of a typical 'X-config' command (i.e. gtk-config),
will merge the output into the appropriate variables.
```

ParseDepends(*self*, *filename*, *must_exist*=False, *only_one*=0)

```
Parse a mkdep-style file for explicit dependencies.  This is
completely abusable, and should be unnecessary in the "normal"
case of proper SCons configuration, but it may help make
the transition from a Make hierarchy easier for some people
to swallow.  It can also be genuinely useful when using a tool
that can write a .d file, but for which writing a scanner would
be too complicated.
```

ParseFlags(*self*, **flags*)

```
Parse the set of flags and return a dict with the flags placed
in the appropriate entry.  The flags are treated as a typical
set of command-line flags for a GNU-like toolchain and used to
populate the entries in the dict immediately below.  If one of
the flag strings begins with a bang (exclamation mark), it is
assumed to be a command and the rest of the string is executed;
the result of that evaluation is then added to the dict.
```

Platform(*self*, *platform*)

Precious(*self*, **targets*)

Prepend(*self*, ***kw*)

```
Prepend values to existing construction variables
in an Environment.
```

PrependENVPath(*self*, *name*, *newpath*, *envname*='ENV', *sep*=':', *delete_existing*=1)

```
Prepend path elements to the path 'name' in the 'ENV'
dictionary for this environment.  Will only add any particular
path once, and will normpath and normcase all paths to help
assure this.  This can also handle the case where the env
variable is a list instead of a string.

If delete_existing is 0, a newpath which is already in the path
will not be moved to the front (it will be left where it is).
```

PrependUnique(*self*, *delete_existing*=0, ***kw*)

```
Prepend values to existing construction variables
in an Environment, if they're not already there.
If delete_existing is 1, removes existing values first, so
values move to front.
```

RemoveMethod(*self*, *function*)

```
Removes the specified function's MethodWrapper from the
added_methods list, so we don't re-bind it when making a clone.
```

ReplaceIxes(*self*, *path*, *old_prefix*, *old_suffix*, *new_prefix*, *new_suffix*)

```
Replace old_prefix with new_prefix and old_suffix with new_suffix.

env - Environment used to interpolate variables.
path - the path that will be modified.
old_prefix - construction variable for the old prefix.
old_suffix - construction variable for the old suffix.
new_prefix - construction variable for the new prefix.
new_suffix - construction variable for the new suffix.
```

Repository(*self*, **dirs*, ***kw*)

Requires(*self*, *target*, *prerequisite*)

```
Specify that 'prerequisite' must be built before 'target',
(but 'target' does not actually depend on 'prerequisite'
and need not be rebuilt if it changes).
```

SConsignFile(*self*, *name*='.sconsign', *dbm_module*=False)

Scanner(*self*, **args*, ***kw*)

SetDefault(*self*, ***kw*)

SideEffect(*self*, *side_effect*, *target*)

```
Tell scons that side_effects are built as side
effects of building targets.
```

SourceCode(*self*, *entry*, *builder*)

```
Arrange for a source code builder for (part of) a tree.
```

SourceSignatures(*self*, *type*)

Split(*self*, *arg*)

```
This function converts a string or list into a list of strings
or Nodes.  This makes things easier for users by allowing files to
be specified as a white-space separated list to be split.
The input rules are:
    - A single string containing names separated by spaces. These will be
      split apart at the spaces.
    - A single Node instance
    - A list containing either strings or Node instances. Any strings
      in the list are not split at spaces.
In all cases, the function returns a list of Nodes and strings.
```

TargetSignatures(*self*, *type*)

Tool(*self*, *tool*, *toolpath*=`False`, ***kw*)

Value(*self*, *value*, *built_value*=`False`)

VariantDir(*self*, *variant_dir*, *src_dir*, *duplicate*=`1`)

WhereIs(*self*, *prog*, *path*=`False`, *pathext*=`False`, *reject*=`[]`)

```
Find prog in the path.
```

__cmp__(*self*, *other*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__str__(*x*)

```
str(x)
```

arg2nodes(*self*, *args*, *node_factory*=<class 'SCons.Environment._Null'>, *lookup_list*=<class 'SCons.Environment._Null'>, ***kw*)

backtick(*self*, *command*)

get_CacheDir(*self*)

get_builder(*self*, *name*)

```
Fetch the builder with the specified name from the environment.
```

get_factory(*self*, *factory*, *default*='File')

```
Return a factory function for creating Nodes for this
construction environment.
```

get_scanner(*self*, *skey*)

```
Find the appropriate scanner given a key (usually a file suffix).
```

get_src_sig_type(*self*)

get_tgt_sig_type(*self*)

scanner_map_delete(*self*, *kw*=False)

```
Delete the cached scanner map (if we need to).
```

subst(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Recursively interpolates construction variables from the
Environment into the specified string, returning the expanded
result.  Construction variables are specified by a $ prefix
in the string and begin with an initial underscore or
alphabetic character followed by any number of underscores
or alphanumeric characters.  The construction variable names
may be surrounded by curly braces to separate the name from
trailing characters.
```

subst_kw(*self*, *kw*, *raw*=0, *target*=False, *source*=False)

subst_list(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Calls through to SCons.Subst.scons_subst_list().  See
the documentation for that function.
```

subst_path(*self*, *path*, *target*=False, *source*=False)

```
Substitute a path list, turning EntryProxies into Nodes
and leaving Nodes (and other objects) as-is.
```

subst_target_source(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Recursively interpolates construction variables from the
Environment into the specified string, returning the expanded
result.  Construction variables are specified by a $ prefix
in the string and begin with an initial underscore or
alphabetic character followed by any number of underscores
or alphanumeric characters.  The construction variable names
may be surrounded by curly braces to separate the name from
trailing characters.
```

8.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

8.8.3 Class Variables

Name	Description
__metaclass__	**Value:** `SCons.Memoize.Memoized_Metaclass`
memoizer_counters	**Value:** `[]`

8.9 Class Base

object

SCons.Environment.SubstitutionEnvironment

SCons.Environment.Base

Known Subclasses: SCons.Environment.OverrideEnvironment, SCons.Script.SConscript'.SConsEnvironment

```
Base class for "real" construction Environments.  These are the
primary objects used to communicate dependency and construction
information to the build engine.

Keyword arguments supplied when the construction Environment
is created are construction variables used to initialize the
Environment.
```

8.9.1 Methods

Action(*self*, **args*, ***kw*)

AddMethod(*self*, *function*, *name*=`False`)

```
Adds the specified function as a method of this construction
environment with the specified name.  If the name is omitted,
the default name is the name of the function itself.
```

AddPostAction(*self*, *files*, *action*)

AddPreAction(*self*, *files*, *action*)

Alias(*self*, *target*, *source*=`[]`, *action*=`False`, ***kw*)

AlwaysBuild(*self*, **targets*)

Append(*self*, ***kw*)

```
Append values to existing construction variables
in an Environment.
```

AppendENVPath(*self*, *name*, *newpath*, *envname*='ENV', *sep*=':', *delete_existing*=1)

```
Append path elements to the path 'name' in the 'ENV'
dictionary for this environment.  Will only add any particular
path once, and will normpath and normcase all paths to help
assure this.  This can also handle the case where the env
variable is a list instead of a string.

If delete_existing is 0, a newpath which is already in the path
will not be moved to the end (it will be left where it is).
```

AppendUnique(*self*, *delete_existing*=0, ***kw*)

```
Append values to existing construction variables
in an Environment, if they're not already there.
If delete_existing is 1, removes existing values first, so
values move to end.
```

BuildDir(*self*, **args*, ***kw*)

Builder(*self*, ***kw*)

CacheDir(*self*, *path*)

Clean(*self*, *targets*, *files*)

Clone(*self*, *tools*=[], *toolpath*=False, *parse_flags*=False, ***kw*)

```
Return a copy of a construction Environment.  The
copy is like a Python "deep copy"--that is, independent
copies are made recursively of each objects--except that
a reference is copied when an object is not deep-copyable
(like a function).  There are no references to any mutable
objects in the original Environment.
```

Command(*self*, *target*, *source*, *action*, ***kw*)

```
Builds the supplied target files from the supplied
source files using the supplied action.  Action may
be any type that the Builder constructor will accept
for an action.
```

Configure(*self*, **args*, ***kw*)

Copy(*self*, **args*, ***kw*)

Decider(*self*, *function*)

Depends(*self*, *target*, *dependency*)

```
Explicity specify that 'target's depend on 'dependency'.
```

Detect(*self*, *progs*)

```
Return the first available program in progs.
```

Dictionary(*self*, **args*)

Dir(*self*, *name*, **args*, ***kw*)

Dump(*self*, *key*=False)

```
Using the standard Python pretty printer, dump the contents of the
scons build environment to stdout.

If the key passed in is anything other than None, then that will
be used as an index into the build environment dictionary and
whatever is found there will be fed into the pretty printer. Note
that this key is case sensitive.
```

Entry(*self*, *name*, **args*, ***kw*)

Environment(*self*, ***kw*)

Execute(*self*, *action*, **args*, ***kw*)

```
Directly execute an action through an Environment
```

File(*self*, *name*, **args*, ***kw*)

FindFile(*self*, *file*, *dirs*)

FindInstalledFiles(*self*)

```
returns the list of all targets of the Install and InstallAs Builder.
```

FindIxes(*self*, *paths*, *prefix*, *suffix*)

```
Search a list of paths for something that matches the prefix and suffix.

paths - the list of paths or nodes.
prefix - construction variable for the prefix.
suffix - construction variable for the suffix.
```

FindSourceFiles(*self*, *node*='.')

```
returns a list of all source files.
```

Flatten(*self*, *sequence*)

GetBuildPath(*self*, *files*)

Glob(*self*, *pattern*, *ondisk*=True, *source*=False, *strings*=False)

Ignore(*self*, *target*, *dependency*)

```
Ignore a dependency.
```

Literal(*self*, *string*)

Local(*self*, **targets*)

MergeFlags(*self*, *args*, *unique*=1, *dict*=False)

```
Merge the dict in args into the construction variables of this
env, or the passed-in dict.  If args is not a dict, it is
converted into a dict using ParseFlags.  If unique is not set,
the flags are appended rather than merged.
```

NoCache(*self*, **targets*)

```
Tags a target so that it will not be cached
```

NoClean(*self*, **targets*)

```
Tags a target so that it will not be cleaned by -c
```

Override(*self*, *overrides*)

```
Produce a modified environment whose variables are overriden by
the overrides dictionaries.  "overrides" is a dictionary that
will override the variables of this environment.

This function is much more efficient than Clone() or creating
a new Environment because it doesn't copy the construction
environment dictionary, it just wraps the underlying construction
environment, and doesn't even create a wrapper object if there
are no overrides.
```

ParseConfig(*self*, *command*, *function*=False, *unique*=1)

```
Use the specified function to parse the output of the command
in order to modify the current environment.  The 'command' can
be a string or a list of strings representing a command and
its arguments.  'Function' is an optional argument that takes
the environment, the output of the command, and the unique flag.
If no function is specified, MergeFlags, which treats the output
as the result of a typical 'X-config' command (i.e. gtk-config),
will merge the output into the appropriate variables.
```

ParseDepends(*self*, *filename*, *must_exist*=False, *only_one*=0)

```
Parse a mkdep-style file for explicit dependencies.  This is
completely abusable, and should be unnecessary in the "normal"
case of proper SCons configuration, but it may help make
the transition from a Make hierarchy easier for some people
to swallow.  It can also be genuinely useful when using a tool
that can write a .d file, but for which writing a scanner would
be too complicated.
```

ParseFlags(*self*, **flags*)

```
Parse the set of flags and return a dict with the flags placed
in the appropriate entry.  The flags are treated as a typical
set of command-line flags for a GNU-like toolchain and used to
populate the entries in the dict immediately below.  If one of
the flag strings begins with a bang (exclamation mark), it is
assumed to be a command and the rest of the string is executed;
the result of that evaluation is then added to the dict.
```

Platform(*self*, *platform*)

Precious(*self*, **targets*)

Prepend(*self*, ***kw*)

```
Prepend values to existing construction variables
in an Environment.
```

PrependENVPath(*self*, *name*, *newpath*, *envname*='ENV', *sep*=':', *delete_existing*=1)

```
Prepend path elements to the path 'name' in the 'ENV'
dictionary for this environment.  Will only add any particular
path once, and will normpath and normcase all paths to help
assure this.  This can also handle the case where the env
variable is a list instead of a string.

If delete_existing is 0, a newpath which is already in the path
will not be moved to the front (it will be left where it is).
```

PrependUnique(*self*, *delete_existing*=0, ***kw*)

```
Prepend values to existing construction variables
in an Environment, if they're not already there.
If delete_existing is 1, removes existing values first, so
values move to front.
```

RemoveMethod(*self*, *function*)

```
Removes the specified function's MethodWrapper from the
added_methods list, so we don't re-bind it when making a clone.
```

Replace(*self*, ***kw*)

```
Replace existing construction variables in an Environment
with new construction variables and/or values.
```

ReplaceIxes(*self*, *path*, *old_prefix*, *old_suffix*, *new_prefix*, *new_suffix*)

```
Replace old_prefix with new_prefix and old_suffix with new_suffix.

env - Environment used to interpolate variables.
path - the path that will be modified.
old_prefix - construction variable for the old prefix.
old_suffix - construction variable for the old suffix.
new_prefix - construction variable for the new prefix.
new_suffix - construction variable for the new suffix.
```

Repository(*self*, **dirs*, ***kw*)

Requires(*self*, *target*, *prerequisite*)

```
Specify that 'prerequisite' must be built before 'target',
(but 'target' does not actually depend on 'prerequisite'
and need not be rebuilt if it changes).
```

SConsignFile(*self*, *name*='.sconsign', *dbm_module*=False)

Scanner(*self*, **args*, ***kw*)

SetDefault(*self*, ***kw*)

SideEffect(*self*, *side_effect*, *target*)

```
Tell scons that side_effects are built as side
effects of building targets.
```

SourceCode(*self*, *entry*, *builder*)

```
Arrange for a source code builder for (part of) a tree.
```

SourceSignatures(*self*, *type*)

Split(*self*, *arg*)

```
This function converts a string or list into a list of strings
or Nodes.  This makes things easier for users by allowing files to
be specified as a white-space separated list to be split.
The input rules are:
    - A single string containing names separated by spaces. These will be
      split apart at the spaces.
    - A single Node instance
    - A list containing either strings or Node instances. Any strings
      in the list are not split at spaces.
In all cases, the function returns a list of Nodes and strings.
```

TargetSignatures(*self*, *type*)

Tool(*self*, *tool*, *toolpath*=False, ***kw*)

Value(*self*, *value*, *built_value*=False)

VariantDir(*self*, *variant_dir*, *src_dir*, *duplicate*=1)

WhereIs(*self*, *prog*, *path*=False, *pathext*=False, *reject*=[])

```
Find prog in the path.
```

__cmp__(*self*, *other*)

__contains__(*self*, *key*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__delitem__(*self*, *key*)

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__getitem__(*self*, *key*)

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *platform*=False, *tools*=False, *toolpath*=False, *variables*=False, *parse_flags*=False, ***kw*)

```
Initialization of a basic SCons construction environment,
including setting up special construction variables like BUILDER,
PLATFORM, etc., and searching for and applying available Tools.

Note that we do *not* call the underlying base class
(SubsitutionEnvironment) initialization, because we need to
initialize things in a very specific order that doesn't work
with the much simpler base class initialization.
```

Overrides: SCons.Environment.SubstitutionEnvironment.__init__

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__setitem__(*self*, *key*, *value*)

__str__(*x*)

```
str(x)
```

arg2nodes(*self*, *args*, *node_factory*=<class 'SCons.Environment._Null'>, *lookup_list*=<class 'SCons.Environment._Null'>, ***kw*)

backtick(*self*, *command*)

get(*self*, *key*, *default*=False)

```
Emulates the get() method of dictionaries.
```

get_CacheDir(*self*)

get_builder(*self*, *name*)

```
Fetch the builder with the specified name from the environment.
```

get_factory(*self*, *factory*, *default*='File')

```
Return a factory function for creating Nodes for this
construction environment.
```

get_scanner(*self*, *skey*)

```
Find the appropriate scanner given a key (usually a file suffix).
```

get_src_sig_type(*self*)

get_tgt_sig_type(*self*)

gvars(*self*)

has_key(*self*, *key*)

items(*self*)

lvars(*self*)

scanner_map_delete(*self*, *kw*=False)

```
Delete the cached scanner map (if we need to).
```

subst(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Recursively interpolates construction variables from the
Environment into the specified string, returning the expanded
result.  Construction variables are specified by a $ prefix
in the string and begin with an initial underscore or
alphabetic character followed by any number of underscores
or alphanumeric characters.  The construction variable names
may be surrounded by curly braces to separate the name from
trailing characters.
```

subst_kw(*self*, *kw*, *raw*=0, *target*=False, *source*=False)

subst_list(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Calls through to SCons.Subst.scons_subst_list().  See
the documentation for that function.
```

subst_path(*self*, *path*, *target*=False, *source*=False)

```
Substitute a path list, turning EntryProxies into Nodes
and leaving Nodes (and other objects) as-is.
```

subst_target_source(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Recursively interpolates construction variables from the
Environment into the specified string, returning the expanded
result.  Construction variables are specified by a $ prefix
in the string and begin with an initial underscore or
alphabetic character followed by any number of underscores
or alphanumeric characters.  The construction variable names
may be surrounded by curly braces to separate the name from
trailing characters.
```

8.9.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

8.9.3 Class Variables

Name	Description
__metaclass__	**Value:** `SCons.Memoize.Memoized_Metaclass`
memoizer_counters	**Value:** `[]`

9 Module SCons.Errors

```
SCons.Errors

This file contains the exception classes used to handle internal
and user errors in SCons.
```

9.1 Functions

convert_to_BuildError(*status*, *exc_info*=False)

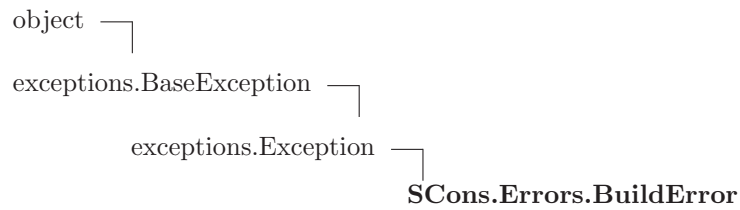
```
Convert any return code a BuildError Exception.

'status' can either be a return code or an Exception.
The buildError.status we set here will normally be
used as the exit status of the "scons" process.
```

9.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Errors.py 5023 2010/06/14 22:05:46 scons'

9.3 Class BuildError




```
Errors occuring while building.

BuildError have the following attributes:

    Information about the cause of the build error:
    -----------------------------------------------

    errstr : a description of the error message

    status : the return code of the action that caused the build
             error. Must be set to a non-zero value even if the
             build error is not due to an action returning a
             non-zero returned code.

    exitstatus : SCons exit status due to this build error.
```

```
                Must be nonzero unless due to an explicit Exit()
                call.  Not always the same as status, since
                actions return a status code that should be
                respected, but SCons typically exits with 2
                irrespective of the return value of the failed
                action.

    filename : The name of the file or directory that caused the
               build error. Set to None if no files are associated with
               this error. This might be different from the target
               being built. For example, failure to create the
               directory in which the target file will appear. It
               can be None if the error is not due to a particular
               filename.

    exc_info : Info about exception that caused the build
               error. Set to (None, None, None) if this build
               error is not due to an exception.


    Information about the cause of the location of the error:
    ---------------------------------------------------------

    node : the error occured while building this target node(s)

    executor : the executor that caused the build to fail (might
               be None if the build failures is not due to the
               executor failing)

    action : the action that caused the build to fail (might be
             None if the build failures is not due to the an
             action failure)

    command : the command line for the action that caused the
              build to fail (might be None if the build failures
              is not due to the an action failure)
```

9.3.1 Methods

__init__(*self*, *node*=False, *errstr*='Unknown error', *status*=2, *exitstatus*=2, *filename*=False, *executor*=False, *action*=False, *command*=False, *exc_info*=(None, None, None))
x.__init__(...) initializes x; see x.__class__.__doc__ for signature

Overrides: exceptions.Exception.__init__ extit(inherited documentation)

__str__(*self*)
str(x)

Overrides: exceptions.BaseException.__str__ extit(inherited documentation)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

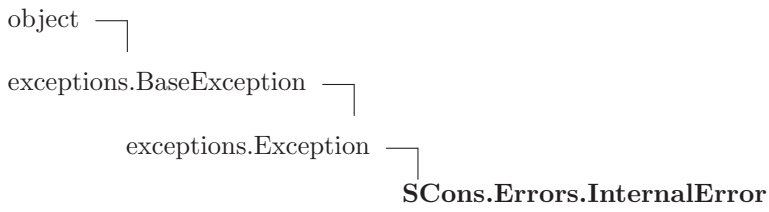
Overrides: object.__setattr__

__setstate__(...)

9.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

9.4 Class InternalError



9.4.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

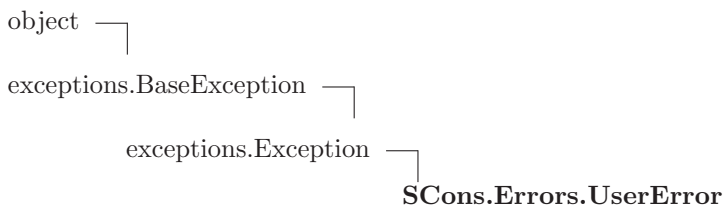
```
str(x)
```

Overrides: object.__str__

9.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

9.5 Class UserError



Known Subclasses: SCons.SConf.SConfError, SCons.Warnings.Warning

9.5.1 Methods

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(*...*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)
helper for pickle

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

Overrides: object.__repr__

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

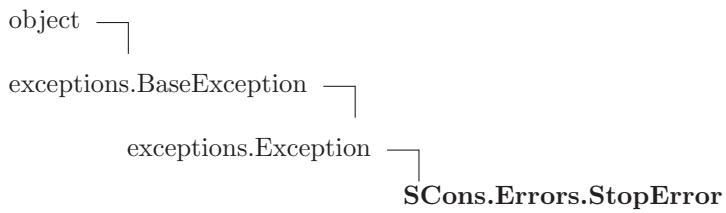
str(x)

Overrides: object.__str__

9.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

9.6 Class StopError



9.6.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

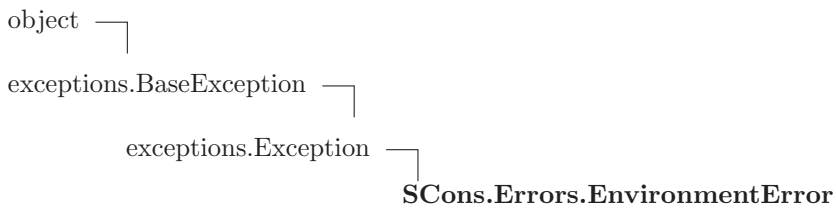
```
str(x)
```

Overrides: object.__str__

9.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

9.7 Class EnvironmentError



9.7.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

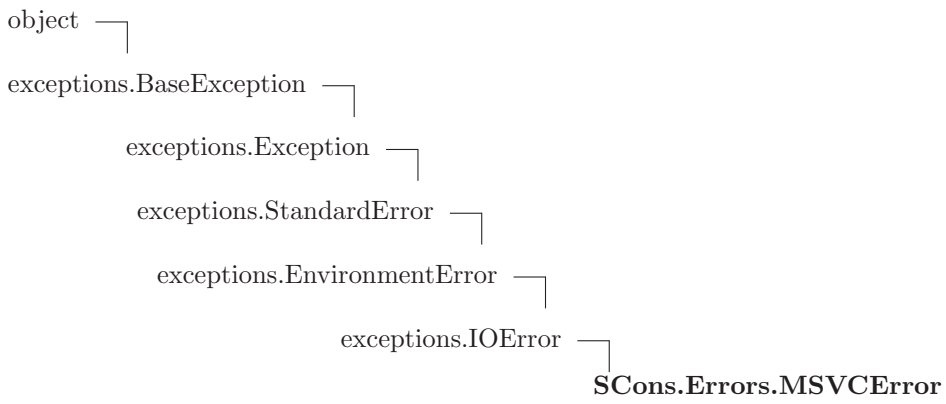
```
str(x)
```

Overrides: object.__str__

9.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

9.8 Class MSVCError



9.8.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.EnvironmentError.__init__

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.EnvironmentError.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: exceptions.BaseException.__reduce__

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

```
str(x)
```

Overrides: exceptions.BaseException.__str__

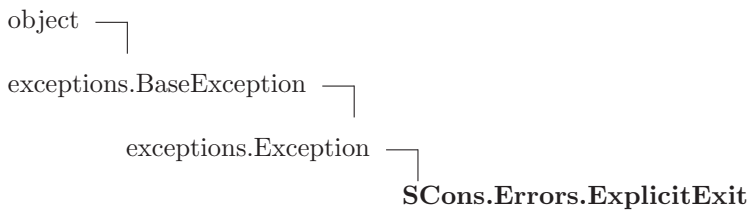
9.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
errno	**Value:** <member 'errno' of 'exceptions.EnvironmentError' objects>
filename	**Value:** <member 'filename' of 'exceptions.EnvironmentError' objects>
message	**Value:** <member 'message' of 'exceptions.EnvironmentError' objects>

continued on next page

Name	Description
strerror	**Value:** <member 'strerror' of 'exceptions.EnvironmentError' objects>

9.9 Class ExplicitExit



9.9.1 Methods

__init__(*self*, *node*=False, *status*=False, **args*)
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
Overrides: exceptions.Exception.__init__ extit(inherited documentation)

__delattr__(...)

x.__delattr__('name') <==> del x.name
Overrides: object.__delattr__

__getattribute__(...)

x.__getattribute__('name') <==> x.name
Overrides: object.__getattribute__

__getitem__(*x*, *y*)

x[y]

__getslice__(*x*, *i*, *j*)

x[i:j]

Use of negative indices is not supported.

__hash__(*x*)

hash(x)

__new__(*T*, *S*, ...)

Return Value
a new object with type S, a subtype of T
Overrides: exceptions.BaseException.__new__

__reduce__(...)
helper for pickle

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

Overrides: object.__repr__

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

str(x)

Overrides: object.__str__

9.9.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

10 Module SCons.Executor

```
SCons.Executor

A module for executing actions with specific lists of target and source
Nodes.
```

10.1 Functions

rfile(*node*)

```
A function to return the results of a Node's rfile() method,
if it exists, and the Node itself otherwise (if it's a Value
Node, e.g.).
```

GetBatchExecutor(*key*)

AddBatchExecutor(*key*, *executor*)

get_NullEnvironment()

```
Use singleton pattern for Null Environments.
```

10.2 Variables

Name	Description
__revision__	**Value:** `'src/engine/SCons/Executor.py 5023 2010/06/14 22:05:46 sc...`
nullenv	**Value:** `False`

10.3 Class Batch

object
└ **SCons.Executor.Batch**

```
Remembers exact association between targets
and sources of executor.
```

10.3.1 Methods

__init__(*self*, *targets*=`[]`, *sources*=`[]`)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

10.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

10.4 Class TSList

UserList.UserList

SCons.Executor.TSList

```
A class that implements $TARGETS or $SOURCES expansions by wrapping
```

```
an executor Method.  This class is used in the Executor.lvars()
to delay creation of NodeList objects until they're needed.

Note that we subclass collections.UserList purely so that the
is_Sequence() function will identify an object of this class as
a list during variable expansion.  We're not really using any
collections.UserList methods in practice.
```

10.4.1 Methods

__**init**__(*self*, *func*)
Overrides: UserList.UserList.__init__

__**getattr**__(*self*, *attr*)

__**getitem**__(*self*, *i*)
Overrides: UserList.UserList.__getitem__

__**getslice**__(*self*, *i*, *j*)
Overrides: UserList.UserList.__getslice__

__**str**__(*self*)

__**repr**__(*self*)
Overrides: UserList.UserList.__repr__

__**add**__(*self*, *other*)

__**cmp**__(*self*, *other*)

__**contains**__(*self*, *item*)

__**delitem**__(*self*, *i*)

__**delslice**__(*self*, *i*, *j*)

__**eq**__(*self*, *other*)

__**ge**__(*self*, *other*)

__**gt**__(*self*, *other*)

__**iadd**__(*self*, *other*)

__**imul**__(*self*, *n*)

__**le**__(*self*, *other*)

__**len**__(*self*)

__**lt**__(*self*, *other*)

__**mul**__(*self*, *n*)

__**ne**__(*self*, *other*)

__**radd**__(*self*, *other*)

__**rmul**__(*self*, *n*)

__**setitem**__(*self*, *i*, *item*)

__**setslice**__(*self*, *i*, *j*, *other*)

append(*self*, *item*)

count(*self*, *item*)

extend(*self*, *other*)

index(*self*, *item*, **args*)

insert(*self*, *i*, *item*)

pop(*self*, *i*=-1)

remove(*self*, *item*)

reverse(*self*)

sort(*self*, **args*, ***kwds*)

10.5 Class TSObject

object
└ **SCons.Executor.TSObject**

```
A class that implements $TARGET or $SOURCE expansions by wrapping
an Executor method.
```

10.5.1 Methods

__**init**__(*self*, *func*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__**getattr**__(*self*, *attr*)

__**str**__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

__**repr**__(*self*)
`repr(x)`

Overrides: object.__repr__ extit(inherited documentation)

__**delattr**__(*...*)

`x.__delattr__('name') <==> del x.name`

__**getattribute**__(*...*)

`x.__getattribute__('name') <==> x.name`

__**hash**__(*x*)

`hash(x)`

__**new**__(*T*, *S*, *...*)

Return Value

`a new object with type S, a subtype of T`

__**reduce**__(*...*)

`helper for pickle`

__**reduce_ex**__(*...*)

`helper for pickle`

__**setattr**__(*...*)

`x.__setattr__('name', value) <==> x.name = value`

10.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

10.6 Class Executor

object
└ **SCons.Executor.Executor**

A class for controlling instances of executing an action.

This largely exists to hold a single association of an action,
environment, list of environment override dictionaries, targets
and sources for later processing as needed.

10.6.1 Methods

__init__(*self*, *action*, *env*=False, *overridelist*=[{}], *targets*=[], *sources*=[], *builder_kw*={})
x.__init__(...) initializes x; see x.__class__.__doc__ for signature

Overrides: object.__init__ extit(inherited documentation)

get_lvars(*self*)

get_action_targets(*self*)

set_action_list(*self*, *action*)

get_action_list(*self*)

get_all_targets(*self*)

Returns all targets for all batches of this Executor.

get_all_sources(*self*)

Returns all sources for all batches of this Executor.

get_all_children(*self*)

Returns all unique children (dependencies) for all batches
of this Executor.

The Taskmaster can recognize when it's already evaluated a
Node, so we don't have to make this list unique for its intended
canonical use case, but we expect there to be a lot of redundancy
(long lists of batched .cc files #including the same .h files
over and over), so removing the duplicates once up front should
save the Taskmaster a lot of work.

get_all_prerequisites(*self*)

```
Returns all unique (order-only) prerequisites for all batches
of this Executor.
```

get_action_side_effects(*self*)

```
Returns all side effects for all batches of this
Executor used by the underlying Action.
```

get_build_env(*self*)

```
Fetch or create the appropriate build Environment
for this Executor.
```

get_build_scanner_path(*self*, *scanner*)

```
Fetch the scanner path for this executor's targets and sources.
```

get_kw(*self*, *kw*={})

do_nothing(*self*, *target*, *kw*)

do_execute(*self*, *target*, *kw*)

```
Actually execute the action list.
```

__**call**__(*self*, *target*, ***kw*)

cleanup(*self*)

add_sources(*self*, *sources*)

```
Add source files to this Executor's list.  This is necessary
for "multi" Builders that can be called repeatedly to build up
a source file list for a given target.
```

get_sources(*self*)

add_batch(*self*, *targets*, *sources*)

```
Add pair of associated target and source to this Executor's list.
This is necessary for "batch" Builders that can be called repeatedly
to build up a list of matching target and source files that will be
used in order to update multiple target files at once from multiple
corresponding source files, for tools like MSVC that support it.
```

prepare(*self*)

```
Preparatory checks for whether this Executor can go ahead
and (try to) build its targets.
```

add_pre_action(*self*, *action*)

add_post_action(*self*, *action*)

__**str**__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

nullify(*self*)

get_contents(*self*)

```
Fetch the signature contents.  This is the main reason this
class exists, so we can compute this once and cache it regardless
of how many target or source Nodes there are.
```

get_timestamp(*self*)

```
Fetch a time stamp for this Executor.  We don't have one, of
course (only files do), but this is the interface used by the
timestamp module.
```

scan_targets(*self*, *scanner*)

scan_sources(*self*, *scanner*)

scan(*self*, *scanner*, *node_list*)

```
Scan a list of this Executor's files (targets or sources) for
implicit dependencies and update all of the targets with them.
This essentially short-circuits an N*M scan of the sources for
each individual target, which is a hell of a lot more efficient.
```

get_unignored_sources(*self*, *node*, *ignore*=())

get_implicit_deps(*self*)

```
Return the executor's implicit dependencies, i.e. the nodes of
the commands to be executed.
```

__**delattr**__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

10.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

10.6.3 Class Variables

Name	Description
memoizer_counters	**Value:** []

10.6.4 Instance Variables

Name	Description
my_str	**Value:** <function my_str at 0x843187c>

10.7 Class Null

object
└
SCons.Executor.Null

```
A null Executor, with a null build Environment, that does
nothing when the rest of the methods call it.

This might be able to disapper when we refactor things to
disassociate Builders from Nodes entirely, so we're not
going to worry about unit tests for this--at least for now.
```

10.7.1 Methods

__init__(*self*, **args*, ***kw*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

get_build_env(*self*)

get_build_scanner_path(*self*)

cleanup(*self*)

prepare(*self*)

get_unignored_sources(*self*, **args*, ***kw*)

get_action_targets(*self*)

get_action_list(*self*)

get_all_targets(*self*)

get_all_sources(*self*)

get_all_children(*self*)

get_all_prerequisites(*self*)

get_action_side_effects(*self*)

__call__(*self*, **args*, ***kw*)

get_contents(*self*)

add_pre_action(*self*, *action*)

add_post_action(*self*, *action*)

set_action_list(*self*, *action*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

10.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

11 Module SCons.Job

SCons.Job

This module defines the Serial and Parallel classes that execute tasks to complete a build. The Jobs class provides a higher level interface to start, stop, and wait on jobs.

11.1 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Job.py 5023 2010/06/14 22:05:46 scons'
explicit_stack_size	**Value:** False
default_stack_size	**Value:** 256
interrupt_msg	**Value:** 'Build interrupted.'

11.2 Class InterruptState

object
└ **SCons.Job.InterruptState**

11.2.1 Methods

__init__(*self*)
x.__init__(...) initializes x; see x.__class__.__doc__ for signature

Overrides: object.__init__ extit(inherited documentation)

set(*self*)

__call__(*self*)

__delattr__(...)

x.__delattr__('name') <==> del x.name

__getattribute__(...)

x.__getattribute__('name') <==> x.name

__hash__(*x*)

hash(x)

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__**reduce**__(*...*)

```
helper for pickle
```

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__**str**__(*x*)

```
str(x)
```

11.2.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

11.3 Class Jobs

object
└ **SCons.Job.Jobs**

```
An instance of this class initializes N jobs, and provides
methods for starting, stopping, and waiting on all N jobs.
```

11.3.1 Methods

__init__(*self*, *num*, *taskmaster*)

```
create 'num' jobs using the given taskmaster.

If 'num' is 1 or less, then a serial job will be used,
otherwise a parallel job with 'num' worker threads will
be used.

The 'num_jobs' attribute will be set to the actual number of jobs
allocated.  If more than one job is requested but the Parallel
class can't do it, it gets reset to 1.  Wrapping interfaces that
care should check the value of 'num_jobs' after initialization.
```

Overrides: object.__init__

run(*self*, *postfunc*=<function <lambda> at 0x87217d4>)

```
Run the jobs.

postfunc() will be invoked after the jobs has run. It will be
invoked even if the jobs are interrupted by a keyboard
interrupt (well, in fact by a signal such as either SIGINT,
SIGTERM or SIGHUP). The execution of postfunc() is protected
against keyboard interrupts and is guaranteed to run to
completion.
```

were_interrupted(*self*)

```
Returns whether the jobs were interrupted by a signal.
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

helper for pickle

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

__str__(*x*)

str(x)

11.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

11.4 Class Serial

object
└ **SCons.Job.Serial**

This class is used to execute tasks in series, and is more efficient than Parallel, but is only appropriate for non-parallel builds. Only one instance of this class should be in existence at a time.

This class is not thread safe.

11.4.1 Methods

__init__(*self*, *taskmaster*)

Create a new serial job given a taskmaster.

The taskmaster's next_task() method should return the next task that needs to be executed, or None if there are no more tasks. The taskmaster's executed() method will be called for each task when it is successfully executed or failed() will be called if it failed to execute (e.g. execute() raised an exception).

Overrides: object.__init__

start(*self*)

```
Start the job. This will begin pulling tasks from the taskmaster
and executing them, and return when there are no more tasks. If a task
fails to execute (i.e. execute() raises an exception), then the job will
stop.
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

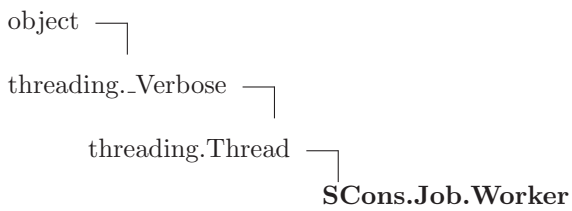
__str__(*x*)

```
str(x)
```

11.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

11.5 Class Worker




```
A worker thread waits on a task to be posted to its request queue,
dequeues the task, executes it, and posts a tuple including the task
and a boolean indicating whether the task executed successfully.
```

11.5.1 Methods

__init__(*self*, *requestQueue*, *resultsQueue*, *interrupted*)
Overrides: threading.Thread.__init__

run(*self*)
Overrides: threading.Thread.run

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*self*)
`repr(x)`

Overrides: object.__repr__ extit(inherited documentation)

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

getName(*self*)

isAlive(*self*)

isDaemon(*self*)

join(*self*, *timeout*=`False`)

setDaemon(*self*, *daemonic*)

setName(*self*, *name*)

start(*self*)

11.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

11.6 Class ThreadPool

object
└ **SCons.Job.ThreadPool**

```
This class is responsible for spawning and managing worker threads.
```

11.6.1 Methods

__init__(*self*, *num*, *stack_size*, *interrupted*)

```
Create the request and reply queues, and 'num' worker threads.

One must specify the stack size of the worker threads. The
stack size is specified in kilobytes.
```

Overrides: object.__init__

put(*self*, *task*)

```
Put task into request queue.
```

get(*self*)

```
Remove and return a result tuple from the results queue.
```

preparation_failed(*self*, *task*)

cleanup(*self*)

```
Shuts down the thread pool, giving each worker thread a
chance to shut down gracefully.
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

11.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

11.7 Class Parallel

object
└
SCons.Job.Parallel

```
This class is used to execute tasks in parallel, and is somewhat
less efficient than Serial, but is appropriate for parallel builds.

This class is thread safe.
```

11.7.1 Methods

__init__(*self*, *taskmaster*, *num*, *stack_size*)

```
Create a new parallel job given a taskmaster.

The taskmaster's next_task() method should return the next
task that needs to be executed, or None if there are no more
tasks. The taskmaster's executed() method will be called
for each task when it is successfully executed or failed()
will be called if the task failed to execute (i.e. execute()
raised an exception).

Note: calls to taskmaster are serialized, but calls to
execute() on distinct tasks are not serialized, because
that is the whole point of parallel jobs: they can execute
multiple tasks simultaneously.
```

Overrides: object.__init__

start(*self*)

```
Start the job. This will begin pulling tasks from the
taskmaster and executing them, and return when there are no
more tasks. If a task fails to execute (i.e. execute() raises
an exception), then the job will stop.
```

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

11.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

12 Module SCons.Memoize

```
Memoizer

A metaclass implementation to count hits and misses of the computed
values that various methods cache in memory.

Use of this modules assumes that wrapped methods be coded to cache their
values in a consistent way.  Here is an example of wrapping a method
that returns a computed value, with no input parameters:

    memoizer_counters = []                                      # Memoization

    memoizer_counters.append(SCons.Memoize.CountValue('foo'))   # Memoization

    def foo(self):

        try:                                                    # Memoization
            return self._memo['foo']                            # Memoization
        except KeyError:                                        # Memoization
            pass                                                # Memoization

        result = self.compute_foo_value()

        self._memo['foo'] = result                              # Memoization

        return result

Here is an example of wrapping a method that will return different values
based on one or more input arguments:

    def _bar_key(self, argument):                               # Memoization
        return argument                                         # Memoization

    memoizer_counters.append(SCons.Memoize.CountDict('bar', _bar_key)) # Memoization

    def bar(self, argument):

        memo_key = argument                                     # Memoization
        try:                                                    # Memoization
            memo_dict = self._memo['bar']                       # Memoization
        except KeyError:                                        # Memoization
            memo_dict = {}                                      # Memoization
            self._memo['dict'] = memo_dict                      # Memoization
        else:                                                   # Memoization
            try:                                                # Memoization
                return memo_dict[memo_key]                      # Memoization
            except KeyError:                                    # Memoization
                pass                                            # Memoization

        result = self.compute_bar_value(argument)
```

```
        memo_dict[memo_key] = result                                # Memoization

        return result

At one point we avoided replicating this sort of logic in all the methods
by putting it right into this module, but we've moved away from that at
present (see the "Historical Note," below.).

Deciding what to cache is tricky, because different configurations
can have radically different performance tradeoffs, and because the
tradeoffs involved are often so non-obvious.  Consequently, deciding
whether or not to cache a given method will likely be more of an art than
a science, but should still be based on available data from this module.
Here are some VERY GENERAL guidelines about deciding whether or not to
cache return values from a method that's being called a lot:

    --  The first question to ask is, "Can we change the calling code
        so this method isn't called so often?"  Sometimes this can be
        done by changing the algorithm.  Sometimes the *caller* should
        be memoized, not the method you're looking at.

    --  The memoized function should be timed with multiple configurations
        to make sure it doesn't inadvertently slow down some other
        configuration.

    --  When memoizing values based on a dictionary key composed of
        input arguments, you don't need to use all of the arguments
        if some of them don't affect the return values.

Historical Note:  The initial Memoizer implementation actually handled
the caching of values for the wrapped methods, based on a set of generic
algorithms for computing hashable values based on the method's arguments.
This collected caching logic nicely, but had two drawbacks:

    Running arguments through a generic key-conversion mechanism is slower
    (and less flexible) than just coding these things directly.  Since the
    methods that need memoized values are generally performance-critical,
    slowing them down in order to collect the logic isn't the right
    tradeoff.

    Use of the memoizer really obscured what was being called, because
    all the memoized methods were wrapped with re-used generic methods.
    This made it more difficult, for example, to use the Python profiler
    to figure out how to optimize the underlying methods.
```

12.1 Functions

Dump(*title*=False)

EnableMemoization()

12.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Memoize.py 5023 2010/06/14 22:05:46 scons'
__doc__	**Value:** """Memoi...
use_memoizer	**Value:** False
CounterList	**Value:** []

12.3 Class Counter

object
└ **SCons.Memoize.Counter**

Known Subclasses: SCons.Memoize.CountDict, SCons.Memoize.CountValue

```
Base class for counting memoization hits and misses.

We expect that the metaclass initialization will have filled in
the .name attribute that represents the name of the function
being counted.
```

12.3.1 Methods

__init__(*self*, *method_name*)

Overrides: object.__init__

display(*self*)

__cmp__(*self*, *other*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__**new**__(*T*, *S*, ...)

Return Value
a new object with type S, a subtype of T

__**reduce**__(...)

helper for pickle

__**reduce_ex**__(...)

helper for pickle

__**repr**__(*x*)

repr(x)

__**setattr**__(...)

x.__setattr__('name', value) <==> x.name = value

__**str**__(*x*)

str(x)

12.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

12.4 Class CountValue

object
SCons.Memoize.Counter
SCons.Memoize.CountValue

A counter class for simple, atomic memoized values.

A CountValue object should be instantiated in a class for each of
the class's methods that memoizes its return value by simply storing
the return value in its _memo dictionary.

We expect that the metaclass initialization will fill in the
.underlying_method attribute with the method that we're wrapping.
We then call the underlying_method method after counting whether
its memoized value has already been set (a hit) or not (a miss).

12.4.1 Methods

__call__(*self*, **args*, ***kw*)

__cmp__(*self*, *other*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *method_name*)

Overrides: object.__init__

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

display(*self*)

12.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

12.5 Class CountDict

object

SCons.Memoize.Counter

SCons.Memoize.CountDict

```
A counter class for memoized values stored in a dictionary, with
keys based on the method's input arguments.

A CountDict object is instantiated in a class for each of the
class's methods that memoizes its return value in a dictionary,
indexed by some key that can be computed from one or more of
its input arguments.

We expect that the metaclass initialization will fill in the
.underlying_method attribute with the method that we're wrapping.
We then call the underlying_method method after counting whether the
computed key value is already present in the memoization dictionary
(a hit) or not (a miss).
```

12.5.1 Methods

__init__(*self*, *method_name*, *keymaker*)

Overrides: SCons.Memoize.Counter.__init__

__call__(*self*, **args*, ***kw*)

__cmp__(*self*, *other*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value
a new object with type S, a subtype of T

__reduce__(*...*)

helper for pickle

__reduce_ex__(*...*)

helper for pickle

__repr__(*x*)

repr(x)

__setattr__(*...*)

x.__setattr__('name', value) <==> x.name = value

__str__(*x*)

str(x)

display(*self*)

12.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

12.6 Class Memoizer

object
└ **SCons.Memoize.Memoizer**

Object which performs caching of method calls for its 'primary'
instance.

12.6.1 Methods

__init__(*self*)
x.__init__(...) initializes x; see x.__class__.__doc__ for signature

Overrides: object.__init__ extit(inherited documentation)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

12.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

12.7 Class Memoized_Metaclass

object
  type
    SCons.Memoize.Memoized_Metaclass

12.7.1 Methods

__init__(*cls*, *name*, *bases*, *cls_dict*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__call__(*x*, *...*)

`x(...)`

__cmp__(*x*, *y*)

`cmp(x,y)`

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

Overrides: object.__delattr__

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

Overrides: object.__getattribute__

__hash__(*x*)

`hash(x)`

Overrides: object.__hash__

__new__(*T*, *S*, *...*)

Return Value

`a new object with type S, a subtype of T`

Overrides: object.__new__

__reduce__(*...*)

`helper for pickle`

__reduce_ex__(*...*)

`helper for pickle`

__repr__(*x*)

`repr(x)`

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__str__(*x*)

```
str(x)
```

__subclasses__()

Return Value

```
list of immediate subclasses
```

mro()

```
return a type's method resolution order
```

Return Value

```
list
```

12.7.2 Properties

Name	Description
__base__	**Value:** <member '__base__' of 'type' objects>
__bases__	**Value:** <attribute '__bases__' of 'type' objects>
__basicsize__	**Value:** <member '__basicsize__' of 'type' objects>
__class__	**Value:** <attribute '__class__' of 'object' objects>
__dictoffset__	**Value:** <member '__dictoffset__' of 'type' objects>
__flags__	**Value:** <member '__flags__' of 'type' objects>
__itemsize__	**Value:** <member '__itemsize__' of 'type' objects>
__mro__	**Value:** <member '__mro__' of 'type' objects>
__name__	**Value:** <attribute '__name__' of 'type' objects>
__weakrefoffset__	**Value:** <member '__weakrefoffset__' of 'type' objects>

13 Package SCons.Node

```
SCons.Node

The Node package for the SCons software construction utility.

This is, in many ways, the heart of SCons.

A Node is where we encapsulate all of the dependency information about
any thing that SCons can build, or about any thing which SCons can use
to build some other thing.  The canonical "thing," of course, is a file,
but a Node can also represent something remote (like a web page) or
something completely abstract (like an Alias).

Each specific type of "thing" is specifically represented by a subclass
of the Node base class:  Node.FS.File for files, Node.Alias for aliases,
etc.  Dependency information is kept here in the base class, and
information specific to files/aliases/etc. is in the subclass.  The
goal, if we've done this correctly, is that any type of "thing" should
be able to depend on any other type of "thing."
```

13.1 Modules

- **Alias**: scons.Node.Alias
  Alias nodes.
  (Section 14, p. 160)
- **FS**: scons.Node.FS
  File system nodes.
  (Section 15, p. 177)
- **Python**: scons.Node.Python
  Python nodes.
  (Section 16, p. 273)

13.2 Functions

classname(*obj*)

Annotate(*node*)

get_children(*node*, *parent*)

ignore_cycle(*node*, *stack*)

do_nothing(*node*, *parent*)

13.3 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Node/__init__.py 5023 2010/06/14 22:05:...
no_state	**Value:** 0
pending	**Value:** 1
executing	**Value:** 2
up_to_date	**Value:** 3
executed	**Value:** 4
failed	**Value:** 5
StateString	**Value:** {0: 'no_state', 1: 'pending', 2: 'executing', 3: 'up_to_d...
implicit_cache	**Value:** 0
implicit_deps_unchanged	**Value:** 0
implicit_deps_changed	**Value:** 0
arg2nodes_lookups	**Value:** [<bound method AliasNameSpace.lookup of {}>]

13.4 Class NodeInfoBase

object
└ **SCons.Node.NodeInfoBase**

Known Subclasses: SCons.Node.Alias.AliasNodeInfo, SCons.Node.FS.DirNodeInfo, SCons.Node.FS.FileNodeInfo, SCons.Node.Python.ValueNodeInfo

```
The generic base class for signature information for a Node.

Node subclasses should subclass NodeInfoBase to provide their own
logic for dealing with their own Node-specific signature information.
```

13.4.1 Methods

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *node*=False)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

convert(*self*, *node*, *val*)

format(*self*, *field_list*=`False`, *names*=`0`)

merge(*self*, *other*)

update(*self*, *node*)

13.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

13.4.3 Class Variables

Name	Description
current_version_id	**Value:** 1

13.5 Class BuildInfoBase

object
└ **SCons.Node.BuildInfoBase**

Known Subclasses: SCons.Node.Alias.AliasBuildInfo, SCons.Node.FS.DirBuildInfo, SCons.Node.FS.FileBuildInfo, SCons.Node.Python.ValueBuildInfo

```
The generic base class for build information for a Node.

This is what gets stored in a .sconsign file for each target file.
It contains a NodeInfo instance for this node (signature information
that's specific to the type of Node) and direct attributes for the
generic build stuff we have to track:  sources, explicit dependencies,
implicit dependencies, and action information.
```

13.5.1 Methods

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *node*=False)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

merge(*self*, *other*)

13.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

13.5.3 Class Variables

Name	Description
current_version_id	**Value:** 1

13.6 Class Node

object
└ **SCons.Node.Node**

Known Subclasses: SCons.Node.Alias.Alias, SCons.Node.FS.Base, SCons.Node.Python.Value

```
The base Node class, for entities that we know how to
build, or use to build other Nodes.
```

13.6.1 Methods

Decider(*self*, *function*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

add_dependency(*self*, *depend*)

```
Adds dependencies.
```

add_ignore(*self*, *depend*)

```
Adds dependencies to ignore.
```

add_prerequisite(*self*, *prerequisite*)

```
Adds prerequisites
```

add_source(*self*, *source*)

```
Adds sources.
```

add_to_implicit(*self*, *deps*)

add_to_waiting_parents(*self*, *node*)

```
Returns the number of nodes added to our waiting parents list:
1 if we add a unique waiting parent, 0 if not.  (Note that the
returned values are intended to be used to increment a reference
count, so don't think you can "clean up" this function by using
True and False instead...)
```

add_to_waiting_s_e(*self*, *node*)

add_wkid(*self*, *wkid*)

```
Add a node to the list of kids waiting to be evaluated
```

all_children(*self*, *scan*=1)

```
Return a list of all the node's direct children.
```

alter_targets(*self*)

```
Return a list of alternate targets for this Node.
```

build(*self*, ***kw*)

```
Actually build the node.

This is called by the Taskmaster after it's decided that the
Node is out-of-date and must be rebuilt, and after the prepare()
method has gotten everything, uh, prepared.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff
in built().
```

builder_set(*self*, *builder*)

built(*self*)

```
Called just after this node is successfully built.
```

changed(*self*, *node*=False)

```
Returns if the node is up-to-date with respect to the BuildInfo
stored last time it was built.  The default behavior is to compare
it against our own previously stored BuildInfo, but the stored
BuildInfo from another Node (typically one in a Repository)
can be used instead.

Note that we now *always* check every dependency.  We used to
short-circuit the check by returning as soon as we detected
any difference, but we now rely on checking every dependency
to make sure that any necessary Node information (for example,
the content signature of an #included .h file) is updated.
```

changed_since_last_build(*self*, *target*, *prev_ni*)

```
Must be overridden in a specific subclass to return True if this
Node (a dependency) has changed since the last time it was used
to build the specified target.  prev_ni is this Node's state (for
example, its file timestamp, length, maybe content signature)
as of the last time the target was built.

Note that this method is called through the dependency, not the
target, because a dependency Node must be able to use its own
logic to decide if it changed.  For example, File Nodes need to
obey if we're configured to use timestamps, but Python Value Nodes
never use timestamps and always use the content.  If this method
were called through the target, then each Node's implementation
of this method would have to have more complicated logic to
handle all the different Node types on which it might depend.
```

children(*self*, *scan*=1)

```
Return a list of the node's direct children, minus those
that are ignored by this node.
```

children_are_up_to_date(*self*)

```
Alternate check for whether the Node is current:  If all of
our children were up-to-date, then this Node was up-to-date, too.

The SCons.Node.Alias and SCons.Node.Python.Value subclasses
rebind their current() method to this method.
```

clear(*self*)

```
Completely clear a Node of all its cached state (so that it
can be re-evaluated by interfaces that do continuous integration
builds).
```

clear_memoized_values(*self*)

del_binfo(*self*)

```
Delete the build info from this node.
```

disambiguate(*self*, *must_exist*=False)

do_not_store_info(*self*)

env_set(*self*, *env*, *safe*=0)

executor_cleanup(*self*)

```
Let the executor clean up any cached information.
```

exists(*self*)

```
Does this node exists?
```

explain(*self*)

for_signature(*self*)

```
Return a string representation of the Node that will always
be the same for this particular Node, no matter what.  This
is by contrast to the __str__() method, which might, for
instance, return a relative path for a file Node.  The purpose
of this method is to generate a value to be used in signature
calculation for the command line used to build a target, and
we use this method instead of str() to avoid unnecessary
rebuilds.  This method does not need to return something that
would actually work in a command line; it can return any kind of
nonsense, so long as it does not change.
```

get_abspath(*self*)

```
Return an absolute path to the Node.  This will return simply
str(Node) by default, but for Node types that have a concept of
relative path, this might return something different.
```

get_binfo(*self*)

```
Fetch a node's build information.

node - the node whose sources will be collected
cache - alternate node to use for the signature cache
returns - the build signature

This no longer handles the recursive descent of the
node's children's signatures.  We expect that they're
already built and updated by someone else, if that's
what's wanted.
```

get_build_env(*self*)

```
Fetch the appropriate Environment to build this node.
```

get_build_scanner_path(*self*, *scanner*)

```
Fetch the appropriate scanner path for this node.
```

get_builder(*self*, *default_builder*=False)

```
Return the set builder, or a specified default value
```

get_cachedir_csig(*self*)

get_csig(*self*)

get_env(*self*)

get_env_scanner(*self*, *env*, *kw*={})

get_executor(*self*, *create*=1)

```
Fetch the action executor for this node.  Create one if
there isn't already one, and requested to do so.
```

get_found_includes(*self*, *env*, *scanner*, *path*)

```
Return the scanned include lines (implicit dependencies)
found in this node.

The default is no implicit dependencies.  We expect this method
to be overridden by any subclass that can be scanned for
implicit dependencies.
```

get_implicit_deps(*self*, *env*, *scanner*, *path*)

```
Return a list of implicit dependencies for this node.

This method exists to handle recursive invocation of the scanner
on the implicit dependencies returned by the scanner, if the
scanner's recursive flag says that we should.
```

get_ninfo(*self*)

get_source_scanner(*self*, *node*)

```
Fetch the source scanner for the specified node

NOTE:  "self" is the target being built, "node" is
the source file for which we want to fetch the scanner.

Implies self.has_builder() is true; again, expect to only be
called from locations where this is already verified.

This function may be called very often; it attempts to cache
the scanner found to improve performance.
```

get_state(*self*)

get_stored_implicit(*self*)

```
Fetch the stored implicit dependencies
```

get_stored_info(*self*)

get_string(*self*, *for_signature*)

```
This is a convenience function designed primarily to be
used in command generators (i.e., CommandGeneratorActions or
Environment variables that are callable), which are called
with a for_signature argument that is nonzero if the command
generator is being called to generate a signature for the
command line, which determines if we should rebuild or not.

Such command generators should use this method in preference
to str(Node) when converting a Node to a string, passing
in the for_signature parameter, such that we will call
Node.for_signature() or str(Node) properly, depending on whether
we are calculating a signature or actually constructing a
command line.
```

get_subst_proxy(*self*)

```
This method is expected to return an object that will function
exactly like this Node, except that it implements any additional
special features that we would like to be in effect for
Environment variable substitution.  The principle use is that
some Nodes would like to implement a __getattr__() method,
but putting that in the Node type itself has a tendency to kill
performance.  We instead put it in a proxy and return it from
this method.  It is legal for this method to return self
if no new functionality is needed for Environment substitution.
```

get_suffix(*self*)

get_target_scanner(*self*)

has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

has_explicit_builder(*self*)

```
Return whether this Node has an explicit builder

This allows an internal Builder created by SCons to be marked
non-explicit, so that it can be overridden by an explicit
builder that the user supplies (the canonical example being
directories).
```

is_derived(*self*)

```
Returns true iff this node is derived (i.e. built).

This should return true only for nodes whose path should be in
the variant directory when duplicate=0 and should contribute their build
signatures when they are used as source files to other derived files. For
example: source with source builders are not derived in this sense,
and hence should not return true.
```

is_literal(*self*)

```
Always pass the string representation of a Node to
the command interpreter literally.
```

is_up_to_date(*self*)

```
Default check for whether the Node is current: unknown Node
subtypes are always out of date, so they will always get built.
```

make_ready(*self*)

```
Get a Node ready for evaluation.

This is called before the Taskmaster decides if the Node is
up-to-date or not.  Overriding this method allows for a Node
subclass to be disambiguated if necessary, or for an implicit
source builder to be attached.
```

missing(*self*)

multiple_side_effect_has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

new_binfo(*self*)

new_ninfo(*self*)

postprocess(*self*)

```
Clean up anything we don't need to hang onto after we've
been built.
```

prepare(*self*)

```
Prepare for this Node to be built.

This is called after the Taskmaster has decided that the Node
is out-of-date and must be rebuilt, but before actually calling
the method to build the Node.

This default implementation checks that explicit or implicit
dependencies either exist or are derived, and initializes the
BuildInfo structure that will hold the information about how
this node is, uh, built.

(The existence of source files is checked separately by the
Executor, which aggregates checks for all of the targets built
by a specific action.)

Overriding this method allows for for a Node subclass to remove
the underlying file from the file system.  Note that subclass
methods should call this base class method to get the child
check and the BuildInfo structure.
```

push_to_cache(*self*)

```
Try to push a node into a cache
```

remove(*self*)

```
Remove this Node:  no-op by default.
```

render_include_tree(*self*)

```
Return a text representation, suitable for displaying to the
user, of the include tree for the sources of this node.
```

reset_executor(*self*)

```
Remove cached executor; forces recompute when needed.
```

retrieve_from_cache(*self*)

```
Try to retrieve the node's content from a cache

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff in
built().

Returns true iff the node was successfully retrieved.
```

rexists(*self*)

```
Does this node exist locally or in a repositiory?
```

scan(*self*)

```
Scan this node's dependents for implicit dependencies.
```

scanner_key(*self*)

select_scanner(*self*, *scanner*)

```
Selects a scanner for this Node.

This is a separate method so it can be overridden by Node
subclasses (specifically, Node.FS.Dir) that *must* use their
own Scanner and don't select one the Scanner.Selector that's
configured for the target.
```

set_always_build(*self*, *always_build*=1)

```
Set the Node's always_build value.
```

set_executor(*self*, *executor*)

```
Set the action executor for this node.
```

set_explicit(*self*, *is_explicit*)

set_nocache(*self*, *nocache*=1)

```
Set the Node's nocache value.
```

set_noclean(*self*, *noclean*=1)

```
Set the Node's noclean value.
```

set_precious(*self*, *precious*=1)

```
Set the Node's precious value.
```

set_specific_source(*self*, *source*)

set_state(*self*, *state*)

state_has_changed(*self*, *target*, *prev_ni*)

store_info(*self*)

```
Make the build signature permanent (that is, store it in the
.sconsign file or equivalent).
```

visited(*self*)

```
Called just after this node has been visited (with or
without a build).
```

13.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

13.6.3 Class Variables

Name	Description
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass
memoizer_counters	**Value:** []

13.7 Class NodeList

UserList.UserList
└ **SCons.Node.NodeList**

13.7.1 Methods

__str__(*self*)

__add__(*self*, *other*)

__cmp__(*self*, *other*)

__contains__(*self*, *item*)

__delitem__(*self*, *i*)

__delslice__(*self*, *i*, *j*)

__eq__(*self*, *other*)

__ge__(*self*, *other*)

__getitem__(*self*, *i*)

__getslice__(*self*, *i*, *j*)

__gt__(*self*, *other*)

__**iadd**__(*self*, *other*)

__**imul**__(*self*, *n*)

__**init**__(*self*, *initlist*=`False`)

__**le**__(*self*, *other*)

__**len**__(*self*)

__**lt**__(*self*, *other*)

__**mul**__(*self*, *n*)

__**ne**__(*self*, *other*)

__**radd**__(*self*, *other*)

__**repr**__(*self*)

__**rmul**__(*self*, *n*)

__**setitem**__(*self*, *i*, *item*)

__**setslice**__(*self*, *i*, *j*, *other*)

append(*self*, *item*)

count(*self*, *item*)

extend(*self*, *other*)

index(*self*, *item*, **args*)

insert(*self*, *i*, *item*)

pop(*self*, *i*=`-1`)

remove(*self*, *item*)

reverse(*self*)

sort(*self*, **args*, ***kwds*)

13.8 Class Walker

object
└ **SCons.Node.Walker**

```
An iterator for walking a Node tree.

This is depth-first, children are visited before the parent.
The Walker object can be initialized with any node, and
returns the next node on the descent with each get_next() call.
'kids_func' is an optional function that will be called to
get the children of a node instead of calling 'children'.
'cycle_func' is an optional function that will be called
when a cycle is detected.

This class does not get caught in node cycles caused, for example,
by C header file include loops.
```

13.8.1 Methods

__init__(*self*, *node*, *kids_func*=<function get_children at 0x849502c>, *cycle_func*=<function ignore_cycle at 0x84964c4>, *eval_func*=<function do_nothing at 0x84964fc>)
x.__init__(...) initializes x; see x.__class__.__doc__ for signature

Overrides: object.__init__ extit(inherited documentation)

get_next(*self*)

```
Return the next node for this walk of the tree.

This function is intentionally iterative, not recursive,
to sidestep any issues of stack size limitations.
```

is_done(*self*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__**reduce**__(*...*)

```
helper for pickle
```

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__**str**__(*x*)

```
str(x)
```

13.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

14 Module SCons.Node.Alias

```
scons.Node.Alias

Alias nodes.

This creates a hash of global Aliases (dummy targets).
```

14.1 Variables

Name	Description
__revision__	**Value:** `'src/engine/SCons/Node/Alias.py 5023 2010/06/14 22:05:46 ...`
default_ans	**Value:** {}

14.2 Class AliasNameSpace

UserDict.UserDict
└ **SCons.Node.Alias.AliasNameSpace**

14.2.1 Methods

Alias(*self*, *name*, ***kw*)

lookup(*self*, *name*, ***kw*)

__cmp__(*self*, *dict*)

__contains__(*self*, *key*)

__delitem__(*self*, *key*)

__getitem__(*self*, *key*)

__init__(*self*, *dict*=`False`, ***kwargs*)

__len__(*self*)

__repr__(*self*)

__setitem__(*self*, *key*, *item*)

clear(*self*)

copy(*self*)

fromkeys(*cls*, *iterable*, *value*=`False`)

get(*self*, *key*, *failobj*=`False`)

has_key(*self*, *key*)

items(*self*)

iteritems(*self*)

iterkeys(*self*)

itervalues(*self*)

keys(*self*)

pop(*self*, *key*, **args*)

popitem(*self*)

setdefault(*self*, *key*, *failobj*=`False`)

update(*self*, *dict*=`False`, ***kwargs*)

values(*self*)

14.3 Class AliasNodeInfo

```
The generic base class for signature information for a Node.

Node subclasses should subclass NodeInfoBase to provide their own
logic for dealing with their own Node-specific signature information.
```

14.3.1 Methods

str_to_node(*self*, *s*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *node*=`False`)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

convert(*self*, *node*, *val*)

format(*self*, *field_list*=`False`, *names*=`0`)

merge(*self*, *other*)

update(*self*, *node*)

14.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

14.3.3 Class Variables

Name	Description
current_version_id	**Value:** 1
field_list	**Value:** ['csig']

14.4 Class AliasBuildInfo

object
SCons.Node.BuildInfoBase
SCons.Node.Alias.AliasBuildInfo

```
The generic base class for build information for a Node.

This is what gets stored in a .sconsign file for each target file.
It contains a NodeInfo instance for this node (signature information
that's specific to the type of Node) and direct attributes for the
generic build stuff we have to track:  sources, explicit dependencies,
implicit dependencies, and action information.
```

14.4.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *node*=False)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value
```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

merge(*self*, *other*)

14.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

14.4.3 Class Variables

Name	Description
current_version_id	**Value:** 1

14.5 Class Alias

object
SCons.Node.Node
SCons.Node.Alias.Alias

14.5.1 Methods

__init__(*self*, *name*)
Overrides: SCons.Node.Node.__init__

str_for_display(*self*)

__str__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

make_ready(*self*)
`Get a Node ready for evaluation.`

`This is called before the Taskmaster decides if the Node is up-to-date or not. Overriding this method allows for a Node subclass to be disambiguated if necessary, or for an implicit source builder to be attached.`

Overrides: SCons.Node.Node.make_ready extit(inherited documentation)

really_build(*self*, ***kw*)

`Actually build the node.`

`This is called by the Taskmaster after it's decided that the Node is out-of-date and must be rebuilt, and after the prepare() method has gotten everything, uh, prepared.`

`This method is called from multiple threads in a parallel build, so only do thread safe stuff here. Do thread unsafe stuff in built().`

is_up_to_date(*self*)

`Alternate check for whether the Node is current: If all of our children were up-to-date, then this Node was up-to-date, too.`

`The SCons.Node.Alias and SCons.Node.Python.Value subclasses rebind their current() method to this method.`

Overrides: SCons.Node.Node.is_up_to_date

is_under(*self*, *dir*)

get_contents(*self*)

`The contents of an alias is the concatenation of the content signatures of all its sources.`

sconsign(*self*)

```
An Alias is not recorded in .sconsign files
```

changed_since_last_build(*self*, *target*, *prev_ni*)

```
Must be overridden in a specific subclass to return True if this
Node (a dependency) has changed since the last time it was used
to build the specified target.  prev_ni is this Node's state (for
example, its file timestamp, length, maybe content signature)
as of the last time the target was built.

Note that this method is called through the dependency, not the
target, because a dependency Node must be able to use its own
logic to decide if it changed.  For example, File Nodes need to
obey if we're configured to use timestamps, but Python Value Nodes
never use timestamps and always use the content.  If this method
were called through the target, then each Node's implementation
of this method would have to have more complicated logic to
handle all the different Node types on which it might depend.
```

Overrides: SCons.Node.Node.changed_since_last_build extit(inherited documentation)

build(*self*)

```
A "builder" for aliases.
```

Overrides: SCons.Node.Node.build

convert(*self*)

get_csig(*self*)

```
Generate a node's content signature, the digested signature
of its content.

node - the node
cache - alternate node to use for the signature cache
returns - the content signature
```

Overrides: SCons.Node.Node.get_csig

Decider(*self*, *function*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

add_dependency(*self*, *depend*)

```
Adds dependencies.
```

add_ignore(*self*, *depend*)

```
Adds dependencies to ignore.
```

add_prerequisite(*self*, *prerequisite*)

```
Adds prerequisites
```

add_source(*self*, *source*)

```
Adds sources.
```

add_to_implicit(*self*, *deps*)

add_to_waiting_parents(*self*, *node*)

```
Returns the number of nodes added to our waiting parents list:
1 if we add a unique waiting parent, 0 if not.  (Note that the
returned values are intended to be used to increment a reference
count, so don't think you can "clean up" this function by using
True and False instead...)
```

add_to_waiting_s_e(*self*, *node*)

add_wkid(*self*, *wkid*)

```
Add a node to the list of kids waiting to be evaluated
```

all_children(*self*, *scan*=1)

```
Return a list of all the node's direct children.
```

alter_targets(*self*)

```
Return a list of alternate targets for this Node.
```

builder_set(*self*, *builder*)

built(*self*)

```
Called just after this node is successfully built.
```

changed(*self*, *node*=False)

```
Returns if the node is up-to-date with respect to the BuildInfo
stored last time it was built.  The default behavior is to compare
it against our own previously stored BuildInfo, but the stored
BuildInfo from another Node (typically one in a Repository)
can be used instead.

Note that we now *always* check every dependency.  We used to
short-circuit the check by returning as soon as we detected
any difference, but we now rely on checking every dependency
to make sure that any necessary Node information (for example,
the content signature of an #included .h file) is updated.
```

children(*self*, *scan*=1)

```
Return a list of the node's direct children, minus those
that are ignored by this node.
```

children_are_up_to_date(*self*)

```
Alternate check for whether the Node is current:  If all of
our children were up-to-date, then this Node was up-to-date, too.

The SCons.Node.Alias and SCons.Node.Python.Value subclasses
rebind their current() method to this method.
```

clear(*self*)

```
Completely clear a Node of all its cached state (so that it
can be re-evaluated by interfaces that do continuous integration
builds).
```

clear_memoized_values(*self*)

del_binfo(*self*)

```
Delete the build info from this node.
```

disambiguate(*self*, *must_exist*=False)

do_not_store_info(*self*)

env_set(*self*, *env*, *safe*=0)

executor_cleanup(*self*)

```
Let the executor clean up any cached information.
```

exists(*self*)

```
Does this node exists?
```

explain(*self*)

for_signature(*self*)

```
Return a string representation of the Node that will always
be the same for this particular Node, no matter what.  This
is by contrast to the __str__() method, which might, for
instance, return a relative path for a file Node.  The purpose
of this method is to generate a value to be used in signature
calculation for the command line used to build a target, and
we use this method instead of str() to avoid unnecessary
rebuilds.  This method does not need to return something that
would actually work in a command line; it can return any kind of
nonsense, so long as it does not change.
```

get_abspath(*self*)

```
Return an absolute path to the Node.  This will return simply
str(Node) by default, but for Node types that have a concept of
relative path, this might return something different.
```

get_binfo(*self*)

```
Fetch a node's build information.

node - the node whose sources will be collected
cache - alternate node to use for the signature cache
returns - the build signature

This no longer handles the recursive descent of the
node's children's signatures.  We expect that they're
already built and updated by someone else, if that's
what's wanted.
```

get_build_env(*self*)

```
Fetch the appropriate Environment to build this node.
```

get_build_scanner_path(*self*, *scanner*)

```
Fetch the appropriate scanner path for this node.
```

get_builder(*self*, *default_builder*=False)

```
Return the set builder, or a specified default value
```

get_cachedir_csig(*self*)

get_env(*self*)

get_env_scanner(*self*, *env*, *kw*={})

get_executor(*self*, *create*=1)

```
Fetch the action executor for this node.  Create one if
there isn't already one, and requested to do so.
```

get_found_includes(*self*, *env*, *scanner*, *path*)

```
Return the scanned include lines (implicit dependencies)
found in this node.

The default is no implicit dependencies.  We expect this method
to be overridden by any subclass that can be scanned for
implicit dependencies.
```

get_implicit_deps(*self*, *env*, *scanner*, *path*)

```
Return a list of implicit dependencies for this node.

This method exists to handle recursive invocation of the scanner
on the implicit dependencies returned by the scanner, if the
scanner's recursive flag says that we should.
```

get_ninfo(*self*)

get_source_scanner(*self*, *node*)

```
Fetch the source scanner for the specified node

NOTE:  "self" is the target being built, "node" is
the source file for which we want to fetch the scanner.

Implies self.has_builder() is true; again, expect to only be
called from locations where this is already verified.

This function may be called very often; it attempts to cache
the scanner found to improve performance.
```

get_state(*self*)

get_stored_implicit(*self*)

```
Fetch the stored implicit dependencies
```

get_stored_info(*self*)

get_string(*self*, *for_signature*)

```
This is a convenience function designed primarily to be
used in command generators (i.e., CommandGeneratorActions or
Environment variables that are callable), which are called
with a for_signature argument that is nonzero if the command
generator is being called to generate a signature for the
command line, which determines if we should rebuild or not.

Such command generators should use this method in preference
to str(Node) when converting a Node to a string, passing
in the for_signature parameter, such that we will call
Node.for_signature() or str(Node) properly, depending on whether
we are calculating a signature or actually constructing a
command line.
```

get_subst_proxy(*self*)

```
This method is expected to return an object that will function
exactly like this Node, except that it implements any additional
special features that we would like to be in effect for
Environment variable substitution.  The principle use is that
some Nodes would like to implement a __getattr__() method,
but putting that in the Node type itself has a tendency to kill
performance.  We instead put it in a proxy and return it from
this method.  It is legal for this method to return self
if no new functionality is needed for Environment substitution.
```

get_suffix(*self*)

get_target_scanner(*self*)

has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

has_explicit_builder(*self*)

```
Return whether this Node has an explicit builder

This allows an internal Builder created by SCons to be marked
non-explicit, so that it can be overridden by an explicit
builder that the user supplies (the canonical example being
directories).
```

is_derived(*self*)

```
Returns true iff this node is derived (i.e. built).

This should return true only for nodes whose path should be in
the variant directory when duplicate=0 and should contribute their build
signatures when they are used as source files to other derived files. For
example: source with source builders are not derived in this sense,
and hence should not return true.
```

is_literal(*self*)

```
Always pass the string representation of a Node to
the command interpreter literally.
```

missing(*self*)

multiple_side_effect_has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

new_binfo(*self*)

new_ninfo(*self*)

postprocess(*self*)

```
Clean up anything we don't need to hang onto after we've
been built.
```

prepare(*self*)

```
Prepare for this Node to be built.

This is called after the Taskmaster has decided that the Node
is out-of-date and must be rebuilt, but before actually calling
the method to build the Node.

This default implementation checks that explicit or implicit
dependencies either exist or are derived, and initializes the
BuildInfo structure that will hold the information about how
this node is, uh, built.

(The existence of source files is checked separately by the
Executor, which aggregates checks for all of the targets built
by a specific action.)

Overriding this method allows for for a Node subclass to remove
the underlying file from the file system.  Note that subclass
methods should call this base class method to get the child
check and the BuildInfo structure.
```

push_to_cache(*self*)

```
Try to push a node into a cache
```

remove(*self*)

```
Remove this Node:  no-op by default.
```

render_include_tree(*self*)

```
Return a text representation, suitable for displaying to the
user, of the include tree for the sources of this node.
```

reset_executor(*self*)

```
Remove cached executor; forces recompute when needed.
```

retrieve_from_cache(*self*)

```
Try to retrieve the node's content from a cache

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff in
built().

Returns true iff the node was successfully retrieved.
```

rexists(*self*)

```
Does this node exist locally or in a repositiory?
```

scan(*self*)

```
Scan this node's dependents for implicit dependencies.
```

scanner_key(*self*)

select_scanner(*self*, *scanner*)

```
Selects a scanner for this Node.

This is a separate method so it can be overridden by Node
subclasses (specifically, Node.FS.Dir) that *must* use their
own Scanner and don't select one the Scanner.Selector that's
configured for the target.
```

set_always_build(*self*, *always_build*=1)

```
Set the Node's always_build value.
```

set_executor(*self*, *executor*)

```
Set the action executor for this node.
```

set_explicit(*self*, *is_explicit*)

set_nocache(*self*, *nocache*=1)

```
Set the Node's nocache value.
```

set_noclean(*self*, *noclean*=1)

```
Set the Node's noclean value.
```

set_precious(*self*, *precious*=1)

```
Set the Node's precious value.
```

set_specific_source(*self*, *source*)

set_state(*self*, *state*)

state_has_changed(*self*, *target*, *prev_ni*)

store_info(*self*)

```
Make the build signature permanent (that is, store it in the
.sconsign file or equivalent).
```

visited(*self*)

```
Called just after this node has been visited (with or
without a build).
```

14.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

14.5.3 Class Variables

Name	Description
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass
memoizer_counters	**Value:** []

15 Module SCons.Node.FS

```
scons.Node.FS

File system nodes.

These Nodes represent the canonical external objects that people think
of when they think of building software: files and directories.

This holds a "default_fs" variable that should be initialized with an FS
that can be used by scripts or modules looking for the canonical default.
```

15.1 Functions

save_strings(*val*)

initialize_do_splitdrive()

initialize_normpath_check()

```
Initialize the normpath_check regular expression.

This function is used by the unit tests to re-initialize the pattern
when testing for behavior with different values of os.sep.
```

set_duplicate(*duplicate*)

LinkFunc(*target*, *source*, *env*)

LocalString(*target*, *source*, *env*)

UnlinkFunc(*target*, *source*, *env*)

MkdirFunc(*target*, *source*, *env*)

get_MkdirBuilder()

get_DefaultSCCSBuilder()

get_DefaultRCSBuilder()

do_diskcheck_match(*node*, *predicate*, *errorfmt*)

ignore_diskcheck_match(*node*, *predicate*, *errorfmt*)

do_diskcheck_rcs(*node*, *name*)

ignore_diskcheck_rcs(*node*, *name*)

do_diskcheck_sccs(*node*, *name*)

ignore_diskcheck_sccs(*node*, *name*)

set_diskcheck(*list*)

diskcheck_types()

has_glob_magic(*s*)

get_default_fs()

find_file(*filename*, *paths*, *verbose*=`False`)

```
find_file(str, [Dir()]) -> [nodes]

filename - a filename to find
paths - a list of directory path *nodes* to search in.  Can be
        represented as a list, a tuple, or a callable that is
        called with no arguments and returns the list or tuple.

returns - the node created from the found file.

Find a node corresponding to either a derived file or a file
that exists already.

Only the first file found is returned, and none is returned
if no file is found.
```

invalidate_node_memos(*targets*)

```
Invalidate the memoized values of all Nodes (files or directories)
that are associated with the given entries. Has been added to
clear the cache of nodes affected by a direct execution of an
action (e.g.  Delete/Copy/Chmod). Existing Node caches become
inconsistent if the action is run through Execute().  The argument
‘targets‘ can be a single Node object or filename, or a sequence
of Nodes/filenames.
```

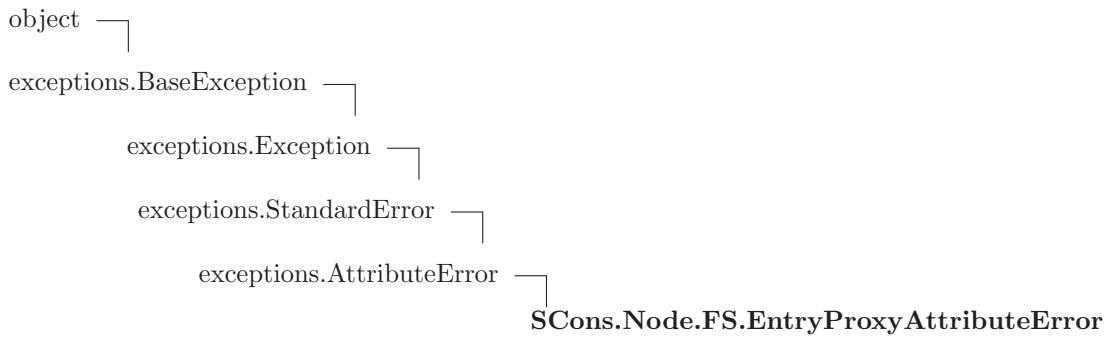
15.2 Variables

Name	Description
__revision__	**Value:** `'src/engine/SCons/Node/FS.py 5023 2010/06/14 22:05:46 scons'`

continued on next page

Name	Description
do_store_info	**Value:** `True`
default_max_drift	**Value:** `172800`
Save_Strings	**Value:** `False`
do_splitdrive	**Value:** `False`
needs_normpath_check	**Value:** `False`
Valid_Duplicates	**Value:** `['hard-soft-copy', 'soft-hard-copy', 'hard-copy', 'soft-c...`
Link_Funcs	**Value:** `[]`
Link	**Value:** `SCons.Action.Action(LinkFunc, None)`
LocalCopy	**Value:** `SCons.Action.Action(LinkFunc, LocalString)`
Unlink	**Value:** `SCons.Action.Action(UnlinkFunc, None)`
Mkdir	**Value:** `SCons.Action.Action(MkdirFunc, None, presub=None)`
MkdirBuilder	**Value:** `False`
DefaultSCCSBuilder	**Value:** `False`
DefaultRCSBuilder	**Value:** `False`
diskcheck_match	**Value:** `DiskChecker('match', do_diskcheck_match, ignore_diskcheck...`
diskcheck_rcs	**Value:** `DiskChecker('rcs', do_diskcheck_rcs, ignore_diskcheck_rcs)`
diskcheck_sccs	**Value:** `DiskChecker('sccs', do_diskcheck_sccs, ignore_diskcheck_s...`
diskcheckers	**Value:** `[diskcheck_match, diskcheck_rcs, diskcheck_sccs,]`
glob_magic_check	**Value:** `re.compile(r'[\*\?\[]')`
default_fs	**Value:** `False`

15.3 Class EntryProxyAttributeError




```
An AttributeError subclass for recording and displaying the name
of the underlying Entry involved in an AttributeError exception.
```

15.3.1 Methods

__init__(*self*, *entry_proxy*, *attribute*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: exceptions.AttributeError.__init__ extit(inherited documentation)

__str__(*self*)
```
str(x)
```
Overrides: exceptions.BaseException.__str__ extit(inherited documentation)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```
Overrides: object.__delattr__

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```
Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value
```
    a new object with type S, a subtype of T
```
Overrides: exceptions.StandardError.__new__

__reduce__(*...*)
```
helper for pickle
```
Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```
Overrides: object.__repr__

__setattr__(...)

`x.__setattr__('name', value) <==> x.name = value`

Overrides: object.__setattr__

__setstate__(...)

15.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

15.4 Class DiskChecker

object
└ **SCons.Node.FS.DiskChecker**

15.4.1 Methods

__init__(*self*, *type*, *do*, *ignore*)

`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__call__(*self*, **args*, ***kw*)

set(*self*, *list*)

__delattr__(...)

`x.__delattr__('name') <==> del x.name`

__getattribute__(...)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__**new**__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__**reduce**__(...)

```
helper for pickle
```

__**reduce_ex**__(...)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

__**setattr**__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__**str**__(*x*)

```
str(x)
```

15.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.5 Class EntryProxy

object
SCons.Util.Proxy
SCons.Node.FS.EntryProxy

15.5.1 Methods

__**str**__(...)

```
A Python Descriptor class that delegates attribute fetches
to an underlying wrapped subject of a Proxy.  Typical use:

    class Foo(Proxy):
        __str__ = Delegate('__str__')
```

Overrides: object.__str__

__getattr__(*self*, *name*)

```
Retrieve an attribute from the wrapped object.  If the named
attribute doesn't exist, AttributeError is raised
```

Overrides: SCons.Util.Proxy.__getattr__ extit(inherited documentation)

__cmp__(*self*, *other*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *subject*)

```
Wrap an object as a Proxy object
```

Overrides: object.__init__

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

get(*self*)

```
Retrieve the entire wrapped object
```

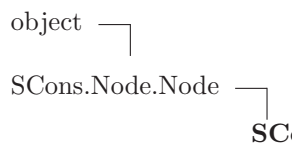
15.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.5.3 Class Variables

Name	Description
dictSpecialAttrs	**Value:** {'abspath': <function __get_abspath at 0x8509f0c>, 'base'...

15.6 Class Base



Known Subclasses: SCons.Node.FS.Dir, SCons.Node.FS.Entry, SCons.Node.FS.File

```
A generic class for file system entries.  This class is for
when we don't know yet whether the entry being looked up is a file
or a directory.  Instances of this class can morph into either
Dir or File objects by a later, more precise lookup.

Note: this class does not define __cmp__ and __hash__ for
efficiency reasons.  SCons does a lot of comparing of
Node.FS.{Base,Entry,File,Dir} objects, so those operations must be
as fast as possible, which means we want to use Python's built-in
object identity comparisons.
```

15.6.1 Methods

__init__(*self*, *name*, *directory*, *fs*)

```
Initialize a generic Node.FS.Base object.

Call the superclass initialization, take care of setting up
our relative and absolute paths, identify our parent
directory, and indicate that this node should use
signatures.
```

Overrides: SCons.Node.Node.__init__

str_for_display(*self*)

must_be_same(*self*, *klass*)

```
This node, which already existed, is being looked up as the
specified klass.  Raise an exception if it isn't.
```

get_dir(*self*)

get_suffix(*self*)
Overrides: SCons.Node.Node.get_suffix

rfile(*self*)

__str__(*self*)

```
A Node.FS.Base object's string representation is its path
name.
```

Overrides: object.__str__

rstr(*self*)

```
A Node.FS.Base object's string representation is its path
name.
```

stat(*self*)

exists(*self*)
`Does this node exists?`

Overrides: SCons.Node.Node.exists extit(inherited documentation)

rexists(*self*)
`Does this node exist locally or in a repositiory?`

Overrides: SCons.Node.Node.rexists extit(inherited documentation)

getmtime(*self*)

getsize(*self*)

isdir(*self*)

isfile(*self*)

islink(*self*)

is_under(*self*, *dir*)

set_local(*self*)

srcnode(*self*)

```
If this node is in a build path, return the node
corresponding to its source file.  Otherwise, return
ourself.
```

get_path(*self*, *dir*=False)

```
Return path relative to the current working directory of the
Node.FS.Base object that owns us.
```

set_src_builder(*self*, *builder*)

```
Set the source code builder for this node.
```

src_builder(*self*)

```
Fetch the source code builder for this node.

If there isn't one, we cache the source code builder specified
for the directory (which in turn will cache the value from its
parent directory, and so on up to the file system root).
```

get_abspath(*self*)

```
Get the absolute path of the file.
```

Overrides: SCons.Node.Node.get_abspath

for_signature(*self*)

```
Return a string representation of the Node that will always
be the same for this particular Node, no matter what.  This
is by contrast to the __str__() method, which might, for
instance, return a relative path for a file Node.  The purpose
of this method is to generate a value to be used in signature
calculation for the command line used to build a target, and
we use this method instead of str() to avoid unnecessary
rebuilds.  This method does not need to return something that
would actually work in a command line; it can return any kind of
nonsense, so long as it does not change.
```

Overrides: SCons.Node.Node.for_signature extit(inherited documentation)

get_subst_proxy(*self*)

```
This method is expected to return an object that will function
exactly like this Node, except that it implements any additional
special features that we would like to be in effect for
Environment variable substitution.  The principle use is that
some Nodes would like to implement a __getattr__() method,
but putting that in the Node type itself has a tendency to kill
performance.  We instead put it in a proxy and return it from
this method.  It is legal for this method to return self
if no new functionality is needed for Environment substitution.
```

Overrides: SCons.Node.Node.get_subst_proxy extit(inherited documentation)

target_from_source(*self*, *prefix*, *suffix*, *splitext*=<function splitext at 0x8415c34>)

```
Generates a target entry that corresponds to this entry (usually
a source file) with the specified prefix and suffix.

Note that this method can be overridden dynamically for generated
files that need different behavior.  See Tool/swig.py for
an example.
```

Rfindalldirs(*self*, *pathlist*)

```
Return all of the directories for a given path list, including
corresponding "backing" directories in any repositories.

The Node lookups are relative to this Node (typically a
directory), so memoizing result saves cycles from looking
up the same path for each target in a given directory.
```

RDirs(*self*, *pathlist*)

```
Search for a list of directories in the Repository list.
```

rentry(*self*)

Decider(*self*, *function*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

add_dependency(*self*, *depend*)

```
Adds dependencies.
```

add_ignore(*self*, *depend*)

```
Adds dependencies to ignore.
```

add_prerequisite(*self*, *prerequisite*)

```
Adds prerequisites
```

add_source(*self*, *source*)

```
Adds sources.
```

add_to_implicit(*self*, *deps*)

add_to_waiting_parents(*self*, *node*)

```
Returns the number of nodes added to our waiting parents list:
1 if we add a unique waiting parent, 0 if not.  (Note that the
returned values are intended to be used to increment a reference
count, so don't think you can "clean up" this function by using
True and False instead...)
```

add_to_waiting_s_e(*self*, *node*)

add_wkid(*self*, *wkid*)

```
Add a node to the list of kids waiting to be evaluated
```

all_children(*self*, *scan*=1)

```
Return a list of all the node's direct children.
```

alter_targets(*self*)

```
Return a list of alternate targets for this Node.
```

build(*self*, ***kw*)

```
Actually build the node.

This is called by the Taskmaster after it's decided that the
Node is out-of-date and must be rebuilt, and after the prepare()
method has gotten everything, uh, prepared.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff
in built().
```

builder_set(*self*, *builder*)

built(*self*)

```
Called just after this node is successfully built.
```

changed(*self*, *node*=False)

```
Returns if the node is up-to-date with respect to the BuildInfo
stored last time it was built.  The default behavior is to compare
it against our own previously stored BuildInfo, but the stored
BuildInfo from another Node (typically one in a Repository)
can be used instead.

Note that we now *always* check every dependency.  We used to
short-circuit the check by returning as soon as we detected
any difference, but we now rely on checking every dependency
to make sure that any necessary Node information (for example,
the content signature of an #included .h file) is updated.
```

changed_since_last_build(*self*, *target*, *prev_ni*)

```
Must be overridden in a specific subclass to return True if this
Node (a dependency) has changed since the last time it was used
to build the specified target.  prev_ni is this Node's state (for
example, its file timestamp, length, maybe content signature)
as of the last time the target was built.

Note that this method is called through the dependency, not the
target, because a dependency Node must be able to use its own
logic to decide if it changed.  For example, File Nodes need to
obey if we're configured to use timestamps, but Python Value Nodes
never use timestamps and always use the content.  If this method
were called through the target, then each Node's implementation
of this method would have to have more complicated logic to
handle all the different Node types on which it might depend.
```

children(*self*, *scan*=1)

```
Return a list of the node's direct children, minus those
that are ignored by this node.
```

children_are_up_to_date(*self*)

```
Alternate check for whether the Node is current:  If all of
our children were up-to-date, then this Node was up-to-date, too.

The SCons.Node.Alias and SCons.Node.Python.Value subclasses
rebind their current() method to this method.
```

clear(*self*)

```
Completely clear a Node of all its cached state (so that it
can be re-evaluated by interfaces that do continuous integration
builds).
```

clear_memoized_values(*self*)

del_binfo(*self*)

```
Delete the build info from this node.
```

disambiguate(*self*, *must_exist*=False)

do_not_store_info(*self*)

env_set(*self*, *env*, *safe*=0)

executor_cleanup(*self*)

```
Let the executor clean up any cached information.
```

explain(*self*)

get_binfo(*self*)

```
Fetch a node's build information.

node - the node whose sources will be collected
cache - alternate node to use for the signature cache
returns - the build signature

This no longer handles the recursive descent of the
node's children's signatures.  We expect that they're
already built and updated by someone else, if that's
what's wanted.
```

get_build_env(*self*)

```
Fetch the appropriate Environment to build this node.
```

get_build_scanner_path(*self*, *scanner*)

```
Fetch the appropriate scanner path for this node.
```

get_builder(*self*, *default_builder*=False)

```
Return the set builder, or a specified default value
```

get_cachedir_csig(*self*)

get_csig(*self*)

get_env(*self*)

get_env_scanner(*self*, *env*, *kw*={})

get_executor(*self*, *create*=1)

```
Fetch the action executor for this node.  Create one if
there isn't already one, and requested to do so.
```

get_found_includes(*self*, *env*, *scanner*, *path*)

```
Return the scanned include lines (implicit dependencies)
found in this node.

The default is no implicit dependencies.  We expect this method
to be overridden by any subclass that can be scanned for
implicit dependencies.
```

get_implicit_deps(*self*, *env*, *scanner*, *path*)

```
Return a list of implicit dependencies for this node.

This method exists to handle recursive invocation of the scanner
on the implicit dependencies returned by the scanner, if the
scanner's recursive flag says that we should.
```

get_ninfo(*self*)

get_source_scanner(*self*, *node*)

```
Fetch the source scanner for the specified node

NOTE:  "self" is the target being built, "node" is
the source file for which we want to fetch the scanner.

Implies self.has_builder() is true; again, expect to only be
called from locations where this is already verified.

This function may be called very often; it attempts to cache
the scanner found to improve performance.
```

get_state(*self*)

get_stored_implicit(*self*)

```
Fetch the stored implicit dependencies
```

get_stored_info(*self*)

get_string(*self*, *for_signature*)

```
This is a convenience function designed primarily to be
used in command generators (i.e., CommandGeneratorActions or
Environment variables that are callable), which are called
with a for_signature argument that is nonzero if the command
generator is being called to generate a signature for the
command line, which determines if we should rebuild or not.

Such command generators should use this method in preference
to str(Node) when converting a Node to a string, passing
in the for_signature parameter, such that we will call
Node.for_signature() or str(Node) properly, depending on whether
we are calculating a signature or actually constructing a
command line.
```

get_target_scanner(*self*)

has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

has_explicit_builder(*self*)

```
Return whether this Node has an explicit builder

This allows an internal Builder created by SCons to be marked
non-explicit, so that it can be overridden by an explicit
builder that the user supplies (the canonical example being
directories).
```

is_derived(*self*)

```
Returns true iff this node is derived (i.e. built).

This should return true only for nodes whose path should be in
the variant directory when duplicate=0 and should contribute their build
signatures when they are used as source files to other derived files. For
example: source with source builders are not derived in this sense,
and hence should not return true.
```

is_literal(*self*)

```
Always pass the string representation of a Node to
the command interpreter literally.
```

is_up_to_date(*self*)

```
Default check for whether the Node is current: unknown Node
subtypes are always out of date, so they will always get built.
```

make_ready(*self*)

```
Get a Node ready for evaluation.

This is called before the Taskmaster decides if the Node is
up-to-date or not.  Overriding this method allows for a Node
subclass to be disambiguated if necessary, or for an implicit
source builder to be attached.
```

missing(*self*)

multiple_side_effect_has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

new_binfo(*self*)

new_ninfo(*self*)

postprocess(*self*)

```
Clean up anything we don't need to hang onto after we've
been built.
```

prepare(*self*)

```
Prepare for this Node to be built.

This is called after the Taskmaster has decided that the Node
is out-of-date and must be rebuilt, but before actually calling
the method to build the Node.

This default implementation checks that explicit or implicit
dependencies either exist or are derived, and initializes the
BuildInfo structure that will hold the information about how
this node is, uh, built.

(The existence of source files is checked separately by the
Executor, which aggregates checks for all of the targets built
by a specific action.)

Overriding this method allows for for a Node subclass to remove
the underlying file from the file system.  Note that subclass
methods should call this base class method to get the child
check and the BuildInfo structure.
```

push_to_cache(*self*)

```
Try to push a node into a cache
```

remove(*self*)

```
Remove this Node:  no-op by default.
```

render_include_tree(*self*)

```
Return a text representation, suitable for displaying to the
user, of the include tree for the sources of this node.
```

reset_executor(*self*)

```
Remove cached executor; forces recompute when needed.
```

retrieve_from_cache(*self*)

```
Try to retrieve the node's content from a cache

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff in
built().

Returns true iff the node was successfully retrieved.
```

scan(*self*)

```
Scan this node's dependents for implicit dependencies.
```

scanner_key(*self*)

select_scanner(*self*, *scanner*)

```
Selects a scanner for this Node.

This is a separate method so it can be overridden by Node
subclasses (specifically, Node.FS.Dir) that *must* use their
own Scanner and don't select one the Scanner.Selector that's
configured for the target.
```

set_always_build(*self*, *always_build*=1)

```
Set the Node's always_build value.
```

set_executor(*self*, *executor*)

```
Set the action executor for this node.
```

set_explicit(*self*, *is_explicit*)

set_nocache(*self*, *nocache*=1)

```
Set the Node's nocache value.
```

set_noclean(*self*, *noclean*=1)

```
Set the Node's noclean value.
```

set_precious(*self*, *precious*=1)

```
Set the Node's precious value.
```

set_specific_source(*self*, *source*)

set_state(*self*, *state*)

state_has_changed(*self*, *target*, *prev_ni*)

store_info(*self*)

```
Make the build signature permanent (that is, store it in the
.sconsign file or equivalent).
```

visited(*self*)

```
Called just after this node has been visited (with or
without a build).
```

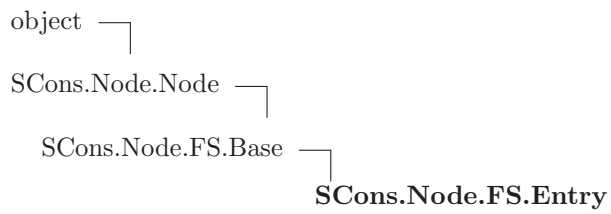
15.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.6.3 Class Variables

Name	Description
memoizer_counters	**Value:** []
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass

15.7 Class Entry




```
This is the class for generic Node.FS entries--that is, things
that could be a File or a Dir, but we're just not sure yet.
Consequently, the methods in this class really exist just to
transform their associated object into the right class when the
time comes, and then call the same-named method in the transformed
class.
```

15.7.1 Methods

diskcheck_match(*self*)

disambiguate(*self*, *must_exist*=False)

Overrides: SCons.Node.Node.disambiguate

rfile(*self*)

```
We're a generic Entry, but the caller is actually looking for
a File at this point, so morph into one.
```

Overrides: SCons.Node.FS.Base.rfile

scanner_key(*self*)
Overrides: SCons.Node.Node.scanner_key

get_contents(*self*)

```
Fetch the contents of the entry.  Returns the exact binary
contents of the file.
```

get_text_contents(*self*)

```
Fetch the decoded text contents of a Unicode encoded Entry.

Since this should return the text contents from the file
system, we check to see into what sort of subclass we should
morph this Entry.
```

must_be_same(*self*, *klass*)

```
Called to make sure a Node is a Dir.  Since we're an
Entry, we can morph into one.
```

Overrides: SCons.Node.FS.Base.must_be_same

exists(*self*)

```
Return if the Entry exists.  Check the file system to see
what we should turn into first.  Assume a file if there's no
directory.
```

Overrides: SCons.Node.FS.Base.exists

rel_path(*self*, *other*)

new_ninfo(*self*)
Overrides: SCons.Node.Node.new_ninfo

changed_since_last_build(*self*, *target*, *prev_ni*)

```
Must be overridden in a specific subclass to return True if this
Node (a dependency) has changed since the last time it was used
to build the specified target.  prev_ni is this Node's state (for
example, its file timestamp, length, maybe content signature)
as of the last time the target was built.

Note that this method is called through the dependency, not the
target, because a dependency Node must be able to use its own
logic to decide if it changed.  For example, File Nodes need to
obey if we're configured to use timestamps, but Python Value Nodes
never use timestamps and always use the content.  If this method
were called through the target, then each Node's implementation
of this method would have to have more complicated logic to
handle all the different Node types on which it might depend.
```

Overrides: SCons.Node.Node.changed_since_last_build extit(inherited documentation)

get_subst_proxy(*self*)

```
This method is expected to return an object that will function
exactly like this Node, except that it implements any additional
special features that we would like to be in effect for
Environment variable substitution.  The principle use is that
some Nodes would like to implement a __getattr__() method,
but putting that in the Node type itself has a tendency to kill
performance.  We instead put it in a proxy and return it from
this method.  It is legal for this method to return self
if no new functionality is needed for Environment substitution.
```

Overrides: SCons.Node.FS.Base.get_subst_proxy

Decider(*self*, *function*)

RDirs(*self*, *pathlist*)

```
Search for a list of directories in the Repository list.
```

Rfindalldirs(*self*, *pathlist*)

```
Return all of the directories for a given path list, including
corresponding "backing" directories in any repositories.

The Node lookups are relative to this Node (typically a
directory), so memoizing result saves cycles from looking
up the same path for each target in a given directory.
```

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *name*, *directory*, *fs*)

```
Initialize a generic Node.FS.Base object.

Call the superclass initialization, take care of setting up
our relative and absolute paths, identify our parent
directory, and indicate that this node should use
signatures.
```

Overrides: SCons.Node.Node.__init__

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*self*)

```
A Node.FS.Base object's string representation is its path
name.
```

Overrides: object.__str__

add_dependency(*self*, *depend*)

```
Adds dependencies.
```

add_ignore(*self*, *depend*)

```
Adds dependencies to ignore.
```

add_prerequisite(*self*, *prerequisite*)

```
Adds prerequisites
```

add_source(*self*, *source*)

```
Adds sources.
```

add_to_implicit(*self*, *deps*)

add_to_waiting_parents(*self*, *node*)

```
Returns the number of nodes added to our waiting parents list:
1 if we add a unique waiting parent, 0 if not.  (Note that the
returned values are intended to be used to increment a reference
count, so don't think you can "clean up" this function by using
True and False instead...)
```

add_to_waiting_s_e(*self*, *node*)

add_wkid(*self*, *wkid*)

```
Add a node to the list of kids waiting to be evaluated
```

all_children(*self*, *scan*=1)

```
Return a list of all the node's direct children.
```

alter_targets(*self*)

```
Return a list of alternate targets for this Node.
```

build(*self*, ***kw*)

```
Actually build the node.

This is called by the Taskmaster after it's decided that the
Node is out-of-date and must be rebuilt, and after the prepare()
method has gotten everything, uh, prepared.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff
in built().
```

builder_set(*self*, *builder*)

built(*self*)

```
Called just after this node is successfully built.
```

changed(*self*, *node*=False)

```
Returns if the node is up-to-date with respect to the BuildInfo
stored last time it was built.  The default behavior is to compare
it against our own previously stored BuildInfo, but the stored
BuildInfo from another Node (typically one in a Repository)
can be used instead.

Note that we now *always* check every dependency.  We used to
short-circuit the check by returning as soon as we detected
any difference, but we now rely on checking every dependency
to make sure that any necessary Node information (for example,
the content signature of an #included .h file) is updated.
```

children(*self*, *scan*=1)

```
Return a list of the node's direct children, minus those
that are ignored by this node.
```

children_are_up_to_date(*self*)

```
Alternate check for whether the Node is current:  If all of
our children were up-to-date, then this Node was up-to-date, too.

The SCons.Node.Alias and SCons.Node.Python.Value subclasses
rebind their current() method to this method.
```

clear(*self*)

```
Completely clear a Node of all its cached state (so that it
can be re-evaluated by interfaces that do continuous integration
builds).
```

clear_memoized_values(*self*)

del_binfo(*self*)

Delete the build info from this node.

do_not_store_info(*self*)

env_set(*self*, *env*, *safe*=0)

executor_cleanup(*self*)

Let the executor clean up any cached information.

explain(*self*)

for_signature(*self*)

Return a string representation of the Node that will always
be the same for this particular Node, no matter what. This
is by contrast to the __str__() method, which might, for
instance, return a relative path for a file Node. The purpose
of this method is to generate a value to be used in signature
calculation for the command line used to build a target, and
we use this method instead of str() to avoid unnecessary
rebuilds. This method does not need to return something that
would actually work in a command line; it can return any kind of
nonsense, so long as it does not change.

Overrides: SCons.Node.Node.for_signature extit(inherited documentation)

get_abspath(*self*)

Get the absolute path of the file.

Overrides: SCons.Node.Node.get_abspath

get_binfo(*self*)

Fetch a node's build information.

node - the node whose sources will be collected
cache - alternate node to use for the signature cache
returns - the build signature

This no longer handles the recursive descent of the
node's children's signatures. We expect that they're
already built and updated by someone else, if that's
what's wanted.

get_build_env(*self*)

```
Fetch the appropriate Environment to build this node.
```

get_build_scanner_path(*self*, *scanner*)

```
Fetch the appropriate scanner path for this node.
```

get_builder(*self*, *default_builder*=False)

```
Return the set builder, or a specified default value
```

get_cachedir_csig(*self*)

get_csig(*self*)

get_dir(*self*)

get_env(*self*)

get_env_scanner(*self*, *env*, *kw*={})

get_executor(*self*, *create*=1)

```
Fetch the action executor for this node.  Create one if
there isn't already one, and requested to do so.
```

get_found_includes(*self*, *env*, *scanner*, *path*)

```
Return the scanned include lines (implicit dependencies)
found in this node.

The default is no implicit dependencies.  We expect this method
to be overridden by any subclass that can be scanned for
implicit dependencies.
```

get_implicit_deps(*self*, *env*, *scanner*, *path*)

```
Return a list of implicit dependencies for this node.

This method exists to handle recursive invocation of the scanner
on the implicit dependencies returned by the scanner, if the
scanner's recursive flag says that we should.
```

get_ninfo(*self*)

get_path(*self*, *dir*=False)

```
Return path relative to the current working directory of the
Node.FS.Base object that owns us.
```

get_source_scanner(*self*, *node*)

```
Fetch the source scanner for the specified node

NOTE:  "self" is the target being built, "node" is
the source file for which we want to fetch the scanner.

Implies self.has_builder() is true; again, expect to only be
called from locations where this is already verified.

This function may be called very often; it attempts to cache
the scanner found to improve performance.
```

get_state(*self*)

get_stored_implicit(*self*)

```
Fetch the stored implicit dependencies
```

get_stored_info(*self*)

get_string(*self*, *for_signature*)

```
This is a convenience function designed primarily to be
used in command generators (i.e., CommandGeneratorActions or
Environment variables that are callable), which are called
with a for_signature argument that is nonzero if the command
generator is being called to generate a signature for the
command line, which determines if we should rebuild or not.

Such command generators should use this method in preference
to str(Node) when converting a Node to a string, passing
in the for_signature parameter, such that we will call
Node.for_signature() or str(Node) properly, depending on whether
we are calculating a signature or actually constructing a
command line.
```

get_suffix(*self*)
Overrides: SCons.Node.Node.get_suffix

get_target_scanner(*self*)

getmtime(*self*)

getsize(*self*)

has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

has_explicit_builder(*self*)

```
Return whether this Node has an explicit builder

This allows an internal Builder created by SCons to be marked
non-explicit, so that it can be overridden by an explicit
builder that the user supplies (the canonical example being
directories).
```

is_derived(*self*)

```
Returns true iff this node is derived (i.e. built).

This should return true only for nodes whose path should be in
the variant directory when duplicate=0 and should contribute their build
signatures when they are used as source files to other derived files. For
example: source with source builders are not derived in this sense,
and hence should not return true.
```

is_literal(*self*)

```
Always pass the string representation of a Node to
the command interpreter literally.
```

is_under(*self*, *dir*)

is_up_to_date(*self*)

```
Default check for whether the Node is current: unknown Node
subtypes are always out of date, so they will always get built.
```

isdir(*self*)

isfile(*self*)

islink(*self*)

make_ready(*self*)

```
Get a Node ready for evaluation.

This is called before the Taskmaster decides if the Node is
up-to-date or not.  Overriding this method allows for a Node
subclass to be disambiguated if necessary, or for an implicit
source builder to be attached.
```

missing(*self*)

multiple_side_effect_has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

new_binfo(*self*)

postprocess(*self*)

```
Clean up anything we don't need to hang onto after we've
been built.
```

prepare(*self*)

```
Prepare for this Node to be built.

This is called after the Taskmaster has decided that the Node
is out-of-date and must be rebuilt, but before actually calling
the method to build the Node.

This default implementation checks that explicit or implicit
dependencies either exist or are derived, and initializes the
BuildInfo structure that will hold the information about how
this node is, uh, built.

(The existence of source files is checked separately by the
Executor, which aggregates checks for all of the targets built
by a specific action.)

Overriding this method allows for for a Node subclass to remove
the underlying file from the file system.  Note that subclass
methods should call this base class method to get the child
check and the BuildInfo structure.
```

push_to_cache(*self*)

```
Try to push a node into a cache
```

remove(*self*)

```
Remove this Node:  no-op by default.
```

render_include_tree(*self*)

```
Return a text representation, suitable for displaying to the
user, of the include tree for the sources of this node.
```

rentry(*self*)

reset_executor(*self*)

```
Remove cached executor; forces recompute when needed.
```

retrieve_from_cache(*self*)

```
Try to retrieve the node's content from a cache

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff in
built().

Returns true iff the node was successfully retrieved.
```

rexists(*self*)
Does this node exist locally or in a repositiory?

Overrides: SCons.Node.Node.rexists extit(inherited documentation)

rstr(*self*)

```
A Node.FS.Base object's string representation is its path
name.
```

scan(*self*)

```
Scan this node's dependents for implicit dependencies.
```

select_scanner(*self*, *scanner*)

```
Selects a scanner for this Node.

This is a separate method so it can be overridden by Node
subclasses (specifically, Node.FS.Dir) that *must* use their
own Scanner and don't select one the Scanner.Selector that's
configured for the target.
```

set_always_build(*self*, *always_build*=1)

```
Set the Node's always_build value.
```

set_executor(*self*, *executor*)

```
Set the action executor for this node.
```

set_explicit(*self*, *is_explicit*)

set_local(*self*)

set_nocache(*self*, *nocache*=1)

```
Set the Node's nocache value.
```

set_noclean(*self*, *noclean*=1)

```
Set the Node's noclean value.
```

set_precious(*self*, *precious*=1)

```
Set the Node's precious value.
```

set_specific_source(*self*, *source*)

set_src_builder(*self*, *builder*)

```
Set the source code builder for this node.
```

set_state(*self*, *state*)

src_builder(*self*)

```
Fetch the source code builder for this node.

If there isn't one, we cache the source code builder specified
for the directory (which in turn will cache the value from its
parent directory, and so on up to the file system root).
```

srcnode(*self*)

```
If this node is in a build path, return the node
corresponding to its source file.  Otherwise, return
ourself.
```

stat(*self*)

state_has_changed(*self*, *target*, *prev_ni*)

store_info(*self*)

```
Make the build signature permanent (that is, store it in the
.sconsign file or equivalent).
```

str_for_display(*self*)

target_from_source(*self*, *prefix*, *suffix*, *splitext*=<function splitext at 0x8415c34>)

```
Generates a target entry that corresponds to this entry (usually
a source file) with the specified prefix and suffix.

Note that this method can be overridden dynamically for generated
files that need different behavior.  See Tool/swig.py for
an example.
```

visited(*self*)

```
Called just after this node has been visited (with or
without a build).
```

15.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.7.3 Class Variables

Name	Description
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass
memoizer_counters	**Value:** []

15.8 Class LocalFS

object
└ **SCons.Node.FS.LocalFS**

Known Subclasses: SCons.Node.FS.FS

15.8.1 Methods

chmod(*self*, *path*, *mode*)

copy(*self*, *src*, *dst*)

copy2(*self*, *src*, *dst*)

exists(*self*, *path*)

getmtime(*self*, *path*)

getsize(*self*, *path*)

isdir(*self*, *path*)

isfile(*self*, *path*)

link(*self*, *src*, *dst*)

lstat(*self*, *path*)

listdir(*self*, *path*)

makedirs(*self*, *path*)

mkdir(*self*, *path*)

rename(*self*, *old*, *new*)

stat(*self*, *path*)

symlink(*self*, *src*, *dst*)

open(*self*, *path*)

unlink(*self*, *path*)

islink(*self*, *path*)

readlink(*self*, *file*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

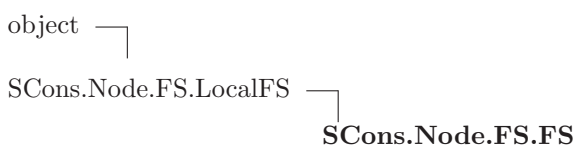
15.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.8.3 Class Variables

Name	Description
__metaclass__	**Value:** `SCons.Memoize.Memoized_Metaclass`

15.9 Class FS



15.9.1 Methods

__init__(*self*, *path*=`False`)

```
Initialize the Node.FS subsystem.

The supplied path is the top of the source tree, where we
expect to find the top-level build file.  If no path is
supplied, the current directory is the default.

The path argument must be a valid absolute path.
```

Overrides: object.__init__

set_SConstruct_dir(*self*, *dir*)

get_max_drift(*self*)

set_max_drift(*self*, *max_drift*)

getcwd(*self*)

chdir(*self*, *dir*, *change_os_dir*=`0`)

```
Change the current working directory for lookups.
If change_os_dir is true, we will also change the "real" cwd
to match.
```

get_root(*self*, *drive*)

```
Returns the root directory for the specified drive, creating
it if necessary.
```

Entry(*self*, *name*, *directory*=False, *create*=1)

```
Look up or create a generic Entry node with the specified name.
If the name is a relative path (begins with ./, ../, or a file
name), then it is looked up relative to the supplied directory
node, or to the top level directory of the FS (supplied at
construction time) if no directory is supplied.
```

File(*self*, *name*, *directory*=False, *create*=1)

```
Look up or create a File node with the specified name.  If
the name is a relative path (begins with ./, ../, or a file name),
then it is looked up relative to the supplied directory node,
or to the top level directory of the FS (supplied at construction
time) if no directory is supplied.

This method will raise TypeError if a directory is found at the
specified path.
```

Dir(*self*, *name*, *directory*=False, *create*=True)

```
Look up or create a Dir node with the specified name.  If
the name is a relative path (begins with ./, ../, or a file name),
then it is looked up relative to the supplied directory node,
or to the top level directory of the FS (supplied at construction
time) if no directory is supplied.

This method will raise TypeError if a normal file is found at the
specified path.
```

VariantDir(*self*, *variant_dir*, *src_dir*, *duplicate*=1)

```
Link the supplied variant directory to the source directory
for purposes of building files.
```

Repository(*self*, **dirs*)

```
Specify Repository directories to search.
```

variant_dir_target_climb(*self*, *orig*, *dir*, *tail*)

```
Create targets in corresponding variant directories

Climb the directory tree, and look up path names
relative to any linked variant directories we find.

Even though this loops and walks up the tree, we don't memoize
the return value because this is really only used to process
the command-line targets.
```

Glob(*self*, *pathname*, *ondisk*=True, *source*=True, *strings*=False, *cwd*=False)

```
Globs

This is mainly a shim layer
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

chmod(*self*, *path*, *mode*)

copy(*self*, *src*, *dst*)

copy2(*self*, *src*, *dst*)

exists(*self*, *path*)

getmtime(*self*, *path*)

getsize(*self*, *path*)

isdir(*self*, *path*)

isfile(*self*, *path*)

islink(*self*, *path*)

link(*self*, *src*, *dst*)

listdir(*self*, *path*)

lstat(*self*, *path*)

makedirs(*self*, *path*)

mkdir(*self*, *path*)

open(*self*, *path*)

readlink(*self*, *file*)

rename(*self*, *old*, *new*)

stat(*self*, *path*)

symlink(*self*, *src*, *dst*)

unlink(*self*, *path*)

15.9.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.9.3 Class Variables

Name	Description
memoizer_counters	**Value:** []
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass

15.10 Class DirNodeInfo

object
SCons.Node.NodeInfoBase
SCons.Node.FS.DirNodeInfo

```
The generic base class for signature information for a Node.

Node subclasses should subclass NodeInfoBase to provide their own
logic for dealing with their own Node-specific signature information.
```

15.10.1 Methods

str_to_node(*self*, *s*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *node*=False)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

convert(*self*, *node*, *val*)

format(*self*, *field_list*=`False`, *names*=`0`)

merge(*self*, *other*)

update(*self*, *node*)

15.10.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.10.3 Class Variables

Name	Description
current_version_id	**Value:** `1`
fs	**Value:** `False`

15.11 Class DirBuildInfo

object

SCons.Node.BuildInfoBase

SCons.Node.FS.DirBuildInfo

```
The generic base class for build information for a Node.

This is what gets stored in a .sconsign file for each target file.
It contains a NodeInfo instance for this node (signature information
that's specific to the type of Node) and direct attributes for the
generic build stuff we have to track:  sources, explicit dependencies,
implicit dependencies, and action information.
```

15.11.1 Methods

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *node*=False)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

merge(*self*, *other*)

15.11.2 Properties

continued on next page

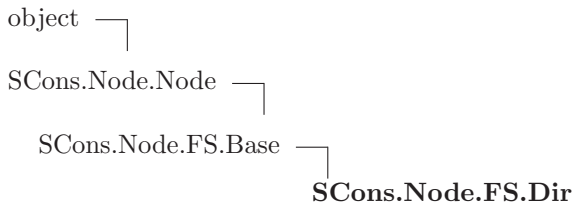
Name	Description

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.11.3 Class Variables

Name	Description
current_version_id	**Value:** 1

15.12 Class Dir



Known Subclasses: SCons.Node.FS.RootDir

```
A class for directories in a file system.
```

15.12.1 Methods

__init__(*self*, *name*, *directory*, *fs*)
```
Initialize a generic Node.FS.Base object.

Call the superclass initialization, take care of setting up
our relative and absolute paths, identify our parent
directory, and indicate that this node should use
signatures.
```
Overrides: SCons.Node.FS.Base.__init__ extit(inherited documentation)

diskcheck_match(*self*)

Entry(*self*, *name*)

```
Looks up or creates an entry node named 'name' relative to
this directory.
```

Dir(*self*, *name*, *create*=True)

```
Looks up or creates a directory node named 'name' relative to
this directory.
```

File(*self*, *name*)

```
Looks up or creates a file node named 'name' relative to
this directory.
```

link(*self*, *srcdir*, *duplicate*)

```
Set this directory as the variant directory for the
supplied source directory.
```

getRepositories(*self*)

```
Returns a list of repositories for this directory.
```

get_all_rdirs(*self*)

addRepository(*self*, *dir*)

up(*self*)

rel_path(*self*, *other*)

```
Return a path to "other" relative to this directory.
```

get_env_scanner(*self*, *env*, *kw*={})
Overrides: SCons.Node.Node.get_env_scanner

get_target_scanner(*self*)
Overrides: SCons.Node.Node.get_target_scanner

get_found_includes(*self*, *env*, *scanner*, *path*)

```
Return this directory's implicit dependencies.

We don't bother caching the results because the scan typically
shouldn't be requested more than once (as opposed to scanning
.h file contents, which can be requested as many times as the
files is #included by other files).
```

Overrides: SCons.Node.Node.get_found_includes

prepare(*self*)
```
Prepare for this Node to be built.

This is called after the Taskmaster has decided that the Node
is out-of-date and must be rebuilt, but before actually calling
the method to build the Node.

This default implementation checks that explicit or implicit
dependencies either exist or are derived, and initializes the
BuildInfo structure that will hold the information about how
this node is, uh, built.

(The existence of source files is checked separately by the
Executor, which aggregates checks for all of the targets built
by a specific action.)

Overriding this method allows for for a Node subclass to remove
the underlying file from the file system.  Note that subclass
methods should call this base class method to get the child
check and the BuildInfo structure.
```
Overrides: SCons.Node.Node.prepare extit(inherited documentation)

build(*self*, ***kw*)

```
A null "builder" for directories.
```
Overrides: SCons.Node.Node.build

multiple_side_effect_has_builder(*self*)
```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```
Overrides: SCons.Node.Node.multiple_side_effect_has_builder extit(inherited documentation)

alter_targets(*self*)

```
Return any corresponding targets in a variant directory.
```
Overrides: SCons.Node.Node.alter_targets

scanner_key(*self*)

```
A directory does not get scanned.
```
Overrides: SCons.Node.Node.scanner_key

get_text_contents(*self*)

```
We already emit things in text, so just return the binary
version.
```

get_contents(*self*)

```
Return content signatures and names of all our children
separated by new-lines. Ensure that the nodes are sorted.
```

get_csig(*self*)

```
Compute the content signature for Directory nodes. In
general, this is not needed and the content signature is not
stored in the DirNodeInfo. However, if get_contents on a Dir
node is called which has a child directory, the child
directory should return the hash of its contents.
```

Overrides: SCons.Node.Node.get_csig

do_duplicate(*self*, *src*)

changed_since_last_build(*self*, *target*, *prev_ni*)

```
Must be overridden in a specific subclass to return True if this
Node (a dependency) has changed since the last time it was used
to build the specified target.  prev_ni is this Node's state (for
example, its file timestamp, length, maybe content signature)
as of the last time the target was built.

Note that this method is called through the dependency, not the
target, because a dependency Node must be able to use its own
logic to decide if it changed.  For example, File Nodes need to
obey if we're configured to use timestamps, but Python Value Nodes
never use timestamps and always use the content.  If this method
were called through the target, then each Node's implementation
of this method would have to have more complicated logic to
handle all the different Node types on which it might depend.
```

Overrides: SCons.Node.Node.changed_since_last_build extit(inherited documentation)

is_up_to_date(*self*)

```
If any child is not up-to-date, then this directory isn't,
either.
```

Overrides: SCons.Node.Node.is_up_to_date

rdir(*self*)

sconsign(*self*)

```
Return the .sconsign file info for this directory,
creating it first if necessary.
```

srcnode(*self*)

```
Dir has a special need for srcnode()...if we
have a srcdir attribute set, then that *is* our srcnode.
```

Overrides: SCons.Node.FS.Base.srcnode

get_timestamp(*self*)

```
Return the latest timestamp from among our children
```

entry_abspath(*self*, *name*)

entry_labspath(*self*, *name*)

entry_path(*self*, *name*)

entry_tpath(*self*, *name*)

entry_exists_on_disk(*self*, *name*)

srcdir_list(*self*)

srcdir_duplicate(*self*, *name*)

srcdir_find_file(*self*, *filename*)

dir_on_disk(*self*, *name*)

file_on_disk(*self*, *name*)

walk(*self*, *func*, *arg*)

```
Walk this directory tree by calling the specified function
for each directory in the tree.

This behaves like the os.path.walk() function, but for in-memory
Node.FS.Dir objects.  The function takes the same arguments as
the functions passed to os.path.walk():

        func(arg, dirname, fnames)

Except that "dirname" will actually be the directory *Node*,
not the string.  The '.' and '..' entries are excluded from
fnames.  The fnames list may be modified in-place to filter the
subdirectories visited or otherwise impose a specific order.
The "arg" argument is always passed to func() and may be used
in any way (or ignored, passing None is common).
```

glob(*self*, *pathname*, *ondisk*=True, *source*=False, *strings*=False)

```
Returns a list of Nodes (or strings) matching a specified
pathname pattern.

Pathname patterns follow UNIX shell semantics:  * matches
any-length strings of any characters, ? matches any character,
and [] can enclose lists or ranges of characters.  Matches do
not span directory separators.

The matches take into account Repositories, returning local
Nodes if a corresponding entry exists in a Repository (either
an in-memory Node or something on disk).

By defafult, the glob() function matches entries that exist
on-disk, in addition to in-memory Nodes.  Setting the "ondisk"
argument to False (or some other non-true value) causes the glob()
function to only match in-memory Nodes.  The default behavior is
to return both the on-disk and in-memory Nodes.

The "source" argument, when true, specifies that corresponding
source Nodes must be returned if you're globbing in a build
directory (initialized with VariantDir()).  The default behavior
is to return Nodes local to the VariantDir().

The "strings" argument, when true, returns the matches as strings,
not Nodes.  The strings are path names relative to this directory.

The underlying algorithm is adapted from the glob.glob() function
in the Python library (but heavily modified), and uses fnmatch()
under the covers.
```

Decider(*self*, *function*)

RDirs(*self*, *pathlist*)

```
Search for a list of directories in the Repository list.
```

Rfindalldirs(*self*, *pathlist*)

```
Return all of the directories for a given path list, including
corresponding "backing" directories in any repositories.

The Node lookups are relative to this Node (typically a
directory), so memoizing result saves cycles from looking
up the same path for each target in a given directory.
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*self*)

A Node.FS.Base object's string representation is its path name.

Overrides: object.__str__

add_dependency(*self*, *depend*)

Adds dependencies.

add_ignore(*self*, *depend*)

Adds dependencies to ignore.

add_prerequisite(*self*, *prerequisite*)

Adds prerequisites

add_source(*self*, *source*)

Adds sources.

add_to_implicit(*self*, *deps*)

add_to_waiting_parents(*self*, *node*)

Returns the number of nodes added to our waiting parents list: 1 if we add a unique waiting parent, 0 if not. (Note that the returned values are intended to be used to increment a reference count, so don't think you can "clean up" this function by using True and False instead...)

add_to_waiting_s_e(*self*, *node*)

add_wkid(*self*, *wkid*)

Add a node to the list of kids waiting to be evaluated

all_children(*self*, *scan*=1)

Return a list of all the node's direct children.

builder_set(*self*, *builder*)

built(*self*)

Called just after this node is successfully built.

changed(*self*, *node*=False)

```
Returns if the node is up-to-date with respect to the BuildInfo
stored last time it was built.  The default behavior is to compare
it against our own previously stored BuildInfo, but the stored
BuildInfo from another Node (typically one in a Repository)
can be used instead.

Note that we now *always* check every dependency.  We used to
short-circuit the check by returning as soon as we detected
any difference, but we now rely on checking every dependency
to make sure that any necessary Node information (for example,
the content signature of an #included .h file) is updated.
```

children(*self*, *scan*=1)

```
Return a list of the node's direct children, minus those
that are ignored by this node.
```

children_are_up_to_date(*self*)

```
Alternate check for whether the Node is current:  If all of
our children were up-to-date, then this Node was up-to-date, too.

The SCons.Node.Alias and SCons.Node.Python.Value subclasses
rebind their current() method to this method.
```

clear(*self*)

```
Completely clear a Node of all its cached state (so that it
can be re-evaluated by interfaces that do continuous integration
builds).
```

clear_memoized_values(*self*)

del_binfo(*self*)

```
Delete the build info from this node.
```

disambiguate(*self*, *must_exist*=False)

do_not_store_info(*self*)

env_set(*self*, *env*, *safe*=0)

executor_cleanup(*self*)

```
Let the executor clean up any cached information.
```

exists(*self*)
Does this node exists?

Overrides: SCons.Node.Node.exists extit(inherited documentation)

explain(*self*)

for_signature(*self*)

Return a string representation of the Node that will always
be the same for this particular Node, no matter what. This
is by contrast to the __str__() method, which might, for
instance, return a relative path for a file Node. The purpose
of this method is to generate a value to be used in signature
calculation for the command line used to build a target, and
we use this method instead of str() to avoid unnecessary
rebuilds. This method does not need to return something that
would actually work in a command line; it can return any kind of
nonsense, so long as it does not change.

Overrides: SCons.Node.Node.for_signature extit(inherited documentation)

get_abspath(*self*)

Get the absolute path of the file.

Overrides: SCons.Node.Node.get_abspath

get_binfo(*self*)

Fetch a node's build information.

node - the node whose sources will be collected
cache - alternate node to use for the signature cache
returns - the build signature

This no longer handles the recursive descent of the
node's children's signatures. We expect that they're
already built and updated by someone else, if that's
what's wanted.

get_build_env(*self*)

Fetch the appropriate Environment to build this node.

get_build_scanner_path(*self*, *scanner*)

Fetch the appropriate scanner path for this node.

get_builder(*self*, *default_builder*=False)

```
Return the set builder, or a specified default value
```

get_cachedir_csig(*self*)

get_dir(*self*)

get_env(*self*)

get_executor(*self*, *create*=1)

```
Fetch the action executor for this node.  Create one if
there isn't already one, and requested to do so.
```

get_implicit_deps(*self*, *env*, *scanner*, *path*)

```
Return a list of implicit dependencies for this node.

This method exists to handle recursive invocation of the scanner
on the implicit dependencies returned by the scanner, if the
scanner's recursive flag says that we should.
```

get_ninfo(*self*)

get_path(*self*, *dir*=False)

```
Return path relative to the current working directory of the
Node.FS.Base object that owns us.
```

get_source_scanner(*self*, *node*)

```
Fetch the source scanner for the specified node

NOTE:  "self" is the target being built, "node" is
the source file for which we want to fetch the scanner.

Implies self.has_builder() is true; again, expect to only be
called from locations where this is already verified.

This function may be called very often; it attempts to cache
the scanner found to improve performance.
```

get_state(*self*)

get_stored_implicit(*self*)

```
Fetch the stored implicit dependencies
```

get_stored_info(*self*)

get_string(*self*, *for_signature*)

```
This is a convenience function designed primarily to be
used in command generators (i.e., CommandGeneratorActions or
Environment variables that are callable), which are called
with a for_signature argument that is nonzero if the command
generator is being called to generate a signature for the
command line, which determines if we should rebuild or not.

Such command generators should use this method in preference
to str(Node) when converting a Node to a string, passing
in the for_signature parameter, such that we will call
Node.for_signature() or str(Node) properly, depending on whether
we are calculating a signature or actually constructing a
command line.
```

get_subst_proxy(*self*)

```
This method is expected to return an object that will function
exactly like this Node, except that it implements any additional
special features that we would like to be in effect for
Environment variable substitution.  The principle use is that
some Nodes would like to implement a __getattr__() method,
but putting that in the Node type itself has a tendency to kill
performance.  We instead put it in a proxy and return it from
this method.  It is legal for this method to return self
if no new functionality is needed for Environment substitution.
```

Overrides: SCons.Node.Node.get_subst_proxy extit(inherited documentation)

get_suffix(*self*)
Overrides: SCons.Node.Node.get_suffix

getmtime(*self*)

getsize(*self*)

has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

has_explicit_builder(*self*)

```
Return whether this Node has an explicit builder

This allows an internal Builder created by SCons to be marked
non-explicit, so that it can be overridden by an explicit
builder that the user supplies (the canonical example being
directories).
```

is_derived(*self*)

```
Returns true iff this node is derived (i.e. built).

This should return true only for nodes whose path should be in
the variant directory when duplicate=0 and should contribute their build
signatures when they are used as source files to other derived files. For
example: source with source builders are not derived in this sense,
and hence should not return true.
```

is_literal(*self*)

```
Always pass the string representation of a Node to
the command interpreter literally.
```

is_under(*self*, *dir*)

isdir(*self*)

isfile(*self*)

islink(*self*)

make_ready(*self*)

```
Get a Node ready for evaluation.

This is called before the Taskmaster decides if the Node is
up-to-date or not.  Overriding this method allows for a Node
subclass to be disambiguated if necessary, or for an implicit
source builder to be attached.
```

missing(*self*)

must_be_same(*self*, *klass*)

```
This node, which already existed, is being looked up as the
specified klass.  Raise an exception if it isn't.
```

new_binfo(*self*)

new_ninfo(*self*)

postprocess(*self*)

```
Clean up anything we don't need to hang onto after we've
been built.
```

push_to_cache(*self*)

```
Try to push a node into a cache
```

remove(*self*)

```
Remove this Node:  no-op by default.
```

render_include_tree(*self*)

```
Return a text representation, suitable for displaying to the
user, of the include tree for the sources of this node.
```

rentry(*self*)

reset_executor(*self*)

```
Remove cached executor; forces recompute when needed.
```

retrieve_from_cache(*self*)

```
Try to retrieve the node's content from a cache

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff in
built().

Returns true iff the node was successfully retrieved.
```

rexists(*self*)
Does this node exist locally or in a repositiory?

Overrides: SCons.Node.Node.rexists extit(inherited documentation)

rfile(*self*)

rstr(*self*)

```
A Node.FS.Base object's string representation is its path
name.
```

scan(*self*)

```
Scan this node's dependents for implicit dependencies.
```

select_scanner(*self*, *scanner*)

```
Selects a scanner for this Node.

This is a separate method so it can be overridden by Node
subclasses (specifically, Node.FS.Dir) that *must* use their
own Scanner and don't select one the Scanner.Selector that's
configured for the target.
```

set_always_build(*self*, *always_build*=1)

```
Set the Node's always_build value.
```

set_executor(*self*, *executor*)

```
Set the action executor for this node.
```

set_explicit(*self*, *is_explicit*)

set_local(*self*)

set_nocache(*self*, *nocache*=1)

```
Set the Node's nocache value.
```

set_noclean(*self*, *noclean*=1)

```
Set the Node's noclean value.
```

set_precious(*self*, *precious*=1)

```
Set the Node's precious value.
```

set_specific_source(*self*, *source*)

set_src_builder(*self*, *builder*)

```
Set the source code builder for this node.
```

set_state(*self*, *state*)

src_builder(*self*)

```
Fetch the source code builder for this node.

If there isn't one, we cache the source code builder specified
for the directory (which in turn will cache the value from its
parent directory, and so on up to the file system root).
```

stat(*self*)

state_has_changed(*self*, *target*, *prev_ni*)

store_info(*self*)

```
Make the build signature permanent (that is, store it in the
.sconsign file or equivalent).
```

str_for_display(*self*)

target_from_source(*self*, *prefix*, *suffix*, *splitext*=<function splitext at 0x8415c34>)

```
Generates a target entry that corresponds to this entry (usually
a source file) with the specified prefix and suffix.

Note that this method can be overridden dynamically for generated
files that need different behavior.  See Tool/swig.py for
an example.
```

visited(*self*)

```
Called just after this node has been visited (with or
without a build).
```

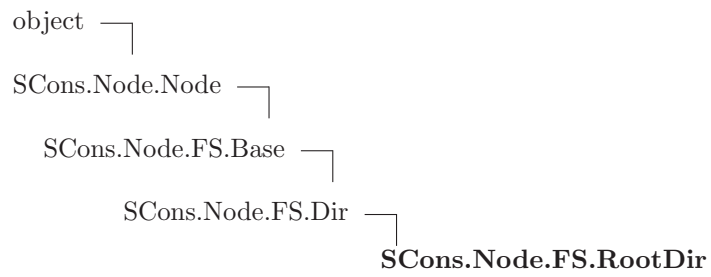
15.12.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.12.3 Class Variables

Name	Description
memoizer_counters	**Value:** []
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass

15.13 Class RootDir




```
A class for the root directory of a file system.

This is the same as a Dir class, except that the path separator
('/' or '\') is actually part of the name, so we don't need to
add a separator when creating the path names of entries within
this directory.
```

15.13.1 Methods

__init__(*self*, *name*, *fs*)
```
Initialize a generic Node.FS.Base object.

Call the superclass initialization, take care of setting up
our relative and absolute paths, identify our parent
directory, and indicate that this node should use
signatures.
```
Overrides: SCons.Node.FS.Dir.__init__

must_be_same(*self*, *klass*)

```
This node, which already existed, is being looked up as the
specified klass.  Raise an exception if it isn't.
```
Overrides: SCons.Node.FS.Base.must_be_same extit(inherited documentation)

__str__(*self*)
```
A Node.FS.Base object's string representation is its path
name.
```
Overrides: SCons.Node.FS.Base.__str__ extit(inherited documentation)

entry_abspath(*self*, *name*)
Overrides: SCons.Node.FS.Dir.entry_abspath

entry_labspath(*self*, *name*)
Overrides: SCons.Node.FS.Dir.entry_labspath

entry_path(*self*, *name*)
Overrides: SCons.Node.FS.Dir.entry_path

entry_tpath(*self*, *name*)
Overrides: SCons.Node.FS.Dir.entry_tpath

is_under(*self*, *dir*)
Overrides: SCons.Node.FS.Base.is_under

up(*self*)
Overrides: SCons.Node.FS.Dir.up

get_dir(*self*)
Overrides: SCons.Node.FS.Base.get_dir

src_builder(*self*)
```
Fetch the source code builder for this node.

If there isn't one, we cache the source code builder specified
for the directory (which in turn will cache the value from its
parent directory, and so on up to the file system root).
```
Overrides: SCons.Node.FS.Base.src_builder extit(inherited documentation)

Decider(*self*, *function*)

Dir(*self*, *name*, *create*=`True`)

```
Looks up or creates a directory node named 'name' relative to
this directory.
```

Entry(*self*, *name*)

```
Looks up or creates an entry node named 'name' relative to
this directory.
```

File(*self*, *name*)

```
Looks up or creates a file node named 'name' relative to
this directory.
```

RDirs(*self*, *pathlist*)

```
Search for a list of directories in the Repository list.
```

Rfindalldirs(*self*, *pathlist*)

```
Return all of the directories for a given path list, including
corresponding "backing" directories in any repositories.

The Node lookups are relative to this Node (typically a
directory), so memoizing result saves cycles from looking
up the same path for each target in a given directory.
```

__**delattr**__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__**getattribute**__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__**hash**__(*x*)

```
hash(x)
```

__**new**__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__**reduce**__(*...*)

```
helper for pickle
```

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

addRepository(*self*, *dir*)

add_dependency(*self*, *depend*)

```
Adds dependencies.
```

add_ignore(*self*, *depend*)

```
Adds dependencies to ignore.
```

add_prerequisite(*self*, *prerequisite*)

```
Adds prerequisites
```

add_source(*self*, *source*)

```
Adds sources.
```

add_to_implicit(*self*, *deps*)

add_to_waiting_parents(*self*, *node*)

```
Returns the number of nodes added to our waiting parents list:
1 if we add a unique waiting parent, 0 if not.  (Note that the
returned values are intended to be used to increment a reference
count, so don't think you can "clean up" this function by using
True and False instead...)
```

add_to_waiting_s_e(*self*, *node*)

add_wkid(*self*, *wkid*)

```
Add a node to the list of kids waiting to be evaluated
```

all_children(*self*, *scan*=1)

```
Return a list of all the node's direct children.
```

alter_targets(*self*)

```
Return any corresponding targets in a variant directory.
```

Overrides: SCons.Node.Node.alter_targets

build(*self*, ***kw*)

```
A null "builder" for directories.
```

Overrides: SCons.Node.Node.build

builder_set(*self*, *builder*)

built(*self*)

```
Called just after this node is successfully built.
```

changed(*self*, *node*=False)

```
Returns if the node is up-to-date with respect to the BuildInfo
stored last time it was built.  The default behavior is to compare
it against our own previously stored BuildInfo, but the stored
BuildInfo from another Node (typically one in a Repository)
can be used instead.

Note that we now *always* check every dependency.  We used to
short-circuit the check by returning as soon as we detected
any difference, but we now rely on checking every dependency
to make sure that any necessary Node information (for example,
the content signature of an #included .h file) is updated.
```

changed_since_last_build(*self*, *target*, *prev_ni*)

```
Must be overridden in a specific subclass to return True if this
Node (a dependency) has changed since the last time it was used
to build the specified target.  prev_ni is this Node's state (for
example, its file timestamp, length, maybe content signature)
as of the last time the target was built.

Note that this method is called through the dependency, not the
target, because a dependency Node must be able to use its own
logic to decide if it changed.  For example, File Nodes need to
obey if we're configured to use timestamps, but Python Value Nodes
never use timestamps and always use the content.  If this method
were called through the target, then each Node's implementation
of this method would have to have more complicated logic to
handle all the different Node types on which it might depend.
```

Overrides: SCons.Node.Node.changed_since_last_build extit(inherited documentation)

children(*self*, *scan*=1)

```
Return a list of the node's direct children, minus those
that are ignored by this node.
```

children_are_up_to_date(*self*)

```
Alternate check for whether the Node is current:  If all of
our children were up-to-date, then this Node was up-to-date, too.

The SCons.Node.Alias and SCons.Node.Python.Value subclasses
rebind their current() method to this method.
```

clear(*self*)

```
Completely clear a Node of all its cached state (so that it
can be re-evaluated by interfaces that do continuous integration
builds).
```

clear_memoized_values(*self*)

del_binfo(*self*)

```
Delete the build info from this node.
```

dir_on_disk(*self*, *name*)

disambiguate(*self*, *must_exist*=`False`)

diskcheck_match(*self*)

do_duplicate(*self*, *src*)

do_not_store_info(*self*)

entry_exists_on_disk(*self*, *name*)

env_set(*self*, *env*, *safe*=`0`)

executor_cleanup(*self*)

```
Let the executor clean up any cached information.
```

exists(*self*)
`Does this node exists?`

Overrides: SCons.Node.Node.exists extit(inherited documentation)

explain(*self*)

file_on_disk(*self*, *name*)

for_signature(*self*)

```
Return a string representation of the Node that will always
be the same for this particular Node, no matter what.  This
is by contrast to the __str__() method, which might, for
instance, return a relative path for a file Node.  The purpose
of this method is to generate a value to be used in signature
calculation for the command line used to build a target, and
we use this method instead of str() to avoid unnecessary
rebuilds.  This method does not need to return something that
would actually work in a command line; it can return any kind of
nonsense, so long as it does not change.
```

Overrides: SCons.Node.Node.for_signature extit(inherited documentation)

getRepositories(*self*)

```
Returns a list of repositories for this directory.
```

get_abspath(*self*)

```
Get the absolute path of the file.
```

Overrides: SCons.Node.Node.get_abspath

get_all_rdirs(*self*)

get_binfo(*self*)

```
Fetch a node's build information.

node - the node whose sources will be collected
cache - alternate node to use for the signature cache
returns - the build signature

This no longer handles the recursive descent of the
node's children's signatures.  We expect that they're
already built and updated by someone else, if that's
what's wanted.
```

get_build_env(*self*)

```
Fetch the appropriate Environment to build this node.
```

get_build_scanner_path(*self*, *scanner*)

```
Fetch the appropriate scanner path for this node.
```

get_builder(*self*, *default_builder*=`False`)

```
Return the set builder, or a specified default value
```

get_cachedir_csig(*self*)

get_contents(*self*)

```
Return content signatures and names of all our children
separated by new-lines. Ensure that the nodes are sorted.
```

get_csig(*self*)

```
Compute the content signature for Directory nodes. In
general, this is not needed and the content signature is not
stored in the DirNodeInfo. However, if get_contents on a Dir
node is called which has a child directory, the child
directory should return the hash of its contents.
```

Overrides: SCons.Node.Node.get_csig

get_env(*self*)

get_env_scanner(*self*, *env*, *kw*={})
Overrides: SCons.Node.Node.get_env_scanner

get_executor(*self*, *create*=1)

```
Fetch the action executor for this node.  Create one if
there isn't already one, and requested to do so.
```

get_found_includes(*self*, *env*, *scanner*, *path*)

```
Return this directory's implicit dependencies.

We don't bother caching the results because the scan typically
shouldn't be requested more than once (as opposed to scanning
.h file contents, which can be requested as many times as the
files is #included by other files).
```

Overrides: SCons.Node.Node.get_found_includes

get_implicit_deps(*self*, *env*, *scanner*, *path*)

```
Return a list of implicit dependencies for this node.

This method exists to handle recursive invocation of the scanner
on the implicit dependencies returned by the scanner, if the
scanner's recursive flag says that we should.
```

get_ninfo(*self*)

get_path(*self*, *dir*=False)

```
Return path relative to the current working directory of the
Node.FS.Base object that owns us.
```

get_source_scanner(*self*, *node*)

```
Fetch the source scanner for the specified node

NOTE:  "self" is the target being built, "node" is
the source file for which we want to fetch the scanner.

Implies self.has_builder() is true; again, expect to only be
called from locations where this is already verified.

This function may be called very often; it attempts to cache
the scanner found to improve performance.
```

get_state(*self*)

get_stored_implicit(*self*)

```
Fetch the stored implicit dependencies
```

get_stored_info(*self*)

get_string(*self*, *for_signature*)

```
This is a convenience function designed primarily to be
used in command generators (i.e., CommandGeneratorActions or
Environment variables that are callable), which are called
with a for_signature argument that is nonzero if the command
generator is being called to generate a signature for the
command line, which determines if we should rebuild or not.

Such command generators should use this method in preference
to str(Node) when converting a Node to a string, passing
in the for_signature parameter, such that we will call
Node.for_signature() or str(Node) properly, depending on whether
we are calculating a signature or actually constructing a
command line.
```

get_subst_proxy(*self*)

```
This method is expected to return an object that will function
exactly like this Node, except that it implements any additional
special features that we would like to be in effect for
Environment variable substitution.  The principle use is that
some Nodes would like to implement a __getattr__() method,
but putting that in the Node type itself has a tendency to kill
performance.  We instead put it in a proxy and return it from
this method.  It is legal for this method to return self
if no new functionality is needed for Environment substitution.
```

Overrides: SCons.Node.Node.get_subst_proxy extit(inherited documentation)

get_suffix(*self*)
Overrides: SCons.Node.Node.get_suffix

get_target_scanner(*self*)
Overrides: SCons.Node.Node.get_target_scanner

get_text_contents(*self*)

```
We already emit things in text, so just return the binary
version.
```

get_timestamp(*self*)

```
Return the latest timestamp from among our children
```

getmtime(*self*)

getsize(*self*)

glob(*self*, *pathname*, *ondisk*=True, *source*=False, *strings*=False)

```
Returns a list of Nodes (or strings) matching a specified
pathname pattern.

Pathname patterns follow UNIX shell semantics:  * matches
any-length strings of any characters, ? matches any character,
and [] can enclose lists or ranges of characters.  Matches do
not span directory separators.

The matches take into account Repositories, returning local
Nodes if a corresponding entry exists in a Repository (either
an in-memory Node or something on disk).

By defafult, the glob() function matches entries that exist
on-disk, in addition to in-memory Nodes.  Setting the "ondisk"
argument to False (or some other non-true value) causes the glob()
function to only match in-memory Nodes.  The default behavior is
to return both the on-disk and in-memory Nodes.

The "source" argument, when true, specifies that corresponding
source Nodes must be returned if you're globbing in a build
directory (initialized with VariantDir()).  The default behavior
is to return Nodes local to the VariantDir().

The "strings" argument, when true, returns the matches as strings,
not Nodes.  The strings are path names relative to this directory.

The underlying algorithm is adapted from the glob.glob() function
in the Python library (but heavily modified), and uses fnmatch()
under the covers.
```

has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

has_explicit_builder(*self*)

```
Return whether this Node has an explicit builder

This allows an internal Builder created by SCons to be marked
non-explicit, so that it can be overridden by an explicit
builder that the user supplies (the canonical example being
directories).
```

is_derived(*self*)

```
Returns true iff this node is derived (i.e. built).

This should return true only for nodes whose path should be in
the variant directory when duplicate=0 and should contribute their build
signatures when they are used as source files to other derived files. For
example: source with source builders are not derived in this sense,
and hence should not return true.
```

is_literal(*self*)

```
Always pass the string representation of a Node to
the command interpreter literally.
```

is_up_to_date(*self*)

```
If any child is not up-to-date, then this directory isn't,
either.
```

Overrides: SCons.Node.Node.is_up_to_date

isdir(*self*)

isfile(*self*)

islink(*self*)

link(*self*, *srcdir*, *duplicate*)

```
Set this directory as the variant directory for the
supplied source directory.
```

make_ready(*self*)

```
Get a Node ready for evaluation.

This is called before the Taskmaster decides if the Node is
up-to-date or not.  Overriding this method allows for a Node
subclass to be disambiguated if necessary, or for an implicit
source builder to be attached.
```

missing(*self*)

multiple_side_effect_has_builder(*self*)
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.

Overrides: SCons.Node.Node.multiple_side_effect_has_builder extit(inherited documentation)

new_binfo(*self*)

new_ninfo(*self*)

postprocess(*self*)

Clean up anything we don't need to hang onto after we've
been built.

prepare(*self*)
Prepare for this Node to be built.

This is called after the Taskmaster has decided that the Node
is out-of-date and must be rebuilt, but before actually calling
the method to build the Node.

This default implementation checks that explicit or implicit
dependencies either exist or are derived, and initializes the
BuildInfo structure that will hold the information about how
this node is, uh, built.

(The existence of source files is checked separately by the
Executor, which aggregates checks for all of the targets built
by a specific action.)

Overriding this method allows for for a Node subclass to remove
the underlying file from the file system. Note that subclass
methods should call this base class method to get the child
check and the BuildInfo structure.

Overrides: SCons.Node.Node.prepare extit(inherited documentation)

push_to_cache(*self*)

Try to push a node into a cache

rdir(*self*)

rel_path(*self*, *other*)

```
Return a path to "other" relative to this directory.
```

remove(*self*)

```
Remove this Node:  no-op by default.
```

render_include_tree(*self*)

```
Return a text representation, suitable for displaying to the
user, of the include tree for the sources of this node.
```

rentry(*self*)

reset_executor(*self*)

```
Remove cached executor; forces recompute when needed.
```

retrieve_from_cache(*self*)

```
Try to retrieve the node's content from a cache

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff in
built().

Returns true iff the node was successfully retrieved.
```

rexists(*self*)
Does this node exist locally or in a repositiory?

Overrides: SCons.Node.Node.rexists extit(inherited documentation)

rfile(*self*)

rstr(*self*)

```
A Node.FS.Base object's string representation is its path
name.
```

scan(*self*)

```
Scan this node's dependents for implicit dependencies.
```

scanner_key(*self*)

```
A directory does not get scanned.
```

Overrides: SCons.Node.Node.scanner_key

sconsign(*self*)

```
Return the .sconsign file info for this directory,
creating it first if necessary.
```

select_scanner(*self*, *scanner*)

```
Selects a scanner for this Node.

This is a separate method so it can be overridden by Node
subclasses (specifically, Node.FS.Dir) that *must* use their
own Scanner and don't select one the Scanner.Selector that's
configured for the target.
```

set_always_build(*self*, *always_build*=1)

```
Set the Node's always_build value.
```

set_executor(*self*, *executor*)

```
Set the action executor for this node.
```

set_explicit(*self*, *is_explicit*)

set_local(*self*)

set_nocache(*self*, *nocache*=1)

```
Set the Node's nocache value.
```

set_noclean(*self*, *noclean*=1)

```
Set the Node's noclean value.
```

set_precious(*self*, *precious*=1)

```
Set the Node's precious value.
```

set_specific_source(*self*, *source*)

set_src_builder(*self*, *builder*)

```
Set the source code builder for this node.
```

set_state(*self*, *state*)

srcdir_duplicate(*self*, *name*)

srcdir_find_file(*self*, *filename*)

srcdir_list(*self*)

srcnode(*self*)

```
Dir has a special need for srcnode()...if we
have a srcdir attribute set, then that *is* our srcnode.
```

Overrides: SCons.Node.FS.Base.srcnode

stat(*self*)

state_has_changed(*self*, *target*, *prev_ni*)

store_info(*self*)

```
Make the build signature permanent (that is, store it in the
.sconsign file or equivalent).
```

str_for_display(*self*)

target_from_source(*self*, *prefix*, *suffix*, *splitext*=<function splitext at 0x8415c34>)

```
Generates a target entry that corresponds to this entry (usually
a source file) with the specified prefix and suffix.

Note that this method can be overridden dynamically for generated
files that need different behavior.  See Tool/swig.py for
an example.
```

visited(*self*)

```
Called just after this node has been visited (with or
without a build).
```

walk(*self*, *func*, *arg*)

```
Walk this directory tree by calling the specified function
for each directory in the tree.

This behaves like the os.path.walk() function, but for in-memory
Node.FS.Dir objects.  The function takes the same arguments as
the functions passed to os.path.walk():

        func(arg, dirname, fnames)

Except that "dirname" will actually be the directory *Node*,
not the string.  The '.' and '..' entries are excluded from
fnames.  The fnames list may be modified in-place to filter the
subdirectories visited or otherwise impose a specific order.
The "arg" argument is always passed to func() and may be used
in any way (or ignored, passing None is common).
```

15.13.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.13.3 Class Variables

Name	Description
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass
memoizer_counters	**Value:** []

15.14 Class FileNodeInfo

object

SCons.Node.NodeInfoBase

SCons.Node.FS.FileNodeInfo

```
The generic base class for signature information for a Node.

Node subclasses should subclass NodeInfoBase to provide their own
logic for dealing with their own Node-specific signature information.
```

15.14.1 Methods

str_to_node(*self*, *s*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *node*=`False`)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

convert(*self*, *node*, *val*)

format(*self*, *field_list*=`False`, *names*=`0`)

merge(*self*, *other*)

update(*self*, *node*)

15.14.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.14.3 Class Variables

Name	Description
current_version_id	**Value:** 1
field_list	**Value:** ['csig', 'timestamp', 'size']
fs	**Value:** False

15.15 Class FileBuildInfo

object

SCons.Node.BuildInfoBase

SCons.Node.FS.FileBuildInfo

Known Subclasses: SCons.SConf.SConfBuildInfo

```
The generic base class for build information for a Node.

This is what gets stored in a .sconsign file for each target file.
It contains a NodeInfo instance for this node (signature information
that's specific to the type of Node) and direct attributes for the
generic build stuff we have to track:  sources, explicit dependencies,
implicit dependencies, and action information.
```

15.15.1 Methods

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *node*=False)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

convert_from_sconsign(*self*, *dir*, *name*)

```
Converts a newly-read FileBuildInfo object for in-SCons use

For normal up-to-date checking, we don't have any conversion to
perform--but we're leaving this method here to make that clear.
```

convert_to_sconsign(*self*)

```
Converts this FileBuildInfo object for writing to a .sconsign file

This replaces each Node in our various dependency lists with its
usual string representation: relative to the top-level SConstruct
directory, or an absolute path if it's outside.
```

format(*self*, *names*=0)

merge(*self*, *other*)

prepare_dependencies(*self*)

```
Prepares a FileBuildInfo object for explaining what changed

The bsources, bdepends and bimplicit lists have all been
stored on disk as paths relative to the top-level SConstruct
directory.  Convert the strings to actual Nodes (for use by the
--debug=explain code and --implicit-cache).
```

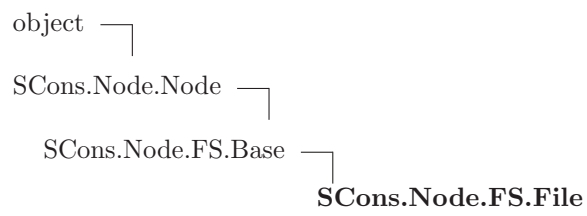
15.15.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.15.3 Class Variables

Name	Description
current_version_id	**Value:** 1

15.16 Class File




```
A class for files in a file system.
```

15.16.1 Methods

diskcheck_match(*self*)

__**init**__(*self*, *name*, *directory*, *fs*)

```
Initialize a generic Node.FS.Base object.

Call the superclass initialization, take care of setting up
our relative and absolute paths, identify our parent
directory, and indicate that this node should use
signatures.
```

Overrides: SCons.Node.FS.Base.__init__ extit(inherited documentation)

Entry(*self*, *name*)

```
Create an entry node named 'name' relative to
the directory of this file.
```

Dir(*self*, *name*, *create*=True)

```
Create a directory node named 'name' relative to
the directory of this file.
```

Dirs(*self*, *pathlist*)

```
Create a list of directories relative to the SConscript
directory of this file.
```

File(*self*, *name*)

```
Create a file node named 'name' relative to
the directory of this file.
```

scanner_key(*self*)
Overrides: SCons.Node.Node.scanner_key

get_contents(*self*)

get_text_contents(*self*)

get_content_hash(*self*)

```
Compute and return the MD5 hash for this file.
```

get_size(*self*)

get_timestamp(*self*)

store_info(*self*)
```
Make the build signature permanent (that is, store it in the
.sconsign file or equivalent).
```
Overrides: SCons.Node.Node.store_info extit(inherited documentation)

convert_old_entry(*self*, *old_entry*)

get_stored_info(*self*)
Overrides: SCons.Node.Node.get_stored_info

get_stored_implicit(*self*)
```
Fetch the stored implicit dependencies
```
Overrides: SCons.Node.Node.get_stored_implicit extit(inherited documentation)

rel_path(*self*, *other*)

get_found_includes(*self*, *env*, *scanner*, *path*)

```
Return the included implicit dependencies in this file.
Cache results so we only scan the file once per path
regardless of how many times this information is requested.
```

Overrides: SCons.Node.Node.get_found_includes

push_to_cache(*self*)

```
Try to push the node into a cache


```

Overrides: SCons.Node.Node.push_to_cache

retrieve_from_cache(*self*)

```
Try to retrieve the node's content from a cache

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff in
built().

Returns true iff the node was successfully retrieved.
```

Overrides: SCons.Node.Node.retrieve_from_cache

visited(*self*)

```
Called just after this node has been visited (with or
without a build).
```

Overrides: SCons.Node.Node.visited extit(inherited documentation)

find_src_builder(*self*)

has_src_builder(*self*)

```
Return whether this Node has a source builder or not.

If this Node doesn't have an explicit source code builder, this
is where we figure out, on the fly, if there's a transparent
source code builder for it.

Note that if we found a source builder, we also set the
self.builder attribute, so that all of the methods that actually
*build* this file don't have to do anything different.
```

alter_targets(*self*)

```
Return any corresponding targets in a variant directory.


```

Overrides: SCons.Node.Node.alter_targets

make_ready(*self*)
Get a Node ready for evaluation.

This is called before the Taskmaster decides if the Node is
up-to-date or not. Overriding this method allows for a Node
subclass to be disambiguated if necessary, or for an implicit
source builder to be attached.

Overrides: SCons.Node.Node.make_ready extit(inherited documentation)

prepare(*self*)

Prepare for this file to be created.

Overrides: SCons.Node.Node.prepare

remove(*self*)

Remove this file.

Overrides: SCons.Node.Node.remove

do_duplicate(*self*, *src*)

exists(*self*)
Does this node exists?

Overrides: SCons.Node.FS.Base.exists

get_max_drift_csig(*self*)

Returns the content signature currently stored for this node
if it's been unmodified longer than the max_drift value, or the
max_drift value is 0. Returns None otherwise.

get_csig(*self*)

Generate a node's content signature, the digested signature
of its content.

node - the node
cache - alternate node to use for the signature cache
returns - the content signature

Overrides: SCons.Node.Node.get_csig

builder_set(*self*, *builder*)
Overrides: SCons.Node.Node.builder_set

changed_content(*self*, *target*, *prev_ni*)

changed_state(*self*, *target*, *prev_ni*)

changed_timestamp_then_content(*self*, *target*, *prev_ni*)

changed_timestamp_newer(*self*, *target*, *prev_ni*)

changed_timestamp_match(*self*, *target*, *prev_ni*)

decide_source(*self*, *target*, *prev_ni*)

```
Must be overridden in a specific subclass to return True if this
Node (a dependency) has changed since the last time it was used
to build the specified target.  prev_ni is this Node's state (for
example, its file timestamp, length, maybe content signature)
as of the last time the target was built.

Note that this method is called through the dependency, not the
target, because a dependency Node must be able to use its own
logic to decide if it changed.  For example, File Nodes need to
obey if we're configured to use timestamps, but Python Value Nodes
never use timestamps and always use the content.  If this method
were called through the target, then each Node's implementation
of this method would have to have more complicated logic to
handle all the different Node types on which it might depend.
```

decide_target(*self*, *target*, *prev_ni*)

changed_since_last_build(*self*, *target*, *prev_ni*)

```
Must be overridden in a specific subclass to return True if this
Node (a dependency) has changed since the last time it was used
to build the specified target.  prev_ni is this Node's state (for
example, its file timestamp, length, maybe content signature)
as of the last time the target was built.

Note that this method is called through the dependency, not the
target, because a dependency Node must be able to use its own
logic to decide if it changed.  For example, File Nodes need to
obey if we're configured to use timestamps, but Python Value Nodes
never use timestamps and always use the content.  If this method
were called through the target, then each Node's implementation
of this method would have to have more complicated logic to
handle all the different Node types on which it might depend.
```

Overrides: SCons.Node.Node.changed_since_last_build extit(inherited documentation)

is_up_to_date(*self*)

```
Default check for whether the Node is current: unknown Node
subtypes are always out of date, so they will always get built.
```

Overrides: SCons.Node.Node.is_up_to_date extit(inherited documentation)

rfile(*self*)
Overrides: SCons.Node.FS.Base.rfile

rstr(*self*)
```
A Node.FS.Base object's string representation is its path
name.
```
Overrides: SCons.Node.FS.Base.rstr extit(inherited documentation)

get_cachedir_csig(*self*)

```
Fetch a Node's content signature for purposes of computing
another Node's cachesig.

This is a wrapper around the normal get_csig() method that handles
the somewhat obscure case of using CacheDir with the -n option.
Any files that don't exist would normally be "built" by fetching
them from the cache, but the normal get_csig() method will try
to open up the local file, which doesn't exist because the -n
option meant we didn't actually pull the file from cachedir.
But since the file *does* actually exist in the cachedir, we
can use its contents for the csig.
```
Overrides: SCons.Node.Node.get_cachedir_csig

get_cachedir_bsig(*self*)

Decider(*self*, *function*)

RDirs(*self*, *pathlist*)

```
Search for a list of directories in the Repository list.
```

Rfindalldirs(*self*, *pathlist*)

```
Return all of the directories for a given path list, including
corresponding "backing" directories in any repositories.

The Node lookups are relative to this Node (typically a
directory), so memoizing result saves cycles from looking
up the same path for each target in a given directory.
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*self*)

```
A Node.FS.Base object's string representation is its path
name.
```

Overrides: object.__str__

add_dependency(*self*, *depend*)

```
Adds dependencies.
```

add_ignore(*self*, *depend*)

```
Adds dependencies to ignore.
```

add_prerequisite(*self*, *prerequisite*)

```
Adds prerequisites
```

add_source(*self*, *source*)

```
Adds sources.
```

add_to_implicit(*self*, *deps*)

add_to_waiting_parents(*self*, *node*)

```
Returns the number of nodes added to our waiting parents list:
1 if we add a unique waiting parent, 0 if not.  (Note that the
returned values are intended to be used to increment a reference
count, so don't think you can "clean up" this function by using
True and False instead...)
```

add_to_waiting_s_e(*self*, *node*)

add_wkid(*self*, *wkid*)

```
Add a node to the list of kids waiting to be evaluated
```

all_children(*self*, *scan*=1)

```
Return a list of all the node's direct children.
```

build(*self*, ***kw*)

```
Actually build the node.

This is called by the Taskmaster after it's decided that the
Node is out-of-date and must be rebuilt, and after the prepare()
method has gotten everything, uh, prepared.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff
in built().
```

built(*self*)

```
Called just after this node is successfully built.
```

changed(*self*, *node*=False)

```
Returns if the node is up-to-date with respect to the BuildInfo
stored last time it was built.  The default behavior is to compare
it against our own previously stored BuildInfo, but the stored
BuildInfo from another Node (typically one in a Repository)
can be used instead.

Note that we now *always* check every dependency.  We used to
short-circuit the check by returning as soon as we detected
any difference, but we now rely on checking every dependency
to make sure that any necessary Node information (for example,
the content signature of an #included .h file) is updated.
```

children(*self*, *scan*=1)

```
Return a list of the node's direct children, minus those
that are ignored by this node.
```

children_are_up_to_date(*self*)

```
Alternate check for whether the Node is current:  If all of
our children were up-to-date, then this Node was up-to-date, too.

The SCons.Node.Alias and SCons.Node.Python.Value subclasses
rebind their current() method to this method.
```

clear(*self*)

```
Completely clear a Node of all its cached state (so that it
can be re-evaluated by interfaces that do continuous integration
builds).
```

clear_memoized_values(*self*)

del_binfo(*self*)

```
Delete the build info from this node.
```

disambiguate(*self*, *must_exist*=False)

do_not_store_info(*self*)

env_set(*self*, *env*, *safe*=0)

executor_cleanup(*self*)

```
Let the executor clean up any cached information.
```

explain(*self*)

for_signature(*self*)

```
Return a string representation of the Node that will always
be the same for this particular Node, no matter what.  This
is by contrast to the __str__() method, which might, for
instance, return a relative path for a file Node.  The purpose
of this method is to generate a value to be used in signature
calculation for the command line used to build a target, and
we use this method instead of str() to avoid unnecessary
rebuilds.  This method does not need to return something that
would actually work in a command line; it can return any kind of
nonsense, so long as it does not change.
```

Overrides: SCons.Node.Node.for_signature extit(inherited documentation)

get_abspath(*self*)

```
Get the absolute path of the file.
```

Overrides: SCons.Node.Node.get_abspath

get_binfo(*self*)

```
Fetch a node's build information.

node - the node whose sources will be collected
cache - alternate node to use for the signature cache
returns - the build signature

This no longer handles the recursive descent of the
node's children's signatures.  We expect that they're
already built and updated by someone else, if that's
what's wanted.
```

get_build_env(*self*)

```
Fetch the appropriate Environment to build this node.
```

get_build_scanner_path(*self*, *scanner*)

```
Fetch the appropriate scanner path for this node.
```

get_builder(*self*, *default_builder*=`False`)

```
Return the set builder, or a specified default value
```

get_dir(*self*)

get_env(*self*)

get_env_scanner(*self*, *env*, *kw*={})

get_executor(*self*, *create*=`1`)

```
Fetch the action executor for this node.  Create one if
there isn't already one, and requested to do so.
```

get_implicit_deps(*self*, *env*, *scanner*, *path*)

```
Return a list of implicit dependencies for this node.

This method exists to handle recursive invocation of the scanner
on the implicit dependencies returned by the scanner, if the
scanner's recursive flag says that we should.
```

get_ninfo(*self*)

get_path(*self*, *dir*=False)

```
Return path relative to the current working directory of the
Node.FS.Base object that owns us.
```

get_source_scanner(*self*, *node*)

```
Fetch the source scanner for the specified node

NOTE:  "self" is the target being built, "node" is
the source file for which we want to fetch the scanner.

Implies self.has_builder() is true; again, expect to only be
called from locations where this is already verified.

This function may be called very often; it attempts to cache
the scanner found to improve performance.
```

get_state(*self*)

get_string(*self*, *for_signature*)

```
This is a convenience function designed primarily to be
used in command generators (i.e., CommandGeneratorActions or
Environment variables that are callable), which are called
with a for_signature argument that is nonzero if the command
generator is being called to generate a signature for the
command line, which determines if we should rebuild or not.

Such command generators should use this method in preference
to str(Node) when converting a Node to a string, passing
in the for_signature parameter, such that we will call
Node.for_signature() or str(Node) properly, depending on whether
we are calculating a signature or actually constructing a
command line.
```

get_subst_proxy(*self*)

```
This method is expected to return an object that will function
exactly like this Node, except that it implements any additional
special features that we would like to be in effect for
Environment variable substitution.  The principle use is that
some Nodes would like to implement a __getattr__() method,
but putting that in the Node type itself has a tendency to kill
performance.  We instead put it in a proxy and return it from
this method.  It is legal for this method to return self
if no new functionality is needed for Environment substitution.
```

Overrides: SCons.Node.Node.get_subst_proxy extit(inherited documentation)

get_suffix(*self*)
Overrides: SCons.Node.Node.get_suffix

get_target_scanner(*self*)

getmtime(*self*)

getsize(*self*)

has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

has_explicit_builder(*self*)

```
Return whether this Node has an explicit builder

This allows an internal Builder created by SCons to be marked
non-explicit, so that it can be overridden by an explicit
builder that the user supplies (the canonical example being
directories).
```

is_derived(*self*)

```
Returns true iff this node is derived (i.e. built).

This should return true only for nodes whose path should be in
the variant directory when duplicate=0 and should contribute their build
signatures when they are used as source files to other derived files. For
example: source with source builders are not derived in this sense,
and hence should not return true.
```

is_literal(*self*)

```
Always pass the string representation of a Node to
the command interpreter literally.
```

is_under(*self*, *dir*)

isdir(*self*)

isfile(*self*)

islink(*self*)

missing(*self*)

multiple_side_effect_has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

must_be_same(*self*, *klass*)

```
This node, which already existed, is being looked up as the
specified klass.  Raise an exception if it isn't.
```

new_binfo(*self*)

new_ninfo(*self*)

postprocess(*self*)

```
Clean up anything we don't need to hang onto after we've
been built.
```

render_include_tree(*self*)

```
Return a text representation, suitable for displaying to the
user, of the include tree for the sources of this node.
```

rentry(*self*)

reset_executor(*self*)

```
Remove cached executor; forces recompute when needed.
```

rexists(*self*)
```
Does this node exist locally or in a repositiory?
```
Overrides: SCons.Node.Node.rexists extit(inherited documentation)

scan(*self*)

```
Scan this node's dependents for implicit dependencies.
```

select_scanner(*self*, *scanner*)

```
Selects a scanner for this Node.

This is a separate method so it can be overridden by Node
subclasses (specifically, Node.FS.Dir) that *must* use their
own Scanner and don't select one the Scanner.Selector that's
configured for the target.
```

set_always_build(*self*, *always_build*=1)

```
Set the Node's always_build value.
```

set_executor(*self*, *executor*)

```
Set the action executor for this node.
```

set_explicit(*self*, *is_explicit*)

set_local(*self*)

set_nocache(*self*, *nocache*=1)

```
Set the Node's nocache value.
```

set_noclean(*self*, *noclean*=1)

```
Set the Node's noclean value.
```

set_precious(*self*, *precious*=1)

```
Set the Node's precious value.
```

set_specific_source(*self*, *source*)

set_src_builder(*self*, *builder*)

```
Set the source code builder for this node.
```

set_state(*self*, *state*)

src_builder(*self*)

```
Fetch the source code builder for this node.

If there isn't one, we cache the source code builder specified
for the directory (which in turn will cache the value from its
parent directory, and so on up to the file system root).
```

srcnode(*self*)

```
If this node is in a build path, return the node
corresponding to its source file.  Otherwise, return
ourself.
```

stat(*self*)

state_has_changed(*self*, *target*, *prev_ni*)

str_for_display(*self*)

target_from_source(*self*, *prefix*, *suffix*, *splitext*=<function splitext at 0x8415c34>)

```
Generates a target entry that corresponds to this entry (usually
a source file) with the specified prefix and suffix.

Note that this method can be overridden dynamically for generated
files that need different behavior.  See Tool/swig.py for
an example.
```

15.16.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.16.3 Class Variables

Name	Description
memoizer_counters	**Value:** []
md5_chunksize	**Value:** 64
convert_copy_attrs	**Value:** ['bsources', 'bimplicit', 'bdepends', 'bact', 'bactsig', ...
convert_sig_attrs	**Value:** ['bsourcesigs', 'bimplicitsigs', 'bdependsigs']
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass

15.17 Class FileFinder

object
└ **SCons.Node.FS.FileFinder**

15.17.1 Methods

__init__(*self*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

filedir_lookup(*self*, *p*, *fd*=`False`)

```
A helper method for find_file() that looks up a directory for
a file we're trying to find.  This only creates the Dir Node if
it exists on-disk, since if the directory doesn't exist we know
we won't find any files in it...  :-)

It would be more compact to just use this as a nested function
with a default keyword argument (see the commented-out version
below), but that doesn't work unless you have nested scopes,
so we define it here just so this work under Python 1.5.2.
```

find_file(*self*, *filename*, *paths*, *verbose*=`False`)

```
find_file(str, [Dir()]) -> [nodes]

filename - a filename to find
paths - a list of directory path *nodes* to search in.  Can be
        represented as a list, a tuple, or a callable that is
        called with no arguments and returns the list or tuple.

returns - the node created from the found file.

Find a node corresponding to either a derived file or a file
that exists already.

Only the first file found is returned, and none is returned
if no file is found.
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

15.17.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

15.17.3 Class Variables

Name	Description
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass
memoizer_counters	**Value:** []

16 Module SCons.Node.Python

`scons.Node.Python`

`Python nodes.`

16.1 Variables

Name	Description
__revision__	**Value:** `'src/engine/SCons/Node/Python.py 5023 2010/06/14 22:05:46...`

16.2 Class ValueNodeInfo

object
└ SCons.Node.NodeInfoBase
└ **SCons.Node.Python.ValueNodeInfo**

`The generic base class for signature information for a Node.`

`Node subclasses should subclass NodeInfoBase to provide their own logic for dealing with their own Node-specific signature information.`

16.2.1 Methods

str_to_node(*self*, *s*)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__init__(*self*, *node*=`False`)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

convert(*self*, *node*, *val*)

format(*self*, *field_list*=`False`, *names*=`0`)

merge(*self*, *other*)

update(*self*, *node*)

16.2.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

16.2.3 Class Variables

Name	Description
current_version_id	**Value:** `1`
field_list	**Value:** `['csig']`

16.3 Class ValueBuildInfo

object
SCons.Node.BuildInfoBase
SCons.Node.Python.ValueBuildInfo

```
The generic base class for build information for a Node.

This is what gets stored in a .sconsign file for each target file.
It contains a NodeInfo instance for this node (signature information
that's specific to the type of Node) and direct attributes for the
generic build stuff we have to track:  sources, explicit dependencies,
implicit dependencies, and action information.
```

16.3.1 Methods

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *node*=False)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

merge(*self*, *other*)

16.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

16.3.3 Class Variables

Name	Description
current_version_id	**Value:** 1

16.4 Class Value

object
SCons.Node.Node
SCons.Node.Python.Value

```
A class for Python variables, typically passed on the command line
or generated by a script, but not from a file or some other source.
```

16.4.1 Methods

__init__(*self*, *value*, *built_value*=False)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: SCons.Node.Node.__init__

str_for_display(*self*)

__str__(*self*)
`str(x)`
Overrides: object.__str__ extit(inherited documentation)

make_ready(*self*)
Get a Node ready for evaluation.

This is called before the Taskmaster decides if the Node is
up-to-date or not. Overriding this method allows for a Node
subclass to be disambiguated if necessary, or for an implicit
source builder to be attached.

Overrides: SCons.Node.Node.make_ready extit(inherited documentation)

build(*self*, ***kw*)
Actually build the node.

This is called by the Taskmaster after it's decided that the
Node is out-of-date and must be rebuilt, and after the prepare()
method has gotten everything, uh, prepared.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff
in built().

Overrides: SCons.Node.Node.build extit(inherited documentation)

is_up_to_date(*self*)

Alternate check for whether the Node is current: If all of
our children were up-to-date, then this Node was up-to-date, too.

The SCons.Node.Alias and SCons.Node.Python.Value subclasses
rebind their current() method to this method.

Overrides: SCons.Node.Node.is_up_to_date

is_under(*self*, *dir*)

write(*self*, *built_value*)

Set the value of the node.

read(*self*)

Return the value. If necessary, the value is built.

get_text_contents(*self*)

By the assumption that the node.built_value is a
deterministic product of the sources, the contents of a Value
are the concatenation of all the contents of its sources. As
the value need not be built when get_contents() is called, we
cannot use the actual node.built_value.

get_contents(*self*)

```
By the assumption that the node.built_value is a
deterministic product of the sources, the contents of a Value
are the concatenation of all the contents of its sources.  As
the value need not be built when get_contents() is called, we
cannot use the actual node.built_value.
```

changed_since_last_build(*self*, *target*, *prev_ni*)

```
Must be overridden in a specific subclass to return True if this
Node (a dependency) has changed since the last time it was used
to build the specified target.  prev_ni is this Node's state (for
example, its file timestamp, length, maybe content signature)
as of the last time the target was built.

Note that this method is called through the dependency, not the
target, because a dependency Node must be able to use its own
logic to decide if it changed.  For example, File Nodes need to
obey if we're configured to use timestamps, but Python Value Nodes
never use timestamps and always use the content.  If this method
were called through the target, then each Node's implementation
of this method would have to have more complicated logic to
handle all the different Node types on which it might depend.
```

Overrides: SCons.Node.Node.changed_since_last_build extit(inherited documentation)

get_csig(*self*, *calc*=`False`)

```
Because we're a Python value node and don't have a real
timestamp, we get to ignore the calculator and just use the
value contents.
```

Overrides: SCons.Node.Node.get_csig

Decider(*self*, *function*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

add_dependency(*self*, *depend*)

```
Adds dependencies.
```

add_ignore(*self*, *depend*)

```
Adds dependencies to ignore.
```

add_prerequisite(*self*, *prerequisite*)

```
Adds prerequisites
```

add_source(*self*, *source*)

```
Adds sources.
```

add_to_implicit(*self*, *deps*)

add_to_waiting_parents(*self*, *node*)

```
Returns the number of nodes added to our waiting parents list:
1 if we add a unique waiting parent, 0 if not.  (Note that the
returned values are intended to be used to increment a reference
count, so don't think you can "clean up" this function by using
True and False instead...)
```

add_to_waiting_s_e(*self*, *node*)

add_wkid(*self*, *wkid*)

```
Add a node to the list of kids waiting to be evaluated
```

all_children(*self*, *scan*=1)

```
Return a list of all the node's direct children.
```

alter_targets(*self*)

```
Return a list of alternate targets for this Node.
```

builder_set(*self*, *builder*)

built(*self*)

```
Called just after this node is successfully built.
```

changed(*self*, *node*=False)

```
Returns if the node is up-to-date with respect to the BuildInfo
stored last time it was built.  The default behavior is to compare
it against our own previously stored BuildInfo, but the stored
BuildInfo from another Node (typically one in a Repository)
can be used instead.

Note that we now *always* check every dependency.  We used to
short-circuit the check by returning as soon as we detected
any difference, but we now rely on checking every dependency
to make sure that any necessary Node information (for example,
the content signature of an #included .h file) is updated.
```

children(*self*, *scan*=1)

```
Return a list of the node's direct children, minus those
that are ignored by this node.
```

children_are_up_to_date(*self*)

```
Alternate check for whether the Node is current:  If all of
our children were up-to-date, then this Node was up-to-date, too.

The SCons.Node.Alias and SCons.Node.Python.Value subclasses
rebind their current() method to this method.
```

clear(*self*)

```
Completely clear a Node of all its cached state (so that it
can be re-evaluated by interfaces that do continuous integration
builds).
```

clear_memoized_values(*self*)

del_binfo(*self*)

Delete the build info from this node.

disambiguate(*self*, *must_exist*=False)

do_not_store_info(*self*)

env_set(*self*, *env*, *safe*=0)

executor_cleanup(*self*)

Let the executor clean up any cached information.

exists(*self*)

Does this node exists?

explain(*self*)

for_signature(*self*)

Return a string representation of the Node that will always
be the same for this particular Node, no matter what. This
is by contrast to the __str__() method, which might, for
instance, return a relative path for a file Node. The purpose
of this method is to generate a value to be used in signature
calculation for the command line used to build a target, and
we use this method instead of str() to avoid unnecessary
rebuilds. This method does not need to return something that
would actually work in a command line; it can return any kind of
nonsense, so long as it does not change.

get_abspath(*self*)

Return an absolute path to the Node. This will return simply
str(Node) by default, but for Node types that have a concept of
relative path, this might return something different.

get_binfo(*self*)

```
Fetch a node's build information.

node - the node whose sources will be collected
cache - alternate node to use for the signature cache
returns - the build signature

This no longer handles the recursive descent of the
node's children's signatures.  We expect that they're
already built and updated by someone else, if that's
what's wanted.
```

get_build_env(*self*)

```
Fetch the appropriate Environment to build this node.
```

get_build_scanner_path(*self*, *scanner*)

```
Fetch the appropriate scanner path for this node.
```

get_builder(*self*, *default_builder*=False)

```
Return the set builder, or a specified default value
```

get_cachedir_csig(*self*)

get_env(*self*)

get_env_scanner(*self*, *env*, *kw*={})

get_executor(*self*, *create*=1)

```
Fetch the action executor for this node.  Create one if
there isn't already one, and requested to do so.
```

get_found_includes(*self*, *env*, *scanner*, *path*)

```
Return the scanned include lines (implicit dependencies)
found in this node.

The default is no implicit dependencies.  We expect this method
to be overridden by any subclass that can be scanned for
implicit dependencies.
```

get_implicit_deps(*self*, *env*, *scanner*, *path*)

```
Return a list of implicit dependencies for this node.

This method exists to handle recursive invocation of the scanner
on the implicit dependencies returned by the scanner, if the
scanner's recursive flag says that we should.
```

get_ninfo(*self*)

get_source_scanner(*self*, *node*)

```
Fetch the source scanner for the specified node

NOTE:  "self" is the target being built, "node" is
the source file for which we want to fetch the scanner.

Implies self.has_builder() is true; again, expect to only be
called from locations where this is already verified.

This function may be called very often; it attempts to cache
the scanner found to improve performance.
```

get_state(*self*)

get_stored_implicit(*self*)

```
Fetch the stored implicit dependencies
```

get_stored_info(*self*)

get_string(*self*, *for_signature*)

```
This is a convenience function designed primarily to be
used in command generators (i.e., CommandGeneratorActions or
Environment variables that are callable), which are called
with a for_signature argument that is nonzero if the command
generator is being called to generate a signature for the
command line, which determines if we should rebuild or not.

Such command generators should use this method in preference
to str(Node) when converting a Node to a string, passing
in the for_signature parameter, such that we will call
Node.for_signature() or str(Node) properly, depending on whether
we are calculating a signature or actually constructing a
command line.
```

get_subst_proxy(*self*)

```
This method is expected to return an object that will function
exactly like this Node, except that it implements any additional
special features that we would like to be in effect for
Environment variable substitution.  The principle use is that
some Nodes would like to implement a __getattr__() method,
but putting that in the Node type itself has a tendency to kill
performance.  We instead put it in a proxy and return it from
this method.  It is legal for this method to return self
if no new functionality is needed for Environment substitution.
```

get_suffix(*self*)

get_target_scanner(*self*)

has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

has_explicit_builder(*self*)

```
Return whether this Node has an explicit builder

This allows an internal Builder created by SCons to be marked
non-explicit, so that it can be overridden by an explicit
builder that the user supplies (the canonical example being
directories).
```

is_derived(*self*)

```
Returns true iff this node is derived (i.e. built).

This should return true only for nodes whose path should be in
the variant directory when duplicate=0 and should contribute their build
signatures when they are used as source files to other derived files. For
example: source with source builders are not derived in this sense,
and hence should not return true.
```

is_literal(*self*)

```
Always pass the string representation of a Node to
the command interpreter literally.
```

missing(*self*)

multiple_side_effect_has_builder(*self*)

```
Return whether this Node has a builder or not.

In Boolean tests, this turns out to be a *lot* more efficient
than simply examining the builder attribute directly ("if
node.builder: ..."). When the builder attribute is examined
directly, it ends up calling __getattr__ for both the __len__
and __nonzero__ attributes on instances of our Builder Proxy
class(es), generating a bazillion extra calls and slowing
things down immensely.
```

new_binfo(*self*)

new_ninfo(*self*)

postprocess(*self*)

```
Clean up anything we don't need to hang onto after we've
been built.
```

prepare(*self*)

```
Prepare for this Node to be built.

This is called after the Taskmaster has decided that the Node
is out-of-date and must be rebuilt, but before actually calling
the method to build the Node.

This default implementation checks that explicit or implicit
dependencies either exist or are derived, and initializes the
BuildInfo structure that will hold the information about how
this node is, uh, built.

(The existence of source files is checked separately by the
Executor, which aggregates checks for all of the targets built
by a specific action.)

Overriding this method allows for for a Node subclass to remove
the underlying file from the file system.  Note that subclass
methods should call this base class method to get the child
check and the BuildInfo structure.
```

push_to_cache(*self*)

```
Try to push a node into a cache
```

remove(*self*)

```
Remove this Node:  no-op by default.
```

render_include_tree(*self*)

```
Return a text representation, suitable for displaying to the
user, of the include tree for the sources of this node.
```

reset_executor(*self*)

```
Remove cached executor; forces recompute when needed.
```

retrieve_from_cache(*self*)

```
Try to retrieve the node's content from a cache

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here. Do thread unsafe stuff in
built().

Returns true iff the node was successfully retrieved.
```

rexists(*self*)

```
Does this node exist locally or in a repositiory?
```

scan(*self*)

```
Scan this node's dependents for implicit dependencies.
```

scanner_key(*self*)

select_scanner(*self*, *scanner*)

```
Selects a scanner for this Node.

This is a separate method so it can be overridden by Node
subclasses (specifically, Node.FS.Dir) that *must* use their
own Scanner and don't select one the Scanner.Selector that's
configured for the target.
```

set_always_build(*self*, *always_build*=1)

```
Set the Node's always_build value.
```

set_executor(*self*, *executor*)

```
Set the action executor for this node.
```

set_explicit(*self*, *is_explicit*)

set_nocache(*self*, *nocache*=1)

```
Set the Node's nocache value.
```

set_noclean(*self*, *noclean*=1)

```
Set the Node's noclean value.
```

set_precious(*self*, *precious*=1)

```
Set the Node's precious value.
```

set_specific_source(*self*, *source*)

set_state(*self*, *state*)

state_has_changed(*self*, *target*, *prev_ni*)

store_info(*self*)

```
Make the build signature permanent (that is, store it in the
.sconsign file or equivalent).
```

visited(*self*)

```
Called just after this node has been visited (with or
without a build).
```

16.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

16.4.3 Class Variables

Name	Description
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass
memoizer_counters	**Value:** []

17 Module SCons.PathList

```
SCons.PathList

A module for handling lists of directory paths (the sort of things
that get set as CPPPATH, LIBPATH, etc.) with as much caching of data and
efficiency as we can while still keeping the evaluation delayed so that we
Do the Right Thing (almost) regardless of how the variable is specified.
```

17.1 Functions

node_conv(*obj*)

```
This is the "string conversion" routine that we have our substitutions
use to return Nodes, not strings.  This relies on the fact that an
EntryProxy object has a get() method that returns the underlying
Node that it wraps, which is a bit of architectural dependence
that we might need to break or modify in the future in response to
additional requirements.
```

PathList(*pathlist*)

```
Returns the cached _PathList object for the specified pathlist,
creating and caching a new object as necessary.
```

17.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/PathList.py 5023 2010/06/14 22:05:46 sc...
__doc__	**Value:** """SCons.PathL...
TYPE_STRING_NO_SUBST	**Value:** 0
TYPE_STRING_SUBST	**Value:** 1
TYPE_OBJECT	**Value:** 2

18 Module SCons.SConf

SCons.SConf

Autoconf-like configuration support.

18.1 Functions

SetBuildType(*type*)

SetCacheMode(*mode*)

Set the Configure cache mode. mode must be one of "auto", "force",
or "cache".

SetProgressDisplay(*display*)

Set the progress display to use (called from SCons.Script)

CreateConfigHBuilder(*env*)

Called just before the building targets phase begins.

SConf(**args*, ***kw*)

CheckFunc(*context*, *function_name*, *header*=False, *language*=False)

CheckType(*context*, *type_name*, *includes*='', *language*=False)

CheckTypeSize(*context*, *type_name*, *includes*='', *language*=False, *expect*=False)

CheckDeclaration(*context*, *declaration*, *includes*='', *language*=False)

createIncludesFromHeaders(*headers*, *leaveLast*, *include_quotes*='""')

CheckHeader(*context*, *header*, *include_quotes*='<>', *language*=False)

A test for a C or C++ header file.

CheckCC(*context*)

CheckCXX(*context*)

CheckSHCC(*context*)

CheckSHCXX(*context*)

CheckCHeader(*context*, *header*, *include_quotes*=’"""’)

A test for a C header file.

CheckCXXHeader(*context*, *header*, *include_quotes*=’"""’)

A test for a C++ header file.

CheckLib(*context*, *library*=False, *symbol*=’main’, *header*=False, *language*=False, *autoadd*=1)

A test for a library. See also CheckLibWithHeader.
Note that library may also be None to test whether the given symbol
compiles without flags.

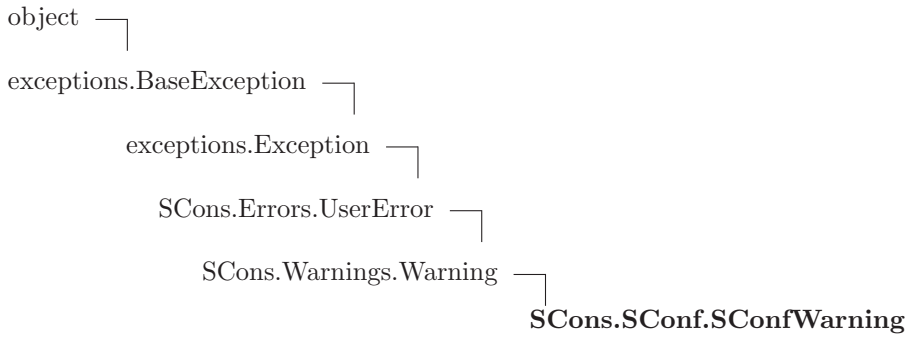
CheckLibWithHeader(*context*, *libs*, *header*, *language*, *call*=False, *autoadd*=1)

Another (more sophisticated) test for a library.
Checks, if library and header is available for language (may be ’C’
or ’CXX’). Call maybe be a valid expression _with_ a trailing ’;’.
As in CheckLib, we support library=None, to test if the call compiles
without extra link flags.

18.2 Variables

Name	Description
__revision__	**Value:** ’src/engine/SCons/SConf.py 5023 2010/06/14 22:05:46 scons’
build_type	**Value:** False
build_types	**Value:** [’clean’, ’help’]
dryrun	**Value:** 0
AUTO	**Value:** 0
FORCE	**Value:** 1
CACHE	**Value:** 2
cache_mode	**Value:** 0
progress_display	**Value:** SCons.Util.display
SConfFS	**Value:** False
sconf_global	**Value:** False

18.3 Class SConfWarning



18.3.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)
helper for pickle
Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)
helper for pickle

__repr__(*x*)
repr(x)
Overrides: object.__repr__

__setattr__(...)
x.__setattr__('name', value) <==> x.name = value
Overrides: object.__setattr__

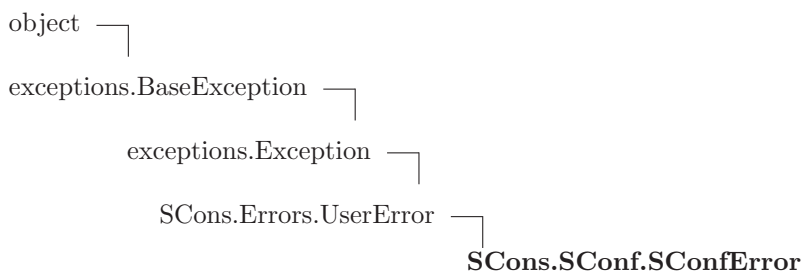
__setstate__(...)

__str__(*x*)
str(x)
Overrides: object.__str__

18.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

18.4 Class SConfError



Known Subclasses: SCons.SConf.ConfigureCacheError, SCons.SConf.ConfigureDryRunError

18.4.1 Methods

__init__(*self*, *msg*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: exceptions.Exception.__init__ extit(inherited documentation)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

Overrides: object.__delattr__

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

`x[y]`

__getslice__(*x*, *i*, *j*)

`x[i:j]`

`Use of negative indices is not supported.`

__hash__(*x*)

`hash(x)`

__new__(*T*, *S*, *...*)

Return Value

`a new object with type S, a subtype of T`

Overrides: exceptions.BaseException.__new__

__reduce__(*...*)
`helper for pickle`

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(*...*)

`helper for pickle`

__repr__(*x*)

`repr(x)`

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

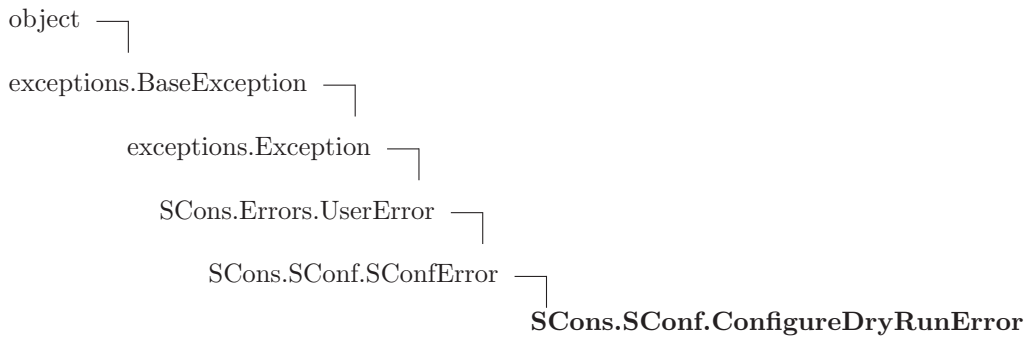
```
str(x)
```

Overrides: object.__str__

18.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

18.5 Class ConfigureDryRunError




```
Raised when a file or directory needs to be updated during a Configure
process, but the user requested a dry-run
```

18.5.1 Methods

__init__(*self*, *target*)
Overrides: SCons.SConf.SConfError.__init__

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

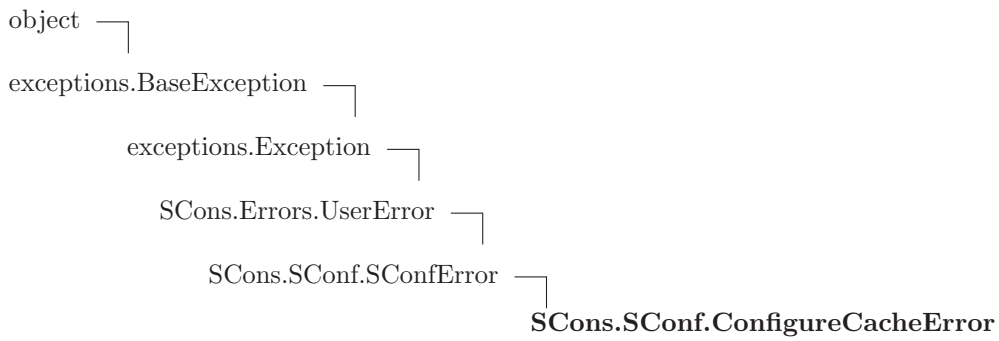
```
str(x)
```

Overrides: object.__str__

18.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

18.6 Class ConfigureCacheError




```
Raised when a use explicitely requested the cache feature, but the test
is run the first time.
```

18.6.1 Methods

__init__(*self*, *target*)
Overrides: SCons.SConf.SConfError.__init__

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(*...*)

__str__(*x*)

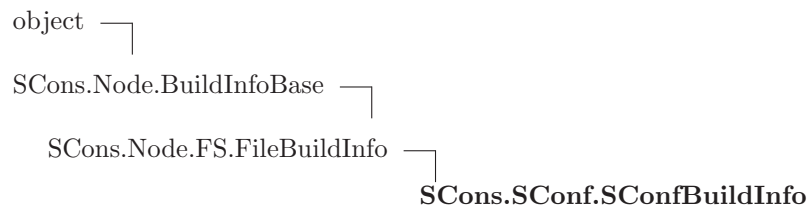
```
str(x)
```

Overrides: object.__str__

18.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

18.7 Class SConfBuildInfo




```
Special build info for targets of configure tests. Additional members
are result (did the builder succeed last time?) and string, which
contains messages of the original build phase.
```

18.7.1 Methods

set_build_result(*self*, *result*, *string*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *node*=False)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

convert_from_sconsign(*self*, *dir*, *name*)

```
Converts a newly-read FileBuildInfo object for in-SCons use

For normal up-to-date checking, we don't have any conversion to
perform--but we're leaving this method here to make that clear.
```

convert_to_sconsign(*self*)

```
Converts this FileBuildInfo object for writing to a .sconsign file

This replaces each Node in our various dependency lists with its
usual string representation: relative to the top-level SConstruct
directory, or an absolute path if it's outside.
```

format(*self*, *names*=0)

merge(*self*, *other*)

prepare_dependencies(*self*)

```
Prepares a FileBuildInfo object for explaining what changed

The bsources, bdepends and bimplicit lists have all been
stored on disk as paths relative to the top-level SConstruct
directory.  Convert the strings to actual Nodes (for use by the
--debug=explain code and --implicit-cache).
```

18.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

18.7.3 Class Variables

Name	Description
result	**Value:** `False`
string	**Value:** `False`
current_version_id	**Value:** `1`

18.8 Class Streamer

object
└ **SCons.SConf.Streamer**

```
'Sniffer' for a file-like writable object. Similar to the unix tool tee.
```

18.8.1 Methods

__init__(*self*, *orig*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

write(*self*, *str*)

writelines(*self*, *lines*)

getvalue(*self*)

```
Return everything written to orig since the Streamer was created.
```

flush(*self*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

helper for pickle

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

__str__(*x*)

str(x)

18.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

18.9 Class SConfBuildTask

object
SCons.Taskmaster.Task
SCons.Taskmaster.AlwaysTask
SCons.SConf.SConfBuildTask

This is almost the same as SCons.Script.BuildTask. Handles SConfErrors correctly and knows about the current cache_mode.

18.9.1 Methods

display(*self*, *message*)

```
Hook to allow the calling interface to display a message.

This hook gets called as part of preparing a task for execution
(that is, a Node to be built).  As part of figuring out what Node
should be built next, the actually target list may be altered,
along with a message describing the alteration.  The calling
interface can subclass Task and provide a concrete implementation
of this method to see those messages.
```

Overrides: SCons.Taskmaster.Task.display extit(inherited documentation)

display_cached_string(*self*, *bi*)

```
Logs the original builder messages, given the SConfBuildInfo instance
bi.
```

failed(*self*)

```
Default action when a task fails:  stop the build.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

Overrides: SCons.Taskmaster.Task.failed extit(inherited documentation)

collect_node_states(*self*)

execute(*self*)

```
Called to execute the task.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here.  Do thread unsafe stuff in
prepare(), executed() or failed().
```

Overrides: SCons.Taskmaster.Task.execute extit(inherited documentation)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *tm*, *targets*, *top*, *node*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

exc_clear(*self*)

```
Clears any recorded exception.

This also changes the "exception_raise" attribute to point
to the appropriate do-nothing method.
```

exc_info(*self*)

```
Returns info about a recorded exception.
```

exception_set(*self*, *exception*=False)

```
Records an exception to be raised at the appropriate time.

This also changes the "exception_raise" attribute to point
to the method that will, in fact
```

executed(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

executed_with_callbacks(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

executed_without_callbacks(*self*)

```
Called when the task has been successfully executed
and the Taskmaster instance doesn't want to call
the Node's callback methods.
```

fail_continue(*self*)

```
Explicit continue-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

fail_stop(*self*)

```
Explicit stop-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

get_target(*self*)

```
Fetch the target being built or updated by this task.
```

make_ready(*self*)

```
Marks all targets in a task ready for execution if any target
is not current.

This is the default behavior for building only what's necessary.
```

make_ready_all(*self*)

```
Marks all targets in a task ready for execution.

This is used when the interface needs every target Node to be
visited--the canonical example being the "scons -c" option.
```

make_ready_current(*self*)

```
Marks all targets in a task ready for execution if any target
is not current.

This is the default behavior for building only what's necessary.
```

needs_execute(*self*)

```
Always returns True (indicating this Task should always
be executed).

Subclasses that need this behavior (as opposed to the default
of only executing Nodes that are out of date w.r.t. their
dependencies) can use this as follows:

    class MyTaskSubclass(SCons.Taskmaster.Task):
        needs_execute = SCons.Taskmaster.Task.execute_always
```

Overrides: SCons.Taskmaster.Task.needs_execute

postprocess(*self*)

```
Post-processes a task after it's been executed.

This examines all the targets just built (or not, we don't care
if the build was successful, or even if there was no build
because everything was up-to-date) to see if they have any
waiting parent Nodes, or Nodes waiting on a common side effect,
that can be put back on the candidates list.
```

prepare(*self*)

```
Called just before the task is executed.

This is mainly intended to give the target Nodes a chance to
unlink underlying files and make all necessary directories before
the Action is actually called to build the targets.
```

trace_message(*self*, *method*, *node*, *description*='node')

18.9.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

18.10 Class SConfBase

object
└ **SCons.SConf.SConfBase**

```
This is simply a class to represent a configure context. After
creating a SConf object, you can call any tests. After finished with your
tests, be sure to call the Finish() method, which returns the modified
environment.
Some words about caching: In most cases, it is not necessary to cache
Test results explicitely. Instead, we use the scons dependency checking
mechanism. For example, if one wants to compile a test program
(SConf.TryLink), the compiler is only called, if the program dependencies
have changed. However, if the program could not be compiled in a former
SConf run, we need to explicitely cache this error.
```

18.10.1 Methods

__init__(*self*, *env*, *custom_tests*={}, *conf_dir*='$CONFIGUREDIR', *log_file*='$CONFIGURELOG', *config_h*=False, *_depth*=0)

```
Constructor. Pass additional tests in the custom_tests-dictinary,
e.g. custom_tests={'CheckPrivate':MyPrivateTest}, where MyPrivateTest
defines a custom test.
Note also the conf_dir and log_file arguments (you may want to
build tests in the VariantDir, not in the SourceDir)
```

Overrides: object.__init__

Finish(*self*)

```
Call this method after finished with your tests:
env = sconf.Finish()
```

Define(*self*, *name*, *value*=False, *comment*=False)

```
Define a pre processor symbol name, with the optional given value in the
current config header.

If value is None (default), then #define name is written. If value is not
none, then #define name value is written.

comment is a string which will be put as a C comment in the
header, to explain the meaning of the value (appropriate C comments /* and
*/ will be put automatically.
```

BuildNodes(*self*, *nodes*)

```
Tries to build the given nodes immediately. Returns 1 on success,
0 on error.
```

pspawn_wrapper(*self*, *sh*, *escape*, *cmd*, *args*, *env*)

```
Wrapper function for handling piped spawns.

This looks to the calling interface (in Action.py) like a "normal"
spawn, but associates the call with the PSPAWN variable from
the construction environment and with the streams to which we
want the output logged.  This gets slid into the construction
environment as the SPAWN variable so Action.py doesn't have to
know or care whether it's spawning a piped command or not.
```

TryBuild(*self*, *builder*, *text*=False, *extension*='')

```
Low level TryBuild implementation. Normally you don't need to
call that - you can use TryCompile / TryLink / TryRun instead
```

TryAction(*self*, *action*, *text*=False, *extension*='')

```
Tries to execute the given action with optional source file
contents <text> and optional source file extension <extension>,
Returns the status (0 : failed, 1 : ok) and the contents of the
output file.
```

TryCompile(*self*, *text*, *extension*)

```
Compiles the program given in text to an env.Object, using extension
as file extension (e.g. '.c'). Returns 1, if compilation was
successful, 0 otherwise. The target is saved in self.lastTarget (for
further processing).
```

TryLink(*self*, *text*, *extension*)

```
Compiles the program given in text to an executable env.Program,
using extension as file extension (e.g. '.c'). Returns 1, if
compilation was successful, 0 otherwise. The target is saved in
self.lastTarget (for further processing).
```

TryRun(*self*, *text*, *extension*)

```
Compiles and runs the program given in text, using extension
as file extension (e.g. '.c'). Returns (1, outputStr) on success,
(0, '') otherwise. The target (a file containing the program's stdout)
is saved in self.lastTarget (for further processing).
```

AddTest(*self*, *test_name*, *test_instance*)

```
Adds test_class to this SConf instance. It can be called with
self.test_name(...)
```

AddTests(*self*, *tests*)

```
Adds all the tests given in the tests dictionary to this SConf
instance
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

18.10.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

18.11 Class CheckContext

object
└
SCons.SConf.CheckContext

```
Provides a context for configure tests. Defines how a test writes to the
screen and log file.

A typical test is just a callable with an instance of CheckContext as
first argument:

def CheckCustom(context, ...)
context.Message('Checking my weird test ... ')
ret = myWeirdTestFunction(...)
context.Result(ret)

Often, myWeirdTestFunction will be one of
context.TryCompile/context.TryLink/context.TryRun. The results of
those are cached, for they are only rebuild, if the dependencies have
changed.
```

18.11.1 Methods

__init__(*self*, *sconf*)

```
Constructor. Pass the corresponding SConf instance.
```

Overrides: object.__init__

Message(*self*, *text*)

```
Inform about what we are doing right now, e.g.
'Checking for SOMETHING ... '
```

Result(*self*, *res*)

```
Inform about the result of the test. res may be an integer or a
string. In case of an integer, the written text will be 'yes' or 'no'.
The result is only displayed when self.did_show_result is not set.
```

TryBuild(*self*, **args*, ***kw*)

TryAction(*self*, **args*, ***kw*)

TryCompile(*self*, **args*, ***kw*)

TryLink(*self*, **args*, ***kw*)

TryRun(*self*, **args*, ***kw*)

__getattr__(*self*, *attr*)

BuildProg(*self*, *text*, *ext*)

CompileProg(*self*, *text*, *ext*)

CompileSharedObject(*self*, *text*, *ext*)

RunProg(*self*, *text*, *ext*)

AppendLIBS(*self*, *lib_name_list*)

PrependLIBS(*self*, *lib_name_list*)

SetLIBS(*self*, *val*)

Display(*self*, *msg*)

Log(*self*, *msg*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__**setattr**__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__**str**__(x)

```
str(x)
```

18.11.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

19 Module SCons.SConsign

```
SCons.SConsign

Writing and reading information to the .sconsign file or files.
```

19.1 Functions

corrupt_dblite_warning(*filename*)

Get_DataBase(*dir*)

Reset()

```
Reset global state.  Used by unit tests that end up using
SConsign multiple times to get a clean slate for each test.
```

write()

File(*name*, *dbm_module*=False)

```
Arrange for all signatures to be stored in a global .sconsign.db*
file.
```

19.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/SConsign.py 5023 2010/06/14 22:05:46 sc...
sig_files	**Value:** []
DataBase	**Value:** {}
DB_Name	**Value:** '.sconsign'
DB_sync_list	**Value:** []

19.3 Class SConsignEntry

object
└ **SCons.SConsign.SConsignEntry**

```
Wrapper class for the generic entry in a .sconsign file.
The Node subclass populates it with attributes as it pleases.

XXX As coded below, we do expect a '.binfo' attribute to be added,
but we'll probably generalize this in the next refactorings.
```

19.3.1 Methods

__init__(*self*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

convert_to_sconsign(*self*)

convert_from_sconsign(*self*, *dir*, *name*)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__new__(*T*, *S*, *...*)

Return Value

`a new object with type S, a subtype of T`

__reduce__(*...*)

`helper for pickle`

__reduce_ex__(*...*)

`helper for pickle`

__repr__(*x*)

`repr(x)`

__setattr__(*...*)

`x.__setattr__('name', value) <==> x.name = value`

__str__(*x*)

`str(x)`

19.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

19.3.3 Class Variables

Name	Description
current_version_id	**Value:** 1

19.4 Class Base

object
└ **SCons.SConsign.Base**

Known Subclasses: SCons.SConsign.DB, SCons.SConsign.Dir

```
This is the controlling class for the signatures for the collection of
entries associated with a specific directory.  The actual directory
association will be maintained by a subclass that is specific to
the underlying storage method.  This class provides a common set of
methods for fetching and storing the individual bits of information
that make up signature entry.
```

19.4.1 Methods

__init__(*self*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

get_entry(*self*, *filename*)

`Fetch the specified entry attribute.`

set_entry(*self*, *filename*, *obj*)

`Set the entry.`

do_not_set_entry(*self*, *filename*, *obj*)

store_info(*self*, *filename*, *node*)

do_not_store_info(*self*, *filename*, *node*)

merge(*self*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

19.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

19.5 Class DB

object

SCons.SConsign.Base

SCons.SConsign.DB

```
A Base subclass that reads and writes signature information
from a global .sconsign.db* file--the actual file suffix is
determined by the database module.
```

19.5.1 Methods

__init__(*self*, *dir*)
```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```
Overrides: SCons.SConsign.Base.__init__

write(*self*, *sync*=1)

__delattr__(...)
```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)
```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)
```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value
```
    a new object with type S, a subtype of T
```

__reduce__(...)
```
helper for pickle
```

__reduce_ex__(...)
```
helper for pickle
```

__repr__(*x*)
```
repr(x)
```

__setattr__(...)
```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)
```
str(x)
```

do_not_set_entry(*self*, *filename*, *obj*)

do_not_store_info(*self*, *filename*, *node*)

get_entry(*self*, *filename*)

Fetch the specified entry attribute.

merge(*self*)

set_entry(*self*, *filename*, *obj*)

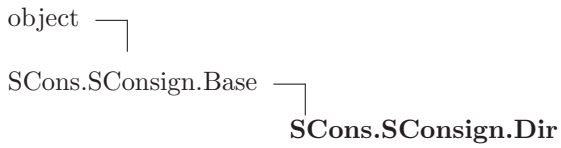
Set the entry.

store_info(*self*, *filename*, *node*)

19.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

19.6 Class Dir



Known Subclasses: SCons.SConsign.DirFile

19.6.1 Methods

__init__(*self*, *fp*=False, *dir*=False)

fp - file pointer to read entries from

Overrides: SCons.SConsign.Base.__init__

__delattr__(*...*)

x.__delattr__('name') <==> del x.name

__getattribute__(*...*)

x.__getattribute__('name') <==> x.name

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

do_not_set_entry(*self*, *filename*, *obj*)

do_not_store_info(*self*, *filename*, *node*)

get_entry(*self*, *filename*)

```
Fetch the specified entry attribute.
```

merge(*self*)

set_entry(*self*, *filename*, *obj*)

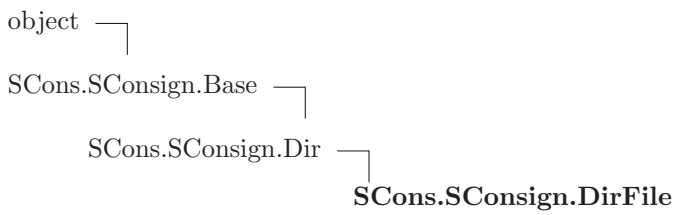
```
Set the entry.
```

store_info(*self*, *filename*, *node*)

19.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

19.7 Class DirFile



Encapsulates reading and writing a per-directory .sconsign file.

19.7.1 Methods

__init__(*self*, *dir*)

dir - the directory for the file

Overrides: SCons.SConsign.Dir.__init__

write(*self*, *sync*=1)

Write the .sconsign file to disk.

Try to write to a temporary file first, and rename it if we
succeed. If we can't write to the temporary file, it's
probably because the directory isn't writable (and if so,
how did we build anything in this directory, anyway?), so
try to write directly to the .sconsign file as a backup.
If we can't rename, try to copy the temporary contents back
to the .sconsign file. Either way, always try to remove
the temporary file at the end.

__delattr__(*...*)

x.__delattr__('name') <==> del x.name

__getattribute__(*...*)

x.__getattribute__('name') <==> x.name

__hash__(*x*)

hash(x)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

do_not_set_entry(*self*, *filename*, *obj*)

do_not_store_info(*self*, *filename*, *node*)

get_entry(*self*, *filename*)

```
Fetch the specified entry attribute.
```

merge(*self*)

set_entry(*self*, *filename*, *obj*)

```
Set the entry.
```

store_info(*self*, *filename*, *node*)

19.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

19.8 Class DB

```
A Base subclass that reads and writes signature information
from a global .sconsign.db* file--the actual file suffix is
determined by the database module.
```

19.8.1 Methods

__init__(*self*, *dir*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: SCons.SConsign.Base.__init__

write(*self*, *sync*=`1`)

__delattr__(*...*)
`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)
`x.__getattribute__('name') <==> x.name`

__hash__(*x*)
`hash(x)`

__new__(*T*, *S*, *...*)

Return Value
`a new object with type S, a subtype of T`

__reduce__(*...*)
`helper for pickle`

__reduce_ex__(*...*)
`helper for pickle`

__repr__(*x*)
`repr(x)`

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

do_not_set_entry(*self*, *filename*, *obj*)

do_not_store_info(*self*, *filename*, *node*)

get_entry(*self*, *filename*)

```
Fetch the specified entry attribute.
```

merge(*self*)

set_entry(*self*, *filename*, *obj*)

```
Set the entry.
```

store_info(*self*, *filename*, *node*)

19.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

20 Package SCons.Scanner

```
SCons.Scanner

The Scanner package for the SCons software construction utility.
```

20.1 Modules

- **C**: SCons.Scanner.C
  This module implements the depenency scanner for C/C++ code.
  (Section 21, p. 342)
- **D**: SCons.Scanner.D
  Scanner for the Digital Mars "D" programming language.
  (Section 22, p. 349)
- **Dir** *(Section 23, p. 352)*
- **Fortran**: SCons.Scanner.Fortran
  This module implements the dependency scanner for Fortran code.
  (Section 24, p. 353)
- **IDL**: SCons.Scanner.IDL
  This module implements the depenency scanner for IDL (Interface Definition Language) files.
  (Section 25, p. 356)
- **LaTeX**: SCons.Scanner.LaTeX
  This module implements the dependency scanner for LaTeX code.
  (Section 26, p. 357)
- **Prog** *(Section 27, p. 364)*
- **RC**: SCons.Scanner.RC
  This module implements the depenency scanner for RC (Interface Definition Language) files.
  (Section 28, p. 365)

20.2 Functions

Scanner(*function*, **args*, ***kw*)

```
Public interface factory function for creating different types
of Scanners based on the different types of "functions" that may
be supplied.

TODO:  Deprecate this some day.  We've moved the functionality
inside the Base class and really don't need this factory function
any more.  It was, however, used by some of our Tool modules, so
the call probably ended up in various people's custom modules
patterned on SCons code.
```

20.3 Variables

Name	Description
__revision__	**Value:** `'src/engine/SCons/Scanner/__init__.py 5023 2010/06/14 22:...`

continued on next page

Name	Description

20.4 Class FindPathDirs

object
└ **SCons.Scanner.FindPathDirs**

```
A class to bind a specific *PATH variable name to a function that
will return all of the *path directories.
```

20.4.1 Methods

__init__(*self*, *variable*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

__call__(*self*, *env*, *dir*=`False`, *target*=`False`, *source*=`False`, *argument*=`False`)

__delattr__(*...*)
`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)
`x.__getattribute__('name') <==> x.name`

__hash__(*x*)
`hash(x)`

__new__(*T*, *S*, *...*)

Return Value
`a new object with type S, a subtype of T`

__reduce__(*...*)
`helper for pickle`

__reduce_ex__(*...*)
`helper for pickle`

__repr__(*x*)
`repr(x)`

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

20.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

20.5 Class Base

object
└
SCons.Scanner.Base

Known Subclasses: SCons.Scanner.Current, SCons.Scanner.Selector, SCons.Scanner.LaTeX.LaTeX

```
The base class for dependency scanners.  This implements
straightforward, single-pass scanning of a single file.
```

20.5.1 Methods

__call__(*self*, *node*, *env*, *path*=())

```
This method scans a single object. 'node' is the node
that will be passed to the scanner function, and 'env' is the
environment that will be passed to the scanner function. A list of
direct dependency nodes for the specified node will be returned.
```

__cmp__(*self*, *other*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*self*)
`hash(x)`

Overrides: object.__hash__ extit(inherited documentation)

__**init**__(*self*, *function*, *name*='NONE', *argument*=<class 'SCons.Scanner._Null'>, *skeys*=<class 'SCons.Scanner._Null'>, *path_function*=False, *node_class*=<class 'SCons.Node.FS.Base'>, *node_factory*=False, *scan_check*=False, *recursive*=False)

```
Construct a new scanner object given a scanner function.

'function' - a scanner function taking two or three
arguments and returning a list of strings.

'name' - a name for identifying this scanner object.

'argument' - an optional argument that, if specified, will be
passed to both the scanner function and the path_function.

'skeys' - an optional list argument that can be used to determine
which scanner should be used for a given Node. In the case of File
nodes, for example, the 'skeys' would be file suffixes.

'path_function' - a function that takes four or five arguments
(a construction environment, Node for the directory containing
the SConscript file that defined the primary target, list of
target nodes, list of source nodes, and optional argument for
this instance) and returns a tuple of the directories that can
be searched for implicit dependency files.  May also return a
callable() which is called with no args and returns the tuple
(supporting Bindable class).

'node_class' - the class of Nodes which this scan will return.
If node_class is None, then this scanner will not enforce any
Node conversion and will return the raw results from the
underlying scanner function.

'node_factory' - the factory function to be called to translate
the raw results returned by the scanner function into the
expected node_class objects.

'scan_check' - a function to be called to first check whether
this node really needs to be scanned.

'recursive' - specifies that this scanner should be invoked
recursively on all of the implicit dependencies it returns
(the canonical example being #include lines in C source files).
May be a callable, which will be called to filter the list
of nodes found to select a subset for recursive scanning
(the canonical example being only recursively scanning
subdirectories within a directory).

The scanner function's first argument will be a Node that should
be scanned for dependencies, the second argument will be an
Environment object, the third argument will be the tuple of paths
returned by the path_function, and the fourth argument will be
the value passed into 'argument', and the returned list should
contain the Nodes for all the direct dependencies of the file.
```



```
Examples:

s = Scanner(my_scanner_function)
```

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__**reduce**__(*...*)

```
helper for pickle
```

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__**str**__(*self*)

```
str(x)
```

Overrides: object.__str__ extit(inherited documentation)

add_scanner(*self*, *skey*, *scanner*)

add_skey(*self*, *skey*)

```
Add a skey to the list of skeys
```

get_skeys(*self*, *env*=`False`)

path(*self*, *env*, *dir*=`False`, *target*=`False`, *source*=`False`)

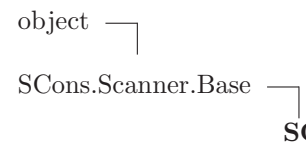
recurse_nodes(*self*, *nodes*)

select(*self*, *node*)

20.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

20.6 Class Selector




```
A class for selecting a more specific scanner based on the
scanner_key() (suffix) for a specific Node.

TODO:  This functionality has been moved into the inner workings of
the Base class, and this class will be deprecated at some point.
(It was never exposed directly as part of the public interface,
although it is used by the Scanner() factory function that was
used by various Tool modules and therefore was likely a template
for custom modules that may be out there.)
```

20.6.1 Methods

__init__(*self*, *dict*, **args*, ***kw*)

```
Construct a new scanner object given a scanner function.

'function' - a scanner function taking two or three
arguments and returning a list of strings.

'name' - a name for identifying this scanner object.

'argument' - an optional argument that, if specified, will be
passed to both the scanner function and the path_function.

'skeys' - an optional list argument that can be used to determine
which scanner should be used for a given Node. In the case of File
nodes, for example, the 'skeys' would be file suffixes.

'path_function' - a function that takes four or five arguments
(a construction environment, Node for the directory containing
the SConscript file that defined the primary target, list of
target nodes, list of source nodes, and optional argument for
this instance) and returns a tuple of the directories that can
be searched for implicit dependency files.  May also return a
callable() which is called with no args and returns the tuple
(supporting Bindable class).

'node_class' - the class of Nodes which this scan will return.
If node_class is None, then this scanner will not enforce any
Node conversion and will return the raw results from the
underlying scanner function.

'node_factory' - the factory function to be called to translate
the raw results returned by the scanner function into the
expected node_class objects.

'scan_check' - a function to be called to first check whether
this node really needs to be scanned.

'recursive' - specifies that this scanner should be invoked
recursively on all of the implicit dependencies it returns
(the canonical example being #include lines in C source files).
May be a callable, which will be called to filter the list
of nodes found to select a subset for recursive scanning
(the canonical example being only recursively scanning
subdirectories within a directory).

The scanner function's first argument will be a Node that should
be scanned for dependencies, the second argument will be an
Environment object, the third argument will be the tuple of paths
returned by the path_function, and the fourth argument will be
the value passed into 'argument', and the returned list should
contain the Nodes for all the direct dependencies of the file.
```



```
Examples:

s = Scanner(my_scanner_function)

s = Scanner(function = my_scanner_function)
```

__call__(*self*, *node*, *env*, *path*=())

```
This method scans a single object. 'node' is the node
that will be passed to the scanner function, and 'env' is the
environment that will be passed to the scanner function. A list of
direct dependency nodes for the specified node will be returned.
```

Overrides: SCons.Scanner.Base.__call__ extit(inherited documentation)

select(*self*, *node*)
Overrides: SCons.Scanner.Base.select

add_scanner(*self*, *skey*, *scanner*)
Overrides: SCons.Scanner.Base.add_scanner

__cmp__(*self*, *other*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*self*)
`hash(x)`

Overrides: object.__hash__ extit(inherited documentation)

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

add_skey(*self*, *skey*)

`Add a skey to the list of skeys`

get_skeys(*self*, *env*=`False`)

path(*self*, *env*, *dir*=`False`, *target*=`False`, *source*=`False`)

recurse_nodes(*self*, *nodes*)

20.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

20.7 Class Current

object
SCons.Scanner.Base
SCons.Scanner.Current

Known Subclasses: SCons.Scanner.Classic

```
A class for scanning files that are source files (have no builder)
or are derived files and are current (which implies that they exist,
either locally or in a repository).
```

20.7.1 Methods

__init__(*self*, **args*, ***kw*)

```
Construct a new scanner object given a scanner function.

'function' - a scanner function taking two or three
arguments and returning a list of strings.

'name' - a name for identifying this scanner object.

'argument' - an optional argument that, if specified, will be
passed to both the scanner function and the path_function.

'skeys' - an optional list argument that can be used to determine
which scanner should be used for a given Node. In the case of File
nodes, for example, the 'skeys' would be file suffixes.

'path_function' - a function that takes four or five arguments
(a construction environment, Node for the directory containing
the SConscript file that defined the primary target, list of
target nodes, list of source nodes, and optional argument for
this instance) and returns a tuple of the directories that can
be searched for implicit dependency files.  May also return a
callable() which is called with no args and returns the tuple
(supporting Bindable class).

'node_class' - the class of Nodes which this scan will return.
If node_class is None, then this scanner will not enforce any
Node conversion and will return the raw results from the
underlying scanner function.

'node_factory' - the factory function to be called to translate
the raw results returned by the scanner function into the
expected node_class objects.

'scan_check' - a function to be called to first check whether
this node really needs to be scanned.

'recursive' - specifies that this scanner should be invoked
recursively on all of the implicit dependencies it returns
(the canonical example being #include lines in C source files).
May be a callable, which will be called to filter the list
of nodes found to select a subset for recursive scanning
(the canonical example being only recursively scanning
subdirectories within a directory).

The scanner function's first argument will be a Node that should
be scanned for dependencies, the second argument will be an
Environment object, the third argument will be the tuple of paths
returned by the path_function, and the fourth argument will be
the value passed into 'argument', and the returned list should
contain the Nodes for all the direct dependencies of the file.
```



```
Examples:

s = Scanner(my_scanner_function)

s = Scanner(function = my_scanner_function)
```

__call__(*self*, *node*, *env*, *path*=())

```
This method scans a single object. 'node' is the node
that will be passed to the scanner function, and 'env' is the
environment that will be passed to the scanner function. A list of
direct dependency nodes for the specified node will be returned.
```

__cmp__(*self*, *other*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*self*)

```
hash(x)
```

Overrides: object.__hash__ extit(inherited documentation)

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*self*)

```
str(x)
```

Overrides: object.__str__ extit(inherited documentation)

add_scanner(*self*, *skey*, *scanner*)

add_skey(*self*, *skey*)

```
Add a skey to the list of skeys
```

get_skeys(*self*, *env*=False)

path(*self*, *env*, *dir*=False, *target*=False, *source*=False)

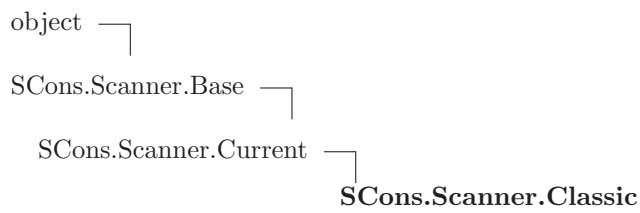
recurse_nodes(*self*, *nodes*)

select(*self*, *node*)

20.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

20.8 Class Classic



Known Subclasses: SCons.Scanner.ClassicCPP, SCons.Scanner.D.D, SCons.Scanner.Fortran.F90Scanner

```
A Scanner subclass to contain the common logic for classic CPP-style
include scanning, but which can be customized to use different
regular expressions to find the includes.

Note that in order for this to work "out of the box" (without
overriding the find_include() and sort_key() methods), the regular
expression passed to the constructor must return the name of the
include file in group 0.
```

20.8.1 Methods

__**call**__(*self*, *node*, *env*, *path*=())

```
This method scans a single object. 'node' is the node
that will be passed to the scanner function, and 'env' is the
environment that will be passed to the scanner function. A list of
direct dependency nodes for the specified node will be returned.
```

__cmp__(*self*, *other*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*self*)

```
hash(x)
```

Overrides: object.__hash__ extit(inherited documentation)

__init__(*self*, *name*, *suffixes*, *path_variable*, *regex*, **args*, ***kw*)

Overrides: SCons.Scanner.Current.__init__

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*self*)

```
str(x)
```

Overrides: object.__str__ extit(inherited documentation)

add_scanner(*self*, *skey*, *scanner*)

add_skey(*self*, *skey*)

```
Add a skey to the list of skeys
```

find_include(*self*, *include*, *source_dir*, *path*)

find_include_names(*self*, *node*)

get_skeys(*self*, *env*=`False`)

path(*self*, *env*, *dir*=`False`, *target*=`False`, *source*=`False`)

recurse_nodes(*self*, *nodes*)

scan(*self*, *node*, *path*=`()`)

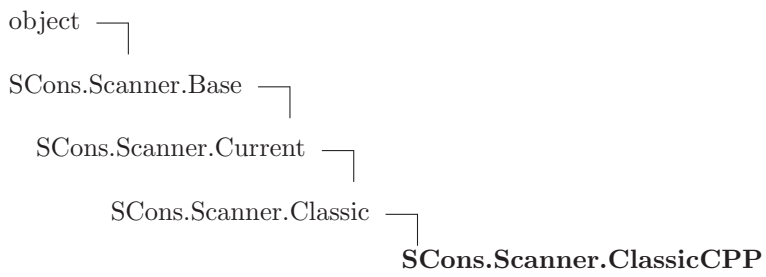
select(*self*, *node*)

sort_key(*self*, *include*)

20.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

20.9 Class ClassicCPP




```
A Classic Scanner subclass which takes into account the type of
bracketing used to include the file, and uses classic CPP rules
for searching for the files based on the bracketing.

Note that in order for this to work, the regular expression passed
to the constructor must return the leading bracket in group 0, and
the contained filename in group 1.
```

20.9.1 Methods

find_include(*self*, *include*, *source_dir*, *path*)
Overrides: SCons.Scanner.Classic.find_include

sort_key(*self*, *include*)
Overrides: SCons.Scanner.Classic.sort_key

__call__(*self*, *node*, *env*, *path*=())

```
This method scans a single object. 'node' is the node
that will be passed to the scanner function, and 'env' is the
environment that will be passed to the scanner function. A list of
direct dependency nodes for the specified node will be returned.
```

__cmp__(*self*, *other*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*self*)
`hash(x)`

Overrides: object.__hash__ extit(inherited documentation)

__init__(*self*, *name*, *suffixes*, *path_variable*, *regex*, **args*, ***kw*)
Overrides: SCons.Scanner.Current.__init__

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

add_scanner(*self*, *skey*, *scanner*)

add_skey(*self*, *skey*)

Add a skey to the list of skeys

find_include_names(*self*, *node*)

get_skeys(*self*, *env*=False)

path(*self*, *env*, *dir*=False, *target*=False, *source*=False)

recurse_nodes(*self*, *nodes*)

scan(*self*, *node*, *path*=())

select(*self*, *node*)

20.9.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

21 Module SCons.Scanner.C

```
SCons.Scanner.C

This module implements the depenency scanner for C/C++ code.
```

21.1 Functions

dictify_CPPDEFINES(*env*)

CScanner()

```
Return a prototype Scanner instance for scanning source files
that use the C pre-processor
```

21.2 Variables

Name	Description
__revision__	**Value:** `'src/engine/SCons/Scanner/C.py 5023 2010/06/14 22:05:46 s...`

21.3 Class SConsCPPScanner

object

SCons.cpp.PreProcessor

SCons.Scanner.C.SConsCPPScanner

```
SCons-specific subclass of the cpp.py module's processing.

We subclass this so that: 1) we can deal with files represented
by Nodes, not strings; 2) we can keep track of the files that are
missing.
```

21.3.1 Methods

__init__(*self*, **args*, ***kw*)
Overrides: SCons.cpp.PreProcessor.__init__

initialize_result(*self*, *fname*)
Overrides: SCons.cpp.PreProcessor.initialize_result

finalize_result(*self*, *fname*)
Overrides: SCons.cpp.PreProcessor.finalize_result

find_include_file(*self*, *t*)

```
Finds the #include file for a given preprocessor tuple.
```

Overrides: SCons.cpp.PreProcessor.find_include_file extit(inherited documentation)

read_file(*self*, *file*)
Overrides: SCons.cpp.PreProcessor.read_file

__call__(*self*, *file*)

```
Pre-processes a file.

This is the main public entry point.
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

all_include(*self*, *t*)

do_define(*self*, *t*)

```
Default handling of a #define line.
```

do_elif(*self*, *t*)

```
Default handling of a #elif line.
```

do_else(*self*, *t*)

```
Default handling of a #else line.
```

do_endif(*self*, *t*)

```
Default handling of a #endif line.
```

do_if(*self*, *t*)

```
Default handling of a #if line.
```

do_ifdef(*self*, *t*)

```
Default handling of a #ifdef line.
```

do_ifndef(*self*, *t*)

```
Default handling of a #ifndef line.
```

do_import(*self*, *t*)

```
Default handling of a #import line.
```

do_include(*self*, *t*)

```
Default handling of a #include line.
```

do_include_next(*self*, *t*)

```
Default handling of a #include line.
```

do_nothing(*self*, *t*)

```
Null method for when we explicitly want the action for a
specific preprocessor directive to do nothing.
```

do_undef(*self*, *t*)

```
Default handling of a #undef line.
```

eval_expression(*self*, *t*)

```
Evaluates a C preprocessor expression.

This is done by converting it to a Python equivalent and
eval()ing it in the C preprocessor namespace we use to
track #define values.
```

process_contents(*self*, *contents*, *fname*=False)

```
Pre-processes a file contents.

This is the main internal entry point.
```

resolve_include(*self*, *t*)

```
Resolve a tuple-ized #include line.

This handles recursive expansion of values without "" or <>
surrounding the name until an initial " or < is found, to handle
        #include FILE
where FILE is a #define somewhere else.
```

restore(*self*)

```
Pops the previous dispatch table off the stack and makes it the
current one.
```

save(*self*)

```
Pushes the current dispatch table on the stack and re-initializes
the current dispatch table to the default.
```

scons_current_file(*self*, *t*)

start_handling_includes(*self*, *t*=False)

```
Causes the PreProcessor object to start processing #import,
#include and #include_next lines.

This method will be called when a #if, #ifdef, #ifndef or #elif
evaluates True, or when we reach the #else in a #if, #ifdef,
#ifndef or #elif block where a condition already evaluated
False.
```

stop_handling_includes(*self*, *t*=False)

```
Causes the PreProcessor object to stop processing #import,
#include and #include_next lines.

This method will be called when a #if, #ifdef, #ifndef or #elif
evaluates False, or when we reach the #else in a #if, #ifdef,
#ifndef or #elif block where a condition already evaluated True.
```

tupleize(*self*, *contents*)

```
Turns the contents of a file into a list of easily-processed
tuples describing the CPP lines in the file.

The first element of each tuple is the line's preprocessor
directive (#if, #include, #define, etc., minus the initial '#').
The remaining elements are specific to the type of directive, as
pulled apart by the regular expression.
```

21.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

21.4 Class SConsCPPScannerWrapper

object
└ **SCons.Scanner.C.SConsCPPScannerWrapper**

```
The SCons wrapper around a cpp.py scanner.

This is the actual glue between the calling conventions of generic
SCons scanners, and the (subclass of) cpp.py class that knows how
to look for #include lines with reasonably real C-preprocessor-like
evaluation of #if/#ifdef/#else/#elif lines.
```

21.4.1 Methods

__init__(*self*, *name*, *variable*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

__call__(*self*, *node*, *env*, *path*=`()`)

recurse_nodes(*self*, *nodes*)

select(*self*, *node*)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__new__(*T*, *S*, *...*)

Return Value
`a new object with type S, a subtype of T`

__reduce__(*...*)

`helper for pickle`

__reduce_ex__(*...*)

`helper for pickle`

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

21.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

22 Module SCons.Scanner.D

```
SCons.Scanner.D

Scanner for the Digital Mars "D" programming language.

Coded by Andy Friesen
17 Nov 2003
```

22.1 Functions

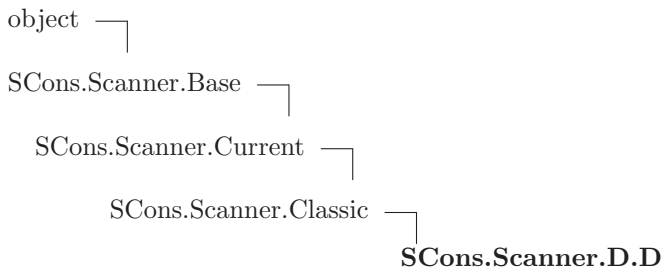
DScanner()

```
Return a prototype Scanner instance for scanning D source files
```

22.2 Variables

Name	Description
__revision__	**Value:** `'src/engine/SCons/Scanner/D.py 5023 2010/06/14 22:05:46 s...`

22.3 Class D



22.3.1 Methods

__init__(*self*)
Overrides: SCons.Scanner.Classic.__init__

find_include(*self*, *include*, *source_dir*, *path*)
Overrides: SCons.Scanner.Classic.find_include

find_include_names(*self*, *node*)
Overrides: SCons.Scanner.Classic.find_include_names

__call__(*self*, *node*, *env*, *path*=())

```
This method scans a single object. 'node' is the node
that will be passed to the scanner function, and 'env' is the
environment that will be passed to the scanner function. A list of
direct dependency nodes for the specified node will be returned.
```

__cmp__(*self*, *other*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*self*)
`hash(x)`

Overrides: object.__hash__ extit(inherited documentation)

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

add_scanner(*self*, *skey*, *scanner*)

add_skey(*self*, *skey*)

Add a skey to the list of skeys

get_skeys(*self*, *env*=False)

path(*self*, *env*, *dir*=False, *target*=False, *source*=False)

recurse_nodes(*self*, *nodes*)

scan(*self*, *node*, *path*=())

select(*self*, *node*)

sort_key(*self*, *include*)

22.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

23 Module SCons.Scanner.Dir

23.1 Functions

only_dirs(*nodes*)

DirScanner(***kw*)

```
Return a prototype Scanner instance for scanning
directories for on-disk files
```

DirEntryScanner(***kw*)

```
Return a prototype Scanner instance for "scanning"
directory Nodes for their in-memory entries
```

do_not_scan(*k*)

scan_on_disk(*node*, *env*, *path*=())

```
Scans a directory for on-disk files and directories therein.

Looking up the entries will add these to the in-memory Node tree
representation of the file system, so all we have to do is just
that and then call the in-memory scanning function.
```

scan_in_memory(*node*, *env*, *path*=())

```
"Scans" a Node.FS.Dir for its in-memory entries.
```

23.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Scanner/Dir.py 5023 2010/06/14 22:05:46...
skip_entry	**Value:** {'.': 1, '..': 1, '.sconsign': 1, '.sconsign.bak': 1, '.s...
skip_entry_list	**Value:** ['.', '..', '.sconsign', '.sconsign.dblite', '.sconsign.d...
skip	**Value:** '.sconsign.db'

24 Module SCons.Scanner.Fortran

SCons.Scanner.Fortran

This module implements the dependency scanner for Fortran code.

24.1 Functions

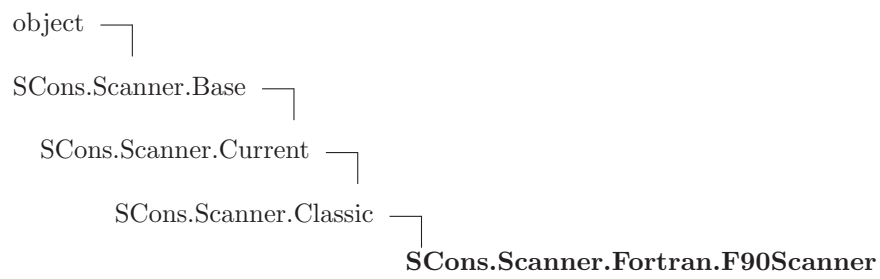
FortranScan(*path_variable*='FORTRANPATH')

Return a prototype Scanner instance for scanning source files
for Fortran USE & INCLUDE statements

24.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Scanner/Fortran.py 5023 2010/06/14 22:0...

24.3 Class F90Scanner



A Classic Scanner subclass for Fortran source files which takes
into account both USE and INCLUDE statements. This scanner will
work for both F77 and F90 (and beyond) compilers.

Currently, this scanner assumes that the include files do not contain
USE statements. To enable the ability to deal with USE statements
in include files, add logic right after the module names are found
to loop over each include file, search for and locate each USE
statement, and append each module name to the list of dependencies.
Caching the search results in a common dictionary somewhere so that
the same include file is not searched multiple times would be a
smart thing to do.

24.3.1 Methods

__**init**__(*self*, *name*, *suffixes*, *path_variable*, *use_regex*, *incl_regex*, *def_regex*, **args*, ***kw*)
Overrides: SCons.Scanner.Classic.__init__

scan(*self*, *node*, *env*, *path*=())
Overrides: SCons.Scanner.Classic.scan

__call__(*self*, *node*, *env*, *path*=())

```
This method scans a single object. 'node' is the node
that will be passed to the scanner function, and 'env' is the
environment that will be passed to the scanner function. A list of
direct dependency nodes for the specified node will be returned.
```

__cmp__(*self*, *other*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*self*)
`hash(x)`

Overrides: object.__hash__ extit(inherited documentation)

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

add_scanner(*self*, *skey*, *scanner*)

add_skey(*self*, *skey*)

Add a skey to the list of skeys

find_include(*self*, *include*, *source_dir*, *path*)

find_include_names(*self*, *node*)

get_skeys(*self*, *env*=False)

path(*self*, *env*, *dir*=False, *target*=False, *source*=False)

recurse_nodes(*self*, *nodes*)

select(*self*, *node*)

sort_key(*self*, *include*)

24.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

25 Module SCons.Scanner.IDL

```
SCons.Scanner.IDL

This module implements the depenency scanner for IDL (Interface
Definition Language) files.
```

25.1 Functions

IDLScan()

```
Return a prototype Scanner instance for scanning IDL source files
```

25.2 Variables

Name	Description
__revision__	**Value:** `'src/engine/SCons/Scanner/IDL.py 5023 2010/06/14 22:05:46...`

26 Module SCons.Scanner.LaTeX

SCons.Scanner.LaTeX

This module implements the dependency scanner for LaTeX code.

26.1 Functions

modify_env_var(*env*, *var*, *abspath*)

LaTeXScanner()

Return a prototype Scanner instance for scanning LaTeX source files
when built with latex.

PDFLaTeXScanner()

Return a prototype Scanner instance for scanning LaTeX source files
when built with pdflatex.

26.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Scanner/LaTeX.py 5023 2010/06/14 22:05:...
TexGraphics	**Value:** ['.eps', '.ps']
LatexGraphics	**Value:** ['.pdf', '.png', '.jpg', '.gif', '.tif']

26.3 Class FindENVPathDirs

object
└ **SCons.Scanner.LaTeX.FindENVPathDirs**

A class to bind a specific *PATH variable name to a function that
will return all of the *path directories.

26.3.1 Methods

__init__(*self*, *variable*)
x.__init__(...) initializes x; see x.__class__.__doc__ for signature

Overrides: object.__init__ extit(inherited documentation)

__call__(*self*, *env*, *dir*=False, *target*=False, *source*=False, *argument*=False)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

26.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

26.4 Class LaTeX

object

SCons.Scanner.Base

SCons.Scanner.LaTeX.LaTeX

```
Class for scanning LaTeX files for included files.

Unlike most scanners, which use regular expressions that just
return the included file name, this returns a tuple consisting
of the keyword for the inclusion ("include", "includegraphics",
"input", or "bibliography"), and then the file name itself.
Based on a quick look at LaTeX documentation, it seems that we
should append .tex suffix for the "include" keywords, append .tex if
there is no extension for the "input" keyword, and need to add .bib
for the "bibliography" keyword that does not accept extensions by itself.

Finally, if there is no extension for an "includegraphics" keyword
latex will append .ps or .eps to find the file, while pdftex may use .pdf,
.jpg, .tif, .mps, or .png.

The actual subset and search order may be altered by
DeclareGraphicsExtensions command. This complication is ignored.
The default order corresponds to experimentation with teTeX
    $ latex --version
    pdfeTeX 3.141592-1.21a-2.2 (Web2C 7.5.4)
    kpathsea version 3.5.4
The order is:
    ['.eps', '.ps'] for latex
    ['.png', '.pdf', '.jpg', '.tif'].

Another difference is that the search path is determined by the type
of the file being searched:
env['TEXINPUTS'] for "input" and "include" keywords
env['TEXINPUTS'] for "includegraphics" keyword
env['TEXINPUTS'] for "lstinputlisting" keyword
env['BIBINPUTS'] for "bibliography" keyword
env['BSTINPUTS'] for "bibliographystyle" keyword

FIXME: also look for the class or style in document[class|style]{}
FIXME: also look for the argument of bibliographystyle{}
```

26.4.1 Methods

__**init**__(*self*, *name*, *suffixes*, *graphics_extensions*, **args*, ***kw*)

```
Construct a new scanner object given a scanner function.

'function' - a scanner function taking two or three
arguments and returning a list of strings.

'name' - a name for identifying this scanner object.

'argument' - an optional argument that, if specified, will be
passed to both the scanner function and the path_function.

'skeys' - an optional list argument that can be used to determine
which scanner should be used for a given Node. In the case of File
nodes, for example, the 'skeys' would be file suffixes.

'path_function' - a function that takes four or five arguments
(a construction environment, Node for the directory containing
the SConscript file that defined the primary target, list of
target nodes, list of source nodes, and optional argument for
this instance) and returns a tuple of the directories that can
be searched for implicit dependency files.  May also return a
callable() which is called with no args and returns the tuple
(supporting Bindable class).

'node_class' - the class of Nodes which this scan will return.
If node_class is None, then this scanner will not enforce any
Node conversion and will return the raw results from the
underlying scanner function.

'node_factory' - the factory function to be called to translate
the raw results returned by the scanner function into the
expected node_class objects.

'scan_check' - a function to be called to first check whether
this node really needs to be scanned.

'recursive' - specifies that this scanner should be invoked
recursively on all of the implicit dependencies it returns
(the canonical example being #include lines in C source files).
May be a callable, which will be called to filter the list
of nodes found to select a subset for recursive scanning
(the canonical example being only recursively scanning
subdirectories within a directory).

The scanner function's first argument will be a Node that should
be scanned for dependencies, the second argument will be an
Environment object, the third argument will be the tuple of paths
returned by the path_function, and the fourth argument will be
the value passed into 'argument', and the returned list should
contain the Nodes for all the direct dependencies of the file.
```



```
Examples:

s = Scanner(my_scanner_function)

s = Scanner(function = my_scanner_function)
```

sort_key(*self*, *include*)

find_include(*self*, *include*, *source_dir*, *path*)

scan(*self*, *node*)

scan_recurse(*self*, *node*, *path*=())

```
do a recursive scan of the top level target file
This lets us search for included files based on the
directory of the main file just as latex does
```

__**call**__(*self*, *node*, *env*, *path*=())

```
This method scans a single object. 'node' is the node
that will be passed to the scanner function, and 'env' is the
environment that will be passed to the scanner function. A list of
direct dependency nodes for the specified node will be returned.
```

__**cmp**__(*self*, *other*)

__**delattr**__(...)

```
x.__delattr__('name') <==> del x.name
```

__**getattribute**__(...)

```
x.__getattribute__('name') <==> x.name
```

__**hash**__(*self*)

```
hash(x)
```

Overrides: object.__hash__ extit(inherited documentation)

__**new**__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__**reduce**__(...)

```
helper for pickle
```

__**reduce_ex**__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*self*)

```
str(x)
```

Overrides: object.__str__ extit(inherited documentation)

add_scanner(*self*, *skey*, *scanner*)

add_skey(*self*, *skey*)

```
Add a skey to the list of skeys
```

get_skeys(*self*, *env*=`False`)

path(*self*, *env*, *dir*=`False`, *target*=`False`, *source*=`False`)

recurse_nodes(*self*, *nodes*)

select(*self*, *node*)

26.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

26.4.3 Class Variables

Name	Description
keyword_paths	**Value:** {'bibliography': 'BIBINPUTS', 'bibliographystyle': 'BSTIN...
env_variables	**Value:** ['BIBINPUTS', 'TEXINPUTS', 'BSTINPUTS']

27 Module SCons.Scanner.Prog

27.1 Functions

ProgramScanner(***kw*)

```
Return a prototype Scanner instance for scanning executable
files for static-lib dependencies
```

scan(*node*, *env*, *libpath*=())

```
This scanner scans program files for static-library
dependencies.  It will search the LIBPATH environment variable
for libraries specified in the LIBS variable, returning any
files it finds as dependencies.
```

27.2 Variables

Name	Description
__revision__	**Value:** `'src/engine/SCons/Scanner/Prog.py 5023 2010/06/14 22:05:4...`
print_find_libs	**Value:** `False`

28 Module SCons.Scanner.RC

SCons.Scanner.RC

This module implements the depenency scanner for RC (Interface Definition Language) files.

28.1 Functions

RCScan()

Return a prototype Scanner instance for scanning RC source files

28.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Scanner/RC.py 5023 2010/06/14 22:05:46 ...

29 Package SCons.Script

```
SCons.Script

This file implements the main() function used by the scons script.

Architecturally, this *is* the scons script, and will likely only be
called from the external "scons" wrapper.  Consequently, anything here
should not be, or be considered, part of the build engine.  If it's
something that we expect other software to want to use, it should go in
some other module.  If it's specific to the "scons" script invocation,
it goes here.
```

29.1 Modules

- **Interactive**: SCons interactive mode
  (Section 30, p. 373)
- **Main**: SCons.Script
  This file implements the main() function used by the scons script.
  (Section 31, p. 377)
- **SConscript'**: SCons.Script.SConscript
  This module defines the Python API provided to SConscript and SConstruct files.
  (Section 32, p. 404)

29.2 Functions

HelpFunction(*text*)

Variables(*files*=[], *args*={})

Options(*files*=[], *args*={})

29.3 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Script/__init__.py 5023 2010/06/14 22:0...
start_time	**Value:** 1276578478.69
call_stack	**Value:** []
PathVariable	**Value:** <SCons.Variables.PathVariable._PathVariableClass object a...
PathOption	**Value:** <SCons.Options.PathOption._PathOptionClass object at 0x8b...
Chmod	**Value:** ActionFactory(chmod_func, chmod_strfunc)
Copy	**Value:** ActionFactory(copy_func, lambda dest, src: 'Copy("%s", "%...
Delete	**Value:** ActionFactory(delete_func, delete_strfunc)

continued on next page

Name	Description
Mkdir	**Value:** `ActionFactory(mkdir_func, lambda dir: 'Mkdir(%s)' % get_p...`
Move	**Value:** `ActionFactory(move_func, lambda dest, src: 'Move("%s", "%...`
Touch	**Value:** `ActionFactory(touch_func, lambda file: 'Touch(%s)' % get_...`
CScanner	**Value:** `SCons.Tool.CScanner`
DScanner	**Value:** `SCons.Tool.DScanner`
DirScanner	**Value:** `SCons.Scanner.Dir.DirScanner()`
ProgramScanner	**Value:** `SCons.Tool.ProgramScanner`
SourceFileScanner	**Value:** `SCons.Tool.SourceFileScanner`
CScan	**Value:** `SCons.Tool.CScanner`
ARGUMENTS	**Value:** {}
ARGLIST	**Value:** `[]`
BUILD_TARGETS	**Value:** `[]`
COMMAND_LINE_TARGETS	**Value:** `[]`
DEFAULT_TARGETS	**Value:** `[]`
help_text	**Value:** `False`
sconscript_reading	**Value:** `0`
GlobalDefaultEnvironmentFunctions	**Value:** `['Default', 'EnsurePythonVersion', 'EnsureSConsVersion', ...`
GlobalDefaultBuilders	**Value:** `['CFile', 'CXXFile', 'DVI', 'Jar', 'Java', 'JavaH', 'Libr...`
SConscript	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`
Command	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`
AddPostAction	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`
AddPreAction	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`
Alias	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`
AlwaysBuild	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`
BuildDir	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`
CFile	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`
CXXFile	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`
CacheDir	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`
Clean	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`
DVI	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`
Decider	**Value:** `<SCons.Script.SConscript.DefaultEnvironmentCall object at...`

continued on next page

Name	Description
Default	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Depends	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Dir	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
EnsurePythonVersion	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
EnsureSConsVersion	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Entry	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Execute	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Exit	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Export	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
File	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
FindFile	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
FindInstalledFiles	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
FindSourceFiles	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Flatten	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
GetBuildPath	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
GetLaunchDir	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Glob	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Help	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Ignore	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Import	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Install	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
InstallAs	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Jar	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Java	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
JavaH	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...

continued on next page

Name	Description
Library	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Literal	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Local	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
M4	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
MSVSProject	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
NoCache	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
NoClean	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Object	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
PCH	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
PDF	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Package	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
ParseDepends	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
PostScript	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Precious	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Program	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
RES	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
RMIC	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Repository	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Requires	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
SConscriptChdir	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
SConsignFile	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
SharedLibrary	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
SharedObject	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
SideEffect	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
SourceCode	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...

continued on next page

Name	Description
SourceSignatures	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Split	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
StaticLibrary	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
StaticObject	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Tag	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Tar	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
TargetSignatures	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
TypeLibrary	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Value	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
VariantDir	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...
Zip	**Value:** <SCons.Script.SConscript.DefaultEnvironmentCall object at...

29.4 Class TargetList

UserList.UserList
└ **SCons.Script.TargetList**

29.4.1 Methods

__add__(*self*, *other*)

__cmp__(*self*, *other*)

__contains__(*self*, *item*)

__delitem__(*self*, *i*)

__delslice__(*self*, *i*, *j*)

__eq__(*self*, *other*)

__ge__(*self*, *other*)

__getitem__(*self*, *i*)

__**getslice**__(*self*, *i*, *j*)

__**gt**__(*self*, *other*)

__**iadd**__(*self*, *other*)

__**imul**__(*self*, *n*)

__**init**__(*self*, *initlist*=`False`)

__**le**__(*self*, *other*)

__**len**__(*self*)

__**lt**__(*self*, *other*)

__**mul**__(*self*, *n*)

__**ne**__(*self*, *other*)

__**radd**__(*self*, *other*)

__**repr**__(*self*)

__**rmul**__(*self*, *n*)

__**setitem**__(*self*, *i*, *item*)

__**setslice**__(*self*, *i*, *j*, *other*)

append(*self*, *item*)

count(*self*, *item*)

extend(*self*, *other*)

index(*self*, *item*, **args*)

insert(*self*, *i*, *item*)

pop(*self*, *i*=`-1`)

remove(*self*, *item*)

reverse(*self*)

sort(*self*, **args*, ***kwds*)

30 Module SCons.Script.Interactive

SCons interactive mode

30.1 Functions

interact(*fs*, *parser*, *options*, *targets*, *target_top*)

30.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Script/Interactive.py 5023 2010/06/14 2...
__doc__	**Value:** ...

30.3 Class SConsInteractiveCmd

cmd.Cmd
└ **SCons.Script.Interactive.SConsInteractiveCmd**

```
build [TARGETS]         Build the specified TARGETS and their dependencies.
                        'b' is a synonym.
clean [TARGETS]         Clean (remove) the specified TARGETS and their
                        dependencies.  'c' is a synonym.
exit                    Exit SCons interactive mode.
help [COMMAND]          Prints help for the specified COMMAND.  'h' and
                        '?' are synonyms.
shell [COMMANDLINE]     Execute COMMANDLINE in a subshell.  'sh' and '!'
                        are synonyms.
version                 Prints SCons version information.
```

30.3.1 Methods

__**init**__(*self*, ***kw*)

```
Instantiate a line-oriented interpreter framework.

The optional argument 'completekey' is the readline name of a
completion key; it defaults to the Tab key. If completekey is
not None and the readline module is available, command completion
is done automatically. The optional arguments stdin and stdout
specify alternate input and output file objects; if not specified,
sys.stdin and sys.stdout are used.
```

Overrides: cmd.Cmd.__init__ extit(inherited documentation)

default(*self*, *argv*)
Called on an input line when the command prefix is not recognized.

If this method is not overridden, it prints an error message and returns.

Overrides: cmd.Cmd.default extit(inherited documentation)

onecmd(*self*, *line*)
Interpret the argument as though it had been typed in response to the prompt.

This may be overridden, but should not normally need to be; see the precmd() and postcmd() methods for useful execution hooks. The return value is a flag indicating whether interpretation of commands by the interpreter should stop.

Overrides: cmd.Cmd.onecmd extit(inherited documentation)

do_build(*self*, *argv*)

build [TARGETS] Build the specified TARGETS and their dependencies. 'b' is a synonym.

do_clean(*self*, *argv*)

clean [TARGETS] Clean (remove) the specified TARGETS and their dependencies. 'c' is a synonym.

do_EOF(*self*, *argv*)

do_exit(*self*, *argv*)

exit Exit SCons interactive mode.

do_help(*self*, *argv*)

help [COMMAND] Prints help for the specified COMMAND. 'h' and '?' are synonyms.

Overrides: cmd.Cmd.do_help

do_shell(*self*, *argv*)

shell [COMMANDLINE] Execute COMMANDLINE in a subshell. 'sh' and '!' are synonyms.

do_version(*self*, *argv*)

version Prints SCons version information.

cmdloop(*self*, *intro*=False)

```
Repeatedly issue a prompt, accept input, parse an initial prefix
off the received input, and dispatch to action methods, passing them
the remainder of the line as argument.
```

columnize(*self*, *list*, *displaywidth*=80)

```
Display a list of strings as a compact set of columns.

Each column is only as wide as necessary.
Columns are separated by two spaces (one was not legible enough).
```

complete(*self*, *text*, *state*)

```
Return the next possible completion for 'text'.

If a command has not been entered, then complete against command list.
Otherwise try to call complete_<command> to get list of completions.
```

complete_help(*self*, **args*)

completedefault(*self*, **ignored*)

```
Method called to complete an input line when no command-specific
complete_*() method is available.

By default, it returns an empty list.
```

completenames(*self*, *text*, **ignored*)

emptyline(*self*)

```
Called when an empty line is entered in response to the prompt.

If this method is not overridden, it repeats the last nonempty
command entered.
```

get_names(*self*)

parseline(*self*, *line*)

```
Parse the line into a command name and a string containing
the arguments.  Returns a tuple containing (command, args, line).
'command' and 'args' may be None if the line couldn't be parsed.
```

postcmd(*self*, *stop*, *line*)

```
Hook method executed just after a command dispatch is finished.
```

postloop(*self*)

```
Hook method executed once when the cmdloop() method is about to
return.
```

precmd(*self*, *line*)

```
Hook method executed just before the command line is
interpreted, but after the input prompt is generated and issued.
```

preloop(*self*)

```
Hook method executed once when the cmdloop() method is called.
```

print_topics(*self*, *header*, *cmds*, *cmdlen*, *maxcol*)

30.3.2 Class Variables

Name	Description
synonyms	**Value:** {'b': 'build', 'c': 'clean', 'h': 'help', 'scons': 'build...
doc_header	**Value:** 'Documented commands (type help <topic>):'
doc_leader	**Value:** ''
identchars	**Value:** 'abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123...
intro	**Value:** False
lastcmd	**Value:** ''
misc_header	**Value:** 'Miscellaneous help topics:'
nohelp	**Value:** '*** No help on %s'
prompt	**Value:** '(Cmd) '
ruler	**Value:** '='
undoc_header	**Value:** 'Undocumented commands:'
use_rawinput	**Value:** 1

31 Module SCons.Script.Main

```
SCons.Script

This file implements the main() function used by the scons script.

Architecturally, this *is* the scons script, and will likely only be
called from the external "scons" wrapper.  Consequently, anything here
should not be, or be considered, part of the build engine.  If it's
something that we expect other software to want to use, it should go in
some other module.  If it's specific to the "scons" script invocation,
it goes here.
```

31.1 Functions

fetch_win32_parallel_msg()

Progress(**args*, ***kw*)

GetBuildFailures()

python_version_string()

python_version_unsupported(*version*=(2, 5, 2, 'final', 0))

python_version_deprecated(*version*=(2, 5, 2, 'final', 0))

AddOption(**args*, ***kw*)

GetOption(*name*)

SetOption(*name*, *value*)

find_deepest_user_frame(*tb*)

```
Find the deepest stack frame that is not part of SCons.

Input is a "pre-processed" stack trace in the form
returned by traceback.extract_tb() or traceback.extract_stack()
```

version_string(*label*, *module*)

main()

31.2 Variables

Name	Description
unsupported_python_version	**Value:** `(2, 3, 0)`
deprecated_python_version	**Value:** `(2, 4, 0)`
__revision__	**Value:** `'src/engine/SCons/Script/Main.py 5023 2010/06/14 22:05:46...`
display	**Value:** `SCons.Util.display`
progress_display	**Value:** `SCons.Util.DisplayEngine()`
first_command_start	**Value:** `False`
last_command_end	**Value:** `False`
ProgressObject	**Value:** `Null(0x08BD80CC)`
print_objects	**Value:** `0`
print_memoizer	**Value:** `0`
print_stacktrace	**Value:** `0`
print_time	**Value:** `0`
sconscript_time	**Value:** `0`
cumulative_command_time	**Value:** `0`
exit_status	**Value:** `0`
this_build_status	**Value:** `0`
num_jobs	**Value:** `False`
delayed_warnings	**Value:** `[]`
OptionsParser	**Value:** `FakeOptionParser()`
count_stats	**Value:** `CountStats()`
memory_stats	**Value:** `MemStats()`

31.3 Class SConsPrintHelpException

object
exceptions.BaseException
exceptions.Exception
SCons.Script.Main.SConsPrintHelpException

31.3.1 Methods

__delattr__(...)

`x.__delattr__('name') <==> del x.name`

Overrides: object.__delattr__

__getattribute__(...)

`x.__getattribute__('name') <==> x.name`

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

`x[y]`

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

```
str(x)
```

Overrides: object.__str__

31.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

31.4 Class Progressor

object
└ **SCons.Script.Main.Progressor**

31.4.1 Methods

__init__(*self*, *obj*, *interval*=1, *file*=False, *overwrite*=False)
x.__init__(...) initializes x; see x.__class__.__doc__ for signature

Overrides: object.__init__ extit(inherited documentation)

write(*self*, *s*)

erase_previous(*self*)

spinner(*self*, *node*)

string(*self*, *node*)

replace_string(*self*, *node*)

__call__(*self*, *node*)

__delattr__(...)

x.__delattr__('name') <==> del x.name

__getattribute__(...)

x.__getattribute__('name') <==> x.name

__hash__(*x*)

hash(x)

__new__(*T*, *S*, ...)

Return Value

a new object with type S, a subtype of T

__reduce__(...)

helper for pickle

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

__str__(*x*)

str(x)

31.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

31.4.3 Class Variables

Name	Description
prev	**Value:** ''
count	**Value:** 0
target_string	**Value:** '$TARGET'

31.5 Class BuildTask

object

SCons.Taskmaster.Task

SCons.Taskmaster.OutOfDateTask

SCons.Script.Main.BuildTask

An SCons build task.

31.5.1 Methods

display(*self*, *message*)

```
Hook to allow the calling interface to display a message.

This hook gets called as part of preparing a task for execution
(that is, a Node to be built).  As part of figuring out what Node
should be built next, the actually target list may be altered,
along with a message describing the alteration.  The calling
interface can subclass Task and provide a concrete implementation
of this method to see those messages.
```

Overrides: SCons.Taskmaster.Task.display extit(inherited documentation)

prepare(*self*)

```
Called just before the task is executed.

This is mainly intended to give the target Nodes a chance to
unlink underlying files and make all necessary directories before
the Action is actually called to build the targets.
```

Overrides: SCons.Taskmaster.Task.prepare extit(inherited documentation)

needs_execute(*self*)

```
Returns True (indicating this Task should be executed) if this
Task's target state indicates it needs executing, which has
already been determined by an earlier up-to-date check.
```

Overrides: SCons.Taskmaster.OutOfDateTask.needs_execute extit(inherited documentation)

execute(*self*)

```
Called to execute the task.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here.  Do thread unsafe stuff in
prepare(), executed() or failed().
```

Overrides: SCons.Taskmaster.Task.execute extit(inherited documentation)

do_failed(*self*, *status*=2)

executed(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

Overrides: SCons.Taskmaster.Task.executed extit(inherited documentation)

failed(*self*)

```
Default action when a task fails:  stop the build.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

Overrides: SCons.Taskmaster.Task.failed extit(inherited documentation)

postprocess(*self*)

```
Post-processes a task after it's been executed.

This examines all the targets just built (or not, we don't care
if the build was successful, or even if there was no build
because everything was up-to-date) to see if they have any
waiting parent Nodes, or Nodes waiting on a common side effect,
that can be put back on the candidates list.
```

Overrides: SCons.Taskmaster.Task.postprocess extit(inherited documentation)

make_ready(*self*)

```
Make a task ready for execution
```

Overrides: SCons.Taskmaster.Task.make_ready

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__**init**__(*self*, *tm*, *targets*, *top*, *node*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__**new**__(*T*, *S*, *...*)

Return Value

`a new object with type S, a subtype of T`

__**reduce**__(*...*)

`helper for pickle`

__**reduce_ex**__(*...*)

`helper for pickle`

__**repr**__(*x*)

`repr(x)`

__**setattr**__(*...*)

`x.__setattr__('name', value) <==> x.name = value`

__**str**__(*x*)

`str(x)`

exc_clear(*self*)

```
Clears any recorded exception.

This also changes the "exception_raise" attribute to point
to the appropriate do-nothing method.
```

exc_info(*self*)

```
Returns info about a recorded exception.
```

exception_set(*self*, *exception*=`False`)

```
Records an exception to be raised at the appropriate time.

This also changes the "exception_raise" attribute to point
to the method that will, in fact
```

executed_with_callbacks(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

executed_without_callbacks(*self*)

```
Called when the task has been successfully executed
and the Taskmaster instance doesn't want to call
the Node's callback methods.
```

fail_continue(*self*)

```
Explicit continue-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

fail_stop(*self*)

```
Explicit stop-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

get_target(*self*)

```
Fetch the target being built or updated by this task.
```

make_ready_all(*self*)

```
Marks all targets in a task ready for execution.

This is used when the interface needs every target Node to be
visited--the canonical example being the "scons -c" option.
```

make_ready_current(*self*)

```
Marks all targets in a task ready for execution if any target
is not current.

This is the default behavior for building only what's necessary.
```

trace_message(*self*, *method*, *node*, *description*='node')

31.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

31.5.3 Class Variables

Name	Description
progress	**Value:** Null(0x08BD80CC)

31.6 Class CleanTask

object
SCons.Taskmaster.Task
SCons.Taskmaster.AlwaysTask
SCons.Script.Main.CleanTask

```
An SCons clean task.
```

31.6.1 Methods

fs_delete(*self*, *path*, *pathstr*, *remove*=1)

show(*self*)

remove(*self*)

```
Called to execute the task.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here.  Do thread unsafe stuff in
prepare(), executed() or failed().
```

execute(*self*)

```
Called to execute the task.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here.  Do thread unsafe stuff in
prepare(), executed() or failed().
```

Overrides: SCons.Taskmaster.Task.execute extit(inherited documentation)

executed(*self*)

```
Called when the task has been successfully executed
and the Taskmaster instance doesn't want to call
the Node's callback methods.
```

Overrides: SCons.Taskmaster.Task.executed

make_ready(*self*)

```
Marks all targets in a task ready for execution.

This is used when the interface needs every target Node to be
visited--the canonical example being the "scons -c" option.
```

Overrides: SCons.Taskmaster.Task.make_ready

prepare(*self*)

```
Called just before the task is executed.

This is mainly intended to give the target Nodes a chance to
unlink underlying files and make all necessary directories before
the Action is actually called to build the targets.
```

Overrides: SCons.Taskmaster.Task.prepare extit(inherited documentation)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *tm*, *targets*, *top*, *node*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

display(*self*, *message*)

```
Hook to allow the calling interface to display a message.

This hook gets called as part of preparing a task for execution
(that is, a Node to be built).  As part of figuring out what Node
should be built next, the actually target list may be altered,
along with a message describing the alteration.  The calling
interface can subclass Task and provide a concrete implementation
of this method to see those messages.
```

exc_clear(*self*)

```
Clears any recorded exception.

This also changes the "exception_raise" attribute to point
to the appropriate do-nothing method.
```

exc_info(*self*)

```
Returns info about a recorded exception.
```

exception_set(*self*, *exception*=False)

```
Records an exception to be raised at the appropriate time.

This also changes the "exception_raise" attribute to point
to the method that will, in fact
```

executed_with_callbacks(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

executed_without_callbacks(*self*)

```
Called when the task has been successfully executed
and the Taskmaster instance doesn't want to call
the Node's callback methods.
```

fail_continue(*self*)

```
Explicit continue-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

fail_stop(*self*)

```
Explicit stop-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

failed(*self*)

```
Default action when a task fails:  stop the build.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

get_target(*self*)

```
Fetch the target being built or updated by this task.
```

make_ready_all(*self*)

```
Marks all targets in a task ready for execution.

This is used when the interface needs every target Node to be
visited--the canonical example being the "scons -c" option.
```

make_ready_current(*self*)

```
Marks all targets in a task ready for execution if any target
is not current.

This is the default behavior for building only what's necessary.
```

needs_execute(*self*)

```
Always returns True (indicating this Task should always
be executed).

Subclasses that need this behavior (as opposed to the default
of only executing Nodes that are out of date w.r.t. their
dependencies) can use this as follows:

    class MyTaskSubclass(SCons.Taskmaster.Task):
        needs_execute = SCons.Taskmaster.Task.execute_always
```

Overrides: SCons.Taskmaster.Task.needs_execute

postprocess(*self*)

```
Post-processes a task after it's been executed.

This examines all the targets just built (or not, we don't care
if the build was successful, or even if there was no build
because everything was up-to-date) to see if they have any
waiting parent Nodes, or Nodes waiting on a common side effect,
that can be put back on the candidates list.
```

trace_message(*self*, *method*, *node*, *description*='node')

31.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

31.7 Class QuestionTask

object

SCons.Taskmaster.Task

SCons.Taskmaster.AlwaysTask

SCons.Script.Main.QuestionTask

```
An SCons task for the -q (question) option.
```

31.7.1 Methods

prepare(*self*)

```
Called just before the task is executed.

This is mainly intended to give the target Nodes a chance to
unlink underlying files and make all necessary directories before
the Action is actually called to build the targets.
```

Overrides: SCons.Taskmaster.Task.prepare extit(inherited documentation)

execute(*self*)

```
Called to execute the task.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here.  Do thread unsafe stuff in
prepare(), executed() or failed().
```

Overrides: SCons.Taskmaster.Task.execute extit(inherited documentation)

executed(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

Overrides: SCons.Taskmaster.Task.executed extit(inherited documentation)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *tm*, *targets*, *top*, *node*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

`helper for pickle`

__reduce_ex__(*...*)

`helper for pickle`

__repr__(*x*)

`repr(x)`

__setattr__(*...*)

`x.__setattr__('name', value) <==> x.name = value`

__str__(*x*)

`str(x)`

display(*self*, *message*)

```
Hook to allow the calling interface to display a message.

This hook gets called as part of preparing a task for execution
(that is, a Node to be built).  As part of figuring out what Node
should be built next, the actually target list may be altered,
along with a message describing the alteration.  The calling
interface can subclass Task and provide a concrete implementation
of this method to see those messages.
```

exc_clear(*self*)

```
Clears any recorded exception.

This also changes the "exception_raise" attribute to point
to the appropriate do-nothing method.
```

exc_info(*self*)

```
Returns info about a recorded exception.
```

exception_set(*self*, *exception*=False)

```
Records an exception to be raised at the appropriate time.

This also changes the "exception_raise" attribute to point
to the method that will, in fact
```

executed_with_callbacks(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

executed_without_callbacks(*self*)

```
Called when the task has been successfully executed
and the Taskmaster instance doesn't want to call
the Node's callback methods.
```

fail_continue(*self*)

```
Explicit continue-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

fail_stop(*self*)

```
Explicit stop-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

failed(*self*)

```
Default action when a task fails:  stop the build.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

get_target(*self*)

```
Fetch the target being built or updated by this task.
```

make_ready(*self*)

```
Marks all targets in a task ready for execution if any target
is not current.

This is the default behavior for building only what's necessary.
```

make_ready_all(*self*)

```
Marks all targets in a task ready for execution.

This is used when the interface needs every target Node to be
visited--the canonical example being the "scons -c" option.
```

make_ready_current(*self*)

```
Marks all targets in a task ready for execution if any target
is not current.

This is the default behavior for building only what's necessary.
```

needs_execute(*self*)

```
Always returns True (indicating this Task should always
be executed).

Subclasses that need this behavior (as opposed to the default
of only executing Nodes that are out of date w.r.t. their
dependencies) can use this as follows:

    class MyTaskSubclass(SCons.Taskmaster.Task):
        needs_execute = SCons.Taskmaster.Task.execute_always
```

Overrides: SCons.Taskmaster.Task.needs_execute

postprocess(*self*)

```
Post-processes a task after it's been executed.

This examines all the targets just built (or not, we don't care
if the build was successful, or even if there was no build
because everything was up-to-date) to see if they have any
waiting parent Nodes, or Nodes waiting on a common side effect,
that can be put back on the candidates list.
```

trace_message(*self*, *method*, *node*, *description*='node')

31.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

31.8 Class TreePrinter

object
└ **SCons.Script.Main.TreePrinter**

31.8.1 Methods

__init__(*self*, *derived*=False, *prune*=False, *status*=False)
x.__init__(...) initializes x; see x.__class__.__doc__ for signature

Overrides: object.__init__ extit(inherited documentation)

get_all_children(*self*, *node*)

get_derived_children(*self*, *node*)

display(*self*, *t*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

31.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

31.9 Class FakeOptionParser

object
└ **SCons.Script.Main.FakeOptionParser**

```
A do-nothing option parser, used for the initial OptionsParser variable.

During normal SCons operation, the OptionsParser is created right
away by the main() function.  Certain tests scripts however, can
introspect on different Tool modules, the initialization of which
can try to add a new, local option to an otherwise uninitialized
OptionsParser object.  This allows that introspection to happen
without blowing up.
```

31.9.1 Methods

add_local_option(*self*, **args*, ***kw*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*...*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

31.9.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

31.9.3 Class Variables

Name	Description
values	**Value:** FakeOptionValues()

31.10 Class Stats

object
└ **SCons.Script.Main.Stats**

Known Subclasses: SCons.Script.Main.CountStats, SCons.Script.Main.MemStats

31.10.1 Methods

__init__(*self*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

enable(*self*, *outfp*)

do_nothing(*self*, **args*, ***kw*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

31.10.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

31.11 Class CountStats

object

SCons.Script.Main.Stats

SCons.Script.Main.CountStats

31.11.1 Methods

do_append(*self*, *label*)

do_print(*self*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

do_nothing(*self*, **args*, ***kw*)

enable(*self*, *outfp*)

31.11.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

31.12 Class MemStats

object
SCons.Script.Main.Stats
SCons.Script.Main.MemStats

31.12.1 Methods

do_append(*self*, *label*)

do_print(*self*)

__**delattr**__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__**getattribute**__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__**hash**__(*x*)

```
hash(x)
```

__**init**__(*self*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__**reduce**__(*...*)

```
helper for pickle
```

__**reduce_ex**__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

do_nothing(*self*, **args*, ***kw*)

enable(*self*, *outfp*)

31.12.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

32 Module SCons.Script.SConscript'

SCons.Script.SConscript

This module defines the Python API provided to SConscript and SConstruct files.

32.1 Functions

get_calling_namespaces()

Return the locals and globals for the function that called into this module in the current call stack.

compute_exports(*exports*)

Compute a dictionary of exports given one of the parameters to the Export() function or the exports argument to SConscript().

Return(**vars*, ***kw*)

SConscript_exception(*file*=sys.stdout)

Print an exception stack trace just for the SConscript file(s). This will show users who have Python errors where the problem is, without cluttering the output with all of the internal calls leading up to where we exec the SConscript.

annotate(*node*)

Annotate a node with the stack frame describing the SConscript file and line number that created it.

Configure(**args*, ***kw*)

get_DefaultEnvironmentProxy()

BuildDefaultGlobals()

Create a dictionary containing all the default globals for SConstruct and SConscript files.

32.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Script/SConscript.py 5023 2010/06/14 22...

continued on next page

Name	Description
launch_dir	**Value:** `'/home/scons/GregBuild'`
GlobalDict	**Value:** `False`
global_exports	**Value:** {}
sconscript_chdir	**Value:** `1`
call_stack	**Value:** `[]`
stack_bottom	**Value:** `'% Stack boTTom %'`

32.3 Class SConscriptReturn

32.3.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

```
str(x)
```

Overrides: object.__str__

32.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

32.4 Class Frame

object

SCons.Script.SConscript'.Frame

```
A frame on the SConstruct/SConscript call stack
```

32.4.1 Methods

__init__(*self*, *fs*, *exports*, *sconscript*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__new__(*T*, *S*, *...*)

Return Value

`a new object with type S, a subtype of T`

__reduce__(*...*)

`helper for pickle`

__reduce_ex__(*...*)

`helper for pickle`

__repr__(*x*)

`repr(x)`

__setattr__(*...*)

`x.__setattr__('name', value) <==> x.name = value`

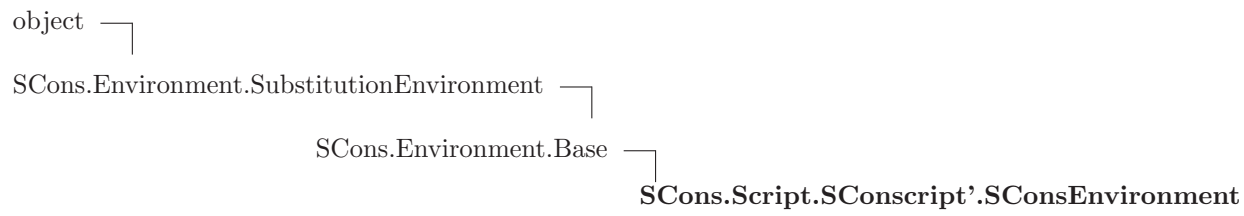
__str__(*x*)

`str(x)`

32.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

32.5 Class SConsEnvironment




```
An Environment subclass that contains all of the methods that
are particular to the wrapper SCons interface and which aren't
(or shouldn't be) part of the build engine itself.

Note that not all of the methods of this class have corresponding
global functions, there are some private methods.
```

32.5.1 Methods

Configure(*self*, **args*, ***kw*)
Overrides: SCons.Environment.Base.Configure

Default(*self*, **targets*)

EnsureSConsVersion(*self*, *major*, *minor*, *revision*=0)

```
Exit abnormally if the SCons version is not late enough.
```

EnsurePythonVersion(*self*, *major*, *minor*)

```
Exit abnormally if the Python version is not late enough.
```

Exit(*self*, *value*=0)

Export(*self*, **vars*, ***kw*)

GetLaunchDir(*self*)

GetOption(*self*, *name*)

Help(*self*, *text*)

Import(*self*, **vars*)

SConscript(*self*, **ls*, ***kw*)

SConscriptChdir(*self*, *flag*)

SetOption(*self*, *name*, *value*)

Action(*self*, **args*, ***kw*)

AddMethod(*self*, *function*, *name*=`False`)

```
Adds the specified function as a method of this construction
environment with the specified name.  If the name is omitted,
the default name is the name of the function itself.
```

AddPostAction(*self*, *files*, *action*)

AddPreAction(*self*, *files*, *action*)

Alias(*self*, *target*, *source*=`[]`, *action*=`False`, ***kw*)

AlwaysBuild(*self*, **targets*)

Append(*self*, ***kw*)

```
Append values to existing construction variables
in an Environment.
```

AppendENVPath(*self*, *name*, *newpath*, *envname*=`'ENV'`, *sep*=`':'`, *delete_existing*=`1`)

```
Append path elements to the path 'name' in the 'ENV'
dictionary for this environment.  Will only add any particular
path once, and will normpath and normcase all paths to help
assure this.  This can also handle the case where the env
variable is a list instead of a string.

If delete_existing is 0, a newpath which is already in the path
will not be moved to the end (it will be left where it is).
```

AppendUnique(*self*, *delete_existing*=`0`, ***kw*)

```
Append values to existing construction variables
in an Environment, if they're not already there.
If delete_existing is 1, removes existing values first, so
values move to end.
```

BuildDir(*self*, **args*, ***kw*)

Builder(*self*, ***kw*)

CacheDir(*self*, *path*)

Clean(*self*, *targets*, *files*)

Clone(*self*, *tools*=[], *toolpath*=False, *parse_flags*=False, ***kw*)

```
Return a copy of a construction Environment.  The
copy is like a Python "deep copy"--that is, independent
copies are made recursively of each objects--except that
a reference is copied when an object is not deep-copyable
(like a function).  There are no references to any mutable
objects in the original Environment.
```

Command(*self*, *target*, *source*, *action*, ***kw*)

```
Builds the supplied target files from the supplied
source files using the supplied action.  Action may
be any type that the Builder constructor will accept
for an action.
```

Copy(*self*, **args*, ***kw*)

Decider(*self*, *function*)

Depends(*self*, *target*, *dependency*)

```
Explicity specify that 'target's depend on 'dependency'.
```

Detect(*self*, *progs*)

```
Return the first available program in progs.
```

Dictionary(*self*, **args*)

Dir(*self*, *name*, **args*, ***kw*)

Dump(*self*, *key*=False)

```
Using the standard Python pretty printer, dump the contents of the
scons build environment to stdout.

If the key passed in is anything other than None, then that will
be used as an index into the build environment dictionary and
whatever is found there will be fed into the pretty printer. Note
that this key is case sensitive.
```

Entry(*self*, *name*, **args*, ***kw*)

Environment(*self*, ***kw*)

Execute(*self*, *action*, **args*, ***kw*)

```
Directly execute an action through an Environment
```

File(*self*, *name*, **args*, ***kw*)

FindFile(*self*, *file*, *dirs*)

FindInstalledFiles(*self*)

```
returns the list of all targets of the Install and InstallAs Builder.
```

FindIxes(*self*, *paths*, *prefix*, *suffix*)

```
Search a list of paths for something that matches the prefix and suffix.

paths - the list of paths or nodes.
prefix - construction variable for the prefix.
suffix - construction variable for the suffix.
```

FindSourceFiles(*self*, *node*='.')

```
returns a list of all source files.
```

Flatten(*self*, *sequence*)

GetBuildPath(*self*, *files*)

Glob(*self*, *pattern*, *ondisk*=True, *source*=False, *strings*=False)

Ignore(*self*, *target*, *dependency*)

```
Ignore a dependency.
```

Literal(*self*, *string*)

Local(*self*, **targets*)

MergeFlags(*self*, *args*, *unique*=1, *dict*=False)

```
Merge the dict in args into the construction variables of this
env, or the passed-in dict.  If args is not a dict, it is
converted into a dict using ParseFlags.  If unique is not set,
the flags are appended rather than merged.
```

NoCache(*self*, **targets*)

```
Tags a target so that it will not be cached
```

NoClean(*self*, **targets*)

```
Tags a target so that it will not be cleaned by -c
```

Override(*self*, *overrides*)

```
Produce a modified environment whose variables are overriden by
the overrides dictionaries.  "overrides" is a dictionary that
will override the variables of this environment.

This function is much more efficient than Clone() or creating
a new Environment because it doesn't copy the construction
environment dictionary, it just wraps the underlying construction
environment, and doesn't even create a wrapper object if there
are no overrides.
```

ParseConfig(*self*, *command*, *function*=False, *unique*=1)

```
Use the specified function to parse the output of the command
in order to modify the current environment.  The 'command' can
be a string or a list of strings representing a command and
its arguments.  'Function' is an optional argument that takes
the environment, the output of the command, and the unique flag.
If no function is specified, MergeFlags, which treats the output
as the result of a typical 'X-config' command (i.e. gtk-config),
will merge the output into the appropriate variables.
```

ParseDepends(*self*, *filename*, *must_exist*=False, *only_one*=0)

```
Parse a mkdep-style file for explicit dependencies.  This is
completely abusable, and should be unnecessary in the "normal"
case of proper SCons configuration, but it may help make
the transition from a Make hierarchy easier for some people
to swallow.  It can also be genuinely useful when using a tool
that can write a .d file, but for which writing a scanner would
be too complicated.
```

ParseFlags(*self*, **flags*)

```
Parse the set of flags and return a dict with the flags placed
in the appropriate entry.  The flags are treated as a typical
set of command-line flags for a GNU-like toolchain and used to
populate the entries in the dict immediately below.  If one of
the flag strings begins with a bang (exclamation mark), it is
assumed to be a command and the rest of the string is executed;
the result of that evaluation is then added to the dict.
```

Platform(*self*, *platform*)

Precious(*self*, **targets*)

Prepend(*self*, ***kw*)

```
Prepend values to existing construction variables
in an Environment.
```

PrependENVPath(*self*, *name*, *newpath*, *envname*='ENV', *sep*=':', *delete_existing*=1)

```
Prepend path elements to the path 'name' in the 'ENV'
dictionary for this environment.  Will only add any particular
path once, and will normpath and normcase all paths to help
assure this.  This can also handle the case where the env
variable is a list instead of a string.

If delete_existing is 0, a newpath which is already in the path
will not be moved to the front (it will be left where it is).
```

PrependUnique(*self*, *delete_existing*=0, ***kw*)

```
Prepend values to existing construction variables
in an Environment, if they're not already there.
If delete_existing is 1, removes existing values first, so
values move to front.
```

RemoveMethod(*self*, *function*)

```
Removes the specified function's MethodWrapper from the
added_methods list, so we don't re-bind it when making a clone.
```

Replace(*self*, ***kw*)

```
Replace existing construction variables in an Environment
with new construction variables and/or values.
```

ReplaceIxes(*self*, *path*, *old_prefix*, *old_suffix*, *new_prefix*, *new_suffix*)

```
Replace old_prefix with new_prefix and old_suffix with new_suffix.

env - Environment used to interpolate variables.
path - the path that will be modified.
old_prefix - construction variable for the old prefix.
old_suffix - construction variable for the old suffix.
new_prefix - construction variable for the new prefix.
new_suffix - construction variable for the new suffix.
```

Repository(*self*, **dirs*, ***kw*)

Requires(*self*, *target*, *prerequisite*)

```
Specify that 'prerequisite' must be built before 'target',
(but 'target' does not actually depend on 'prerequisite'
and need not be rebuilt if it changes).
```

SConsignFile(*self*, *name*='.sconsign', *dbm_module*=False)

Scanner(*self*, **args*, ***kw*)

SetDefault(*self*, ***kw*)

SideEffect(*self*, *side_effect*, *target*)

```
Tell scons that side_effects are built as side
effects of building targets.
```

SourceCode(*self*, *entry*, *builder*)

```
Arrange for a source code builder for (part of) a tree.
```

SourceSignatures(*self*, *type*)

Split(*self*, *arg*)

```
This function converts a string or list into a list of strings
or Nodes.  This makes things easier for users by allowing files to
be specified as a white-space separated list to be split.
The input rules are:
    - A single string containing names separated by spaces. These will be
      split apart at the spaces.
    - A single Node instance
    - A list containing either strings or Node instances. Any strings
      in the list are not split at spaces.
In all cases, the function returns a list of Nodes and strings.
```

TargetSignatures(*self*, *type*)

Tool(*self*, *tool*, *toolpath*=`False`, ***kw*)

Value(*self*, *value*, *built_value*=`False`)

VariantDir(*self*, *variant_dir*, *src_dir*, *duplicate*=`1`)

WhereIs(*self*, *prog*, *path*=`False`, *pathext*=`False`, *reject*=`[]`)

```
Find prog in the path.
```

__cmp__(*self*, *other*)

__contains__(*self*, *key*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__delitem__(*self*, *key*)

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__getitem__(*self*, *key*)

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *platform*=`False`, *tools*=`False`, *toolpath*=`False`, *variables*=`False`, *parse_flags*=`False`, ***kw*)

```
Initialization of a basic SCons construction environment,
including setting up special construction variables like BUILDER,
PLATFORM, etc., and searching for and applying available Tools.

Note that we do *not* call the underlying base class
(SubsitutionEnvironment) initialization, because we need to
initialize things in a very specific order that doesn't work
with the much simpler base class initialization.
```

Overrides: SCons.Environment.SubstitutionEnvironment.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__**reduce**__(*...*)

```
helper for pickle
```

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__**setitem**__(*self*, *key*, *value*)

__**str**__(*x*)

```
str(x)
```

arg2nodes(*self*, *args*, *node_factory*=<class 'SCons.Environment._Null'>, *lookup_list*=<class 'SCons.Environment._Null'>, ***kw*)

backtick(*self*, *command*)

get(*self*, *key*, *default*=False)

```
Emulates the get() method of dictionaries.
```

get_CacheDir(*self*)

get_builder(*self*, *name*)

```
Fetch the builder with the specified name from the environment.
```

get_factory(*self*, *factory*, *default*='File')

```
Return a factory function for creating Nodes for this
construction environment.
```

get_scanner(*self*, *skey*)

```
Find the appropriate scanner given a key (usually a file suffix).
```

get_src_sig_type(*self*)

get_tgt_sig_type(*self*)

gvars(*self*)

has_key(*self*, *key*)

items(*self*)

lvars(*self*)

scanner_map_delete(*self*, *kw*=False)

```
Delete the cached scanner map (if we need to).
```

subst(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Recursively interpolates construction variables from the
Environment into the specified string, returning the expanded
result.  Construction variables are specified by a $ prefix
in the string and begin with an initial underscore or
alphabetic character followed by any number of underscores
or alphanumeric characters.  The construction variable names
may be surrounded by curly braces to separate the name from
trailing characters.
```

subst_kw(*self*, *kw*, *raw*=0, *target*=False, *source*=False)

subst_list(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Calls through to SCons.Subst.scons_subst_list().  See
the documentation for that function.
```

subst_path(*self*, *path*, *target*=False, *source*=False)

```
Substitute a path list, turning EntryProxies into Nodes
and leaving Nodes (and other objects) as-is.
```

subst_target_source(*self*, *string*, *raw*=0, *target*=False, *source*=False, *conv*=False, *executor*=False)

```
Recursively interpolates construction variables from the
Environment into the specified string, returning the expanded
result.  Construction variables are specified by a $ prefix
in the string and begin with an initial underscore or
alphabetic character followed by any number of underscores
or alphanumeric characters.  The construction variable names
may be surrounded by curly braces to separate the name from
trailing characters.
```

32.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

32.5.3 Class Variables

Name	Description
__metaclass__	**Value:** SCons.Memoize.Memoized_Metaclass
memoizer_counters	**Value:** []

32.6 Class DefaultEnvironmentCall

object
└ **SCons.Script.SConscript'.DefaultEnvironmentCall**

```
A class that implements "global function" calls of
Environment methods by fetching the specified method from the
DefaultEnvironment's class.  Note that this uses an intermediate
proxy class instead of calling the DefaultEnvironment method
directly so that the proxy can override the subst() method and
thereby prevent expansion of construction variables (since from
the user's point of view this was called as a global function,
with no associated construction environment).
```

32.6.1 Methods

__init__(*self*, *method_name*, *subst*=0)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__call__(*self*, **args*, ***kw*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

32.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

33 Module SCons.Sig

```
Place-holder for the old SCons.Sig module hierarchy

This is no longer used, but code out there (such as the NSIS module on
the SCons wiki) may try to import SCons.Sig.  If so, we generate a warning
that points them to the line that caused the import, and don't die.

If someone actually tried to use the sub-modules or functions within
the package (for example, SCons.Sig.MD5.signature()), then they'll still
get an AttributeError, but at least they'll know where to start looking.
```

33.1 Variables

Name	Description
__revision__	**Value:** `'src/engine/SCons/Sig.py 5023 2010/06/14 22:05:46 scons'`
__doc__	**Value:** `"""Place-holder for the old SCons.Sig module hierar...`
msg	**Value:** `'The SCons.Sig module no longer exists.\n Remove the f...`
default_calc	**Value:** `False`
default_module	**Value:** `False`
MD5	**Value:** `MD5Null()`
TimeStamp	**Value:** `TimeStampNull()`

33.2 Class MD5Null

object
└ SCons.Util.Null
└ **SCons.Sig.MD5Null**

33.2.1 Methods

__repr__(*self*)
Overrides: SCons.Util.Null.__repr__

__call__(*self*, **args*, ***kwargs*)

__delattr__(*self*, *name*)
`x.__delattr__('name') <==> del x.name`
Overrides: object.__delattr__ extit(inherited documentation)

__getattr__(*self*, *name*)

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, **args*, ***kwargs*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*cls*, **args*, ***kwargs*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: object.__new__ extit(inherited documentation)

__nonzero__(*self*)

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__setattr__(*self*, *name*, *value*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__ extit(inherited documentation)

__str__(*x*)

```
str(x)
```

33.2.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

33.3 Class TimeStampNull

33.3.1 Methods

__repr__(*self*)
Overrides: SCons.Util.Null.__repr__

__call__(*self*, **args*, ***kwargs*)

__delattr__(*self*, *name*)
`x.__delattr__('name') <==> del x.name`
Overrides: object.__delattr__ extit(inherited documentation)

__getattr__(*self*, *name*)

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__init__(*self*, **args*, ***kwargs*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

__new__(*cls*, **args*, ***kwargs*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: object.__new__ extit(inherited documentation)

__nonzero__(*self*)

__reduce__(*...*)

`helper for pickle`

__reduce_ex__(*...*)

`helper for pickle`

__setattr__(*self*, *name*, *value*)
`x.__setattr__('name', value) <==> x.name = value`

Overrides: object.__setattr__ extit(inherited documentation)

__str__(*x*)

`str(x)`

33.3.2 Properties

Name	Description
__class__	**Value:** `<attribute '__class__' of 'object' objects>`

34 Module SCons.Subst

SCons.Subst

SCons string substitution.

34.1 Functions

SetAllowableExceptions(**excepts*)

raise_exception(*exception*, *target*, *s*)

quote_spaces(*arg*)

Generic function for putting double quotes around any string that
has white space in it.

escape_list(*mylist*, *escape_func*)

Escape a list of arguments by running the specified escape_func
on every object in the list that has an escape() method.

subst_dict(*target*, *source*)

Create a dictionary for substitution of special
construction variables.

This translates the following special arguments:

target - the target (object or array of objects),
         used to generate the TARGET and TARGETS
         construction variables

source - the source (object or array of objects),
         used to generate the SOURCES and SOURCE
         construction variables

scons_subst(*strSubst*, *env*, *mode*=1, *target*=False, *source*=False, *gvars*={}, *lvars*={}, *conv*=False)

Expand a string or list containing construction variable
substitutions.

This is the work-horse function for substitutions in file names
and the like. The companion scons_subst_list() function (below)
handles separating command lines into lists of arguments, so see
that function if that's what you're looking for.

scons_subst_list(*strSubst*, *env*, *mode*=1, *target*=False, *source*=False, *gvars*={}, *lvars*={}, *conv*=False)

```
Substitute construction variables in a string (or list or other
object) and separate the arguments into a command list.

The companion scons_subst() function (above) handles basic
substitutions within strings, so see that function instead
if that's what you're looking for.
```

scons_subst_once(*strSubst*, *env*, *key*)

```
Perform single (non-recursive) substitution of a single
construction variable keyword.

This is used when setting a variable when copying or overriding values
in an Environment.  We want to capture (expand) the old value before
we override it, so people can do things like:

    env2 = env.Clone(CCFLAGS = '$CCFLAGS -g')

We do this with some straightforward, brute-force code here...
```

34.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Subst.py 5023 2010/06/14 22:05:46 scons'
AllowableExceptions	**Value:** (<type 'exceptions.IndexError'>, <type 'exceptions.NameEr...
NullNodesList	**Value:** Null(0x0843A40C)
SUBST_CMD	**Value:** 0
SUBST_RAW	**Value:** 1
SUBST_SIG	**Value:** 2

34.3 Class Literal

object
└ **SCons.Subst.Literal**

```
A wrapper for a string.  If you use this object wrapped
around a string, then it will be interpreted as literal.
When passed to the command interpreter, all special
characters will be escaped.
```

34.3.1 Methods

__init__(*self*, *lstr*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__str__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

escape(*self*, *escape_func*)

for_signature(*self*)

is_literal(*self*)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__new__(*T*, *S*, *...*)

Return Value

`a new object with type S, a subtype of T`

__reduce__(*...*)

`helper for pickle`

__reduce_ex__(*...*)

`helper for pickle`

__repr__(*x*)

`repr(x)`

__setattr__(*...*)

`x.__setattr__('name', value) <==> x.name = value`

34.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

34.4 Class SpecialAttrWrapper

object
└
SCons.Subst.SpecialAttrWrapper

```
This is a wrapper for what we call a 'Node special attribute.'
This is any of the attributes of a Node that we can reference from
Environment variable substitution, such as $TARGET.abspath or
$SOURCES[1].filebase.  We implement the same methods as Literal
so we can handle special characters, plus a for_signature method,
such that we can return some canonical string during signature
calculation to avoid unnecessary rebuilds.
```

34.4.1 Methods

__init__(*self*, *lstr*, *for_signature*=False)

```
The for_signature parameter, if supplied, will be the
canonical string we return from for_signature().  Else
we will simply return lstr.
```

Overrides: object.__init__

__str__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

escape(*self*, *escape_func*)

for_signature(*self*)

is_literal(*self*)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__**new**__(*T*, *S*, *...*)

Return Value
a new object with type S, a subtype of T

__**reduce**__(*...*)

helper for pickle

__**reduce_ex**__(*...*)

helper for pickle

__**repr**__(*x*)

repr(x)

__**setattr**__(*...*)

x.__setattr__('name', value) <==> x.name = value

34.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

34.5 Class CmdStringHolder

UserString.UserString
└
SCons.Subst.CmdStringHolder

This is a special class used to hold strings generated by scons_subst() and scons_subst_list(). It defines a special method escape(). When passed a function with an escape algorithm for a particular platform, it will return the contained string with the proper escape sequences inserted.

34.5.1 Methods

__**init**__(*self*, *cmd*, *literal*=False)
Overrides: UserString.UserString.__init__

is_literal(*self*)

escape(*self*, *escape_func*, *quote_func*=<function quote_spaces at 0x843448c>)

```
Escape the string with the supplied function.  The
function is expected to take an arbitrary string, then
return it with all special characters escaped and ready
for passing to the command interpreter.

After calling this function, the next call to str() will
return the escaped string.
```

__**add**__(*self*, *other*)

__**cmp**__(*self*, *string*)

__**complex**__(*self*)

__**contains**__(*self*, *char*)

__**float**__(*self*)

__**getitem**__(*self*, *index*)

__**getslice**__(*self*, *start*, *end*)

__**hash**__(*self*)

__**int**__(*self*)

__**len**__(*self*)

__**long**__(*self*)

__**mod**__(*self*, *args*)

__**mul**__(*self*, *n*)

__**radd**__(*self*, *other*)

__**repr**__(*self*)

__**rmul**__(*self*, *n*)

__**str**__(*self*)

capitalize(*self*)

center(*self*, *width*, **args*)

count(*self*, *sub*, *start*=0, *end*=2147483647)

decode(*self*, *encoding*=False, *errors*=False)

encode(*self*, *encoding*=False, *errors*=False)

endswith(*self*, *suffix*, *start*=0, *end*=2147483647)

expandtabs(*self*, *tabsize*=8)

find(*self*, *sub*, *start*=0, *end*=2147483647)

index(*self*, *sub*, *start*=0, *end*=2147483647)

isalnum(*self*)

isalpha(*self*)

isdecimal(*self*)

isdigit(*self*)

islower(*self*)

isnumeric(*self*)

isspace(*self*)

istitle(*self*)

isupper(*self*)

join(*self*, *seq*)

ljust(*self*, *width*, **args*)

lower(*self*)

lstrip(*self*, *chars*=False)

partition(*self*, *sep*)

replace(*self*, *old*, *new*, *maxsplit*=-1)

rfind(*self*, *sub*, *start*=0, *end*=2147483647)

rindex(*self*, *sub*, *start*=0, *end*=2147483647)

rjust(*self*, *width*, **args*)

rpartition(*self*, *sep*)

rsplit(*self*, *sep*=False, *maxsplit*=-1)

rstrip(*self*, *chars*=False)

split(*self*, *sep*=False, *maxsplit*=-1)

splitlines(*self*, *keepends*=0)

startswith(*self*, *prefix*, *start*=0, *end*=2147483647)

strip(*self*, *chars*=False)

swapcase(*self*)

title(*self*)

translate(*self*, **args*)

upper(*self*)

zfill(*self*, *width*)

34.6 Class NLWrapper

object
└ **SCons.Subst.NLWrapper**

```
A wrapper class that delays turning a list of sources or targets
into a NodeList until it's needed.  The specified function supplied
when the object is initialized is responsible for turning raw nodes
into proxies that implement the special attributes like .abspath,
.source, etc.  This way, we avoid creating those proxies just
"in case" someone is going to use $TARGET or the like, and only
go through the trouble if we really have to.

In practice, this might be a wash performance-wise, but it's a little
cleaner conceptually...
```

34.6.1 Methods

__init__(*self*, *list*, *func*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__new__(*T*, *S*, *...*)

Return Value
`a new object with type S, a subtype of T`

__reduce__(*...*)

`helper for pickle`

__reduce_ex__(*...*)

`helper for pickle`

__repr__(*x*)

`repr(x)`

__setattr__(*...*)

`x.__setattr__('name', value) <==> x.name = value`

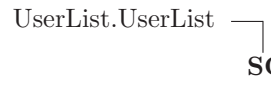
__str__(*x*)

`str(x)`

34.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

34.7 Class Targets_or_Sources




```
A class that implements $TARGETS or $SOURCES expansions by in turn
wrapping a NLWrapper.  This class handles the different methods used
to access the list, calling the NLWrapper to create proxies on demand.

Note that we subclass collections.UserList purely so that the
is_Sequence() function will identify an object of this class as
a list during variable expansion.  We're not really using any
collections.UserList methods in practice.
```

34.7.1 Methods

__init__(*self*, *nl*)
Overrides: UserList.UserList.__init__

__getattr__(*self*, *attr*)

__getitem__(*self*, *i*)
Overrides: UserList.UserList.__getitem__

__getslice__(*self*, *i*, *j*)
Overrides: UserList.UserList.__getslice__

__str__(*self*)

__repr__(*self*)
Overrides: UserList.UserList.__repr__

__add__(*self*, *other*)

__cmp__(*self*, *other*)

__contains__(*self*, *item*)

__delitem__(*self*, *i*)

__delslice__(*self*, *i*, *j*)

__eq__(*self*, *other*)

__ge__(*self*, *other*)

__gt__(*self*, *other*)

__**iadd**__(*self*, *other*)

__**imul**__(*self*, *n*)

__**le**__(*self*, *other*)

__**len**__(*self*)

__**lt**__(*self*, *other*)

__**mul**__(*self*, *n*)

__**ne**__(*self*, *other*)

__**radd**__(*self*, *other*)

__**rmul**__(*self*, *n*)

__**setitem**__(*self*, *i*, *item*)

__**setslice**__(*self*, *i*, *j*, *other*)

append(*self*, *item*)

count(*self*, *item*)

extend(*self*, *other*)

index(*self*, *item*, **args*)

insert(*self*, *i*, *item*)

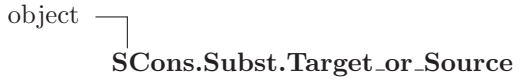
pop(*self*, *i*=-1)

remove(*self*, *item*)

reverse(*self*)

sort(*self*, **args*, ***kwds*)

34.8 Class Target_or_Source



```
A class that implements $TARGET or $SOURCE expansions by in turn
wrapping a NLWrapper.  This class handles the different methods used
to access an individual proxy Node, calling the NLWrapper to create
a proxy on demand.
```

34.8.1 Methods

__init__(*self*, *nl*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__getattr__(*self*, *attr*)

__str__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

__repr__(*self*)
`repr(x)`

Overrides: object.__repr__ extit(inherited documentation)

__delattr__(...)

`x.__delattr__('name') <==> del x.name`

__getattribute__(...)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

`helper for pickle`

__reduce_ex__(...)

`helper for pickle`

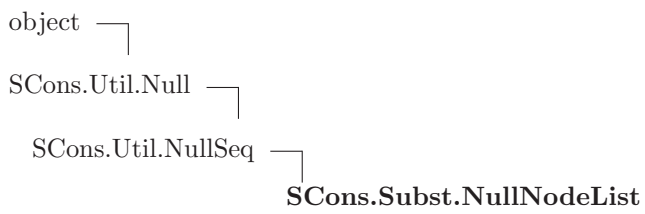
__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

34.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

34.9 Class NullNodeList



34.9.1 Methods

__call__(*self*, **args*, ***kwargs*)
Overrides: SCons.Util.Null.__call__

__str__(*self*)
`str(x)`

Overrides: object.__str__ extit(inherited documentation)

__delattr__(*self*, *name*)
`x.__delattr__('name') <==> del x.name`

Overrides: object.__delattr__ extit(inherited documentation)

__delitem__(*self*, *i*)

__getattr__(*self*, *name*)

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__getitem__(*self*, *i*)

__hash__(*x*)

```
hash(x)
```

__**init**__(*self*, **args*, ***kwargs*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__**iter**__(*self*)

__**len**__(*self*)

__**new**__(*cls*, **args*, ***kwargs*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: object.__new__ extit(inherited documentation)

__**nonzero**__(*self*)

__**reduce**__(...)

`helper for pickle`

__**reduce_ex**__(...)

`helper for pickle`

__**repr**__(*self*)
`repr(x)`

Overrides: object.__repr__ extit(inherited documentation)

__**setattr**__(*self*, *name*, *value*)
`x.__setattr__('name', value) <==> x.name = value`

Overrides: object.__setattr__ extit(inherited documentation)

__**setitem**__(*self*, *i*, *v*)

34.9.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

35 Module SCons.Taskmaster

```
Generic Taskmaster module for the SCons build engine.

This module contains the primary interface(s) between a wrapping user
interface and the SCons build engine.  There are two key classes here:

    Taskmaster
        This is the main engine for walking the dependency graph and
        calling things to decide what does or doesn't need to be built.

    Task
        This is the base class for allowing a wrapping interface to
        decide what does or doesn't actually need to be done.  The
        intention is for a wrapping interface to subclass this as
        appropriate for different types of behavior it may need.

        The canonical example is the SCons native Python interface,
        which has Task subclasses that handle its specific behavior,
        like printing "'foo' is up to date" when a top-level target
        doesn't need to be built, and handling the -c option by removing
        targets as its "build" action.  There is also a separate subclass
        for suppressing this output when the -q option is used.

        The Taskmaster instantiates a Task object for each (set of)
        target(s) that it decides need to be evaluated and/or built.
```

35.1 Functions

dump_stats()

find_cycle(*stack*, *visited*)

35.2 Variables

Name	Description
__doc__	**Value:** ...
__revision__	**Value:** 'src/engine/SCons/Taskmaster.py 5023 2010/06/14 22:05:46 ...
StateString	**Value:** {0: 'no_state', 1: 'pending', 2: 'executing', 3: 'up_to_d...
NODE_NO_STATE	**Value:** 0
NODE_PENDING	**Value:** 1
NODE_EXECUTING	**Value:** 2
NODE_UP_TO_DATE	**Value:** 3
NODE_EXECUTED	**Value:** 4
NODE_FAILED	**Value:** 5

continued on next page

Name	Description
CollectStats	**Value:** `False`
StatsNodes	**Value:** `[]`
fmt	**Value:** `'%(considered)3d %(already_handled)3d %(problem)3d %(chil...`

35.3 Class Stats

object
└ **SCons.Taskmaster.Stats**

```
A simple class for holding statistics about the disposition of a
Node by the Taskmaster.  If we're collecting statistics, each Node
processed by the Taskmaster gets one of these attached, in which case
the Taskmaster records its decision each time it processes the Node.
(Ideally, that's just once per Node.)
```

35.3.1 Methods

__init__(*self*)

```
Instantiates a Taskmaster.Stats object, initializing all
appropriate counters to zero.
```

Overrides: object.__init__

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

35.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

35.4 Class Task

object
└ **SCons.Taskmaster.Task**

Known Subclasses: SCons.Taskmaster.AlwaysTask, SCons.Taskmaster.OutOfDateTask

```
Default SCons build engine task.

This controls the interaction of the actual building of node
and the rest of the engine.

This is expected to handle all of the normally-customizable
aspects of controlling a build, so any given application
*should* be able to do what it wants by sub-classing this
class and overriding methods as appropriate.  If an application
needs to customze something by sub-classing Taskmaster (or
some other build engine class), we should first try to migrate
that functionality into this class.

Note that it's generally a good idea for sub-classes to call
these methods explicitly to update state, etc., rather than
roll their own interaction with Taskmaster from scratch.
```

35.4.1 Methods

__init__(*self*, *tm*, *targets*, *top*, *node*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

trace_message(*self*, *method*, *node*, *description*=`'node'`)

display(*self*, *message*)

```
Hook to allow the calling interface to display a message.

This hook gets called as part of preparing a task for execution
(that is, a Node to be built).  As part of figuring out what Node
should be built next, the actually target list may be altered,
along with a message describing the alteration.  The calling
interface can subclass Task and provide a concrete implementation
of this method to see those messages.
```

prepare(*self*)

```
Called just before the task is executed.

This is mainly intended to give the target Nodes a chance to
unlink underlying files and make all necessary directories before
the Action is actually called to build the targets.
```

get_target(*self*)

```
Fetch the target being built or updated by this task.
```

needs_execute(*self*)

execute(*self*)

```
Called to execute the task.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here.  Do thread unsafe stuff in
prepare(), executed() or failed().
```

executed_without_callbacks(*self*)

```
Called when the task has been successfully executed
and the Taskmaster instance doesn't want to call
the Node's callback methods.
```

executed_with_callbacks(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

executed(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

failed(*self*)

```
Default action when a task fails:  stop the build.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

fail_stop(*self*)

```
Explicit stop-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

fail_continue(*self*)

```
Explicit continue-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

make_ready_all(*self*)

```
Marks all targets in a task ready for execution.

This is used when the interface needs every target Node to be
visited--the canonical example being the "scons -c" option.
```

make_ready_current(*self*)

```
Marks all targets in a task ready for execution if any target
is not current.

This is the default behavior for building only what's necessary.
```

make_ready(*self*)

```
Marks all targets in a task ready for execution if any target
is not current.

This is the default behavior for building only what's necessary.
```

postprocess(*self*)

```
Post-processes a task after it's been executed.

This examines all the targets just built (or not, we don't care
if the build was successful, or even if there was no build
because everything was up-to-date) to see if they have any
waiting parent Nodes, or Nodes waiting on a common side effect,
that can be put back on the candidates list.
```

exc_info(*self*)

```
Returns info about a recorded exception.
```

exc_clear(*self*)

```
Clears any recorded exception.

This also changes the "exception_raise" attribute to point
to the appropriate do-nothing method.
```

exception_set(*self*, *exception*=False)

```
Records an exception to be raised at the appropriate time.

This also changes the "exception_raise" attribute to point
to the method that will, in fact
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

helper for pickle

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

__str__(*x*)

str(x)

35.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

35.5 Class AlwaysTask

object

SCons.Taskmaster.Task

SCons.Taskmaster.AlwaysTask

Known Subclasses: SCons.SConf.SConfBuildTask, SCons.Script.Main.CleanTask, SCons.Script.Main.QuestionTask

35.5.1 Methods

needs_execute(*self*)

```
Always returns True (indicating this Task should always
be executed).

Subclasses that need this behavior (as opposed to the default
of only executing Nodes that are out of date w.r.t. their
dependencies) can use this as follows:

    class MyTaskSubclass(SCons.Taskmaster.Task):
        needs_execute = SCons.Taskmaster.Task.execute_always
```

Overrides: SCons.Taskmaster.Task.needs_execute

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *tm*, *targets*, *top*, *node*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

display(*self*, *message*)

```
Hook to allow the calling interface to display a message.

This hook gets called as part of preparing a task for execution
(that is, a Node to be built).  As part of figuring out what Node
should be built next, the actually target list may be altered,
along with a message describing the alteration.  The calling
interface can subclass Task and provide a concrete implementation
of this method to see those messages.
```

exc_clear(*self*)

```
Clears any recorded exception.

This also changes the "exception_raise" attribute to point
to the appropriate do-nothing method.
```

exc_info(*self*)

```
Returns info about a recorded exception.
```

exception_set(*self*, *exception*=False)

```
Records an exception to be raised at the appropriate time.

This also changes the "exception_raise" attribute to point
to the method that will, in fact
```

execute(*self*)

```
Called to execute the task.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here.  Do thread unsafe stuff in
prepare(), executed() or failed().
```

executed(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

executed_with_callbacks(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

executed_without_callbacks(*self*)

```
Called when the task has been successfully executed
and the Taskmaster instance doesn't want to call
the Node's callback methods.
```

fail_continue(*self*)

```
Explicit continue-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

fail_stop(*self*)

```
Explicit stop-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

failed(*self*)

```
Default action when a task fails:  stop the build.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

get_target(*self*)

```
Fetch the target being built or updated by this task.
```

make_ready(*self*)

```
Marks all targets in a task ready for execution if any target
is not current.

This is the default behavior for building only what's necessary.
```

make_ready_all(*self*)

```
Marks all targets in a task ready for execution.

This is used when the interface needs every target Node to be
visited--the canonical example being the "scons -c" option.
```

make_ready_current(*self*)

```
Marks all targets in a task ready for execution if any target
is not current.

This is the default behavior for building only what's necessary.
```

postprocess(*self*)

```
Post-processes a task after it's been executed.

This examines all the targets just built (or not, we don't care
if the build was successful, or even if there was no build
because everything was up-to-date) to see if they have any
waiting parent Nodes, or Nodes waiting on a common side effect,
that can be put back on the candidates list.
```

prepare(*self*)

```
Called just before the task is executed.

This is mainly intended to give the target Nodes a chance to
unlink underlying files and make all necessary directories before
the Action is actually called to build the targets.
```

trace_message(*self*, *method*, *node*, *description*='node')

35.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

35.6 Class OutOfDateTask

object
SCons.Taskmaster.Task
SCons.Taskmaster.OutOfDateTask

Known Subclasses: SCons.Script.Main.BuildTask

35.6.1 Methods

needs_execute(*self*)

```
Returns True (indicating this Task should be executed) if this
Task's target state indicates it needs executing, which has
already been determined by an earlier up-to-date check.
```

Overrides: SCons.Taskmaster.Task.needs_execute

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *tm*, *targets*, *top*, *node*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

display(*self*, *message*)

```
Hook to allow the calling interface to display a message.

This hook gets called as part of preparing a task for execution
(that is, a Node to be built).  As part of figuring out what Node
should be built next, the actually target list may be altered,
along with a message describing the alteration.  The calling
interface can subclass Task and provide a concrete implementation
of this method to see those messages.
```

exc_clear(*self*)

```
Clears any recorded exception.

This also changes the "exception_raise" attribute to point
to the appropriate do-nothing method.
```

exc_info(*self*)

```
Returns info about a recorded exception.
```

exception_set(*self*, *exception*=False)

```
Records an exception to be raised at the appropriate time.

This also changes the "exception_raise" attribute to point
to the method that will, in fact
```

execute(*self*)

```
Called to execute the task.

This method is called from multiple threads in a parallel build,
so only do thread safe stuff here.  Do thread unsafe stuff in
prepare(), executed() or failed().
```

executed(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

executed_with_callbacks(*self*)

```
Called when the task has been successfully executed and
the Taskmaster instance wants to call the Node's callback
methods.

This may have been a do-nothing operation (to preserve build
order), so we must check the node's state before deciding whether
it was "built", in which case we call the appropriate Node method.
In any event, we always call "visited()", which will handle any
post-visit actions that must take place regardless of whether
or not the target was an actual built target or a source Node.
```

executed_without_callbacks(*self*)

```
Called when the task has been successfully executed
and the Taskmaster instance doesn't want to call
the Node's callback methods.
```

fail_continue(*self*)

```
Explicit continue-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

fail_stop(*self*)

```
Explicit stop-the-build failure.

This sets failure status on the target nodes and all of
their dependent parent nodes.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

failed(*self*)

```
Default action when a task fails:  stop the build.

Note: Although this function is normally invoked on nodes in
the executing state, it might also be invoked on up-to-date
nodes when using Configure().
```

get_target(*self*)

```
Fetch the target being built or updated by this task.
```

make_ready(*self*)

```
Marks all targets in a task ready for execution if any target
is not current.

This is the default behavior for building only what's necessary.
```

make_ready_all(*self*)

```
Marks all targets in a task ready for execution.

This is used when the interface needs every target Node to be
visited--the canonical example being the "scons -c" option.
```

make_ready_current(*self*)

```
Marks all targets in a task ready for execution if any target
is not current.

This is the default behavior for building only what's necessary.
```

postprocess(*self*)

```
Post-processes a task after it's been executed.

This examines all the targets just built (or not, we don't care
if the build was successful, or even if there was no build
because everything was up-to-date) to see if they have any
waiting parent Nodes, or Nodes waiting on a common side effect,
that can be put back on the candidates list.
```

prepare(*self*)

```
Called just before the task is executed.

This is mainly intended to give the target Nodes a chance to
unlink underlying files and make all necessary directories before
the Action is actually called to build the targets.
```

trace_message(*self*, *method*, *node*, *description*='node')

35.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

35.7 Class Taskmaster

object
└ **SCons.Taskmaster.Taskmaster**

```
The Taskmaster for walking the dependency DAG.
```

35.7.1 Methods

__init__(*self*, *targets*=[], *tasker*=False, *order*=False, *trace*=False)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

find_next_candidate(*self*)

```
Returns the next candidate Node for (potential) evaluation.

The candidate list (really a stack) initially consists of all of
the top-level (command line) targets provided when the Taskmaster
was initialized.  While we walk the DAG, visiting Nodes, all the
children that haven't finished processing get pushed on to the
candidate list.  Each child can then be popped and examined in
turn for whether *their* children are all up-to-date, in which
case a Task will be created for their actual evaluation and
potential building.

Here is where we also allow candidate Nodes to alter the list of
Nodes that should be examined.  This is used, for example, when
invoking SCons in a source directory.  A source directory Node can
return its corresponding build directory Node, essentially saying,
"Hey, you really need to build this thing over here instead."
```

no_next_candidate(*self*)

```
Stops Taskmaster processing by not returning a next candidate.

Note that we have to clean-up the Taskmaster candidate list
because the cycle detection depends on the fact all nodes have
been processed somehow.
```

trace_message(*self*, *message*)

trace_node(*self*, *node*)

next_task(*self*)

```
Returns the next task to be executed.

This simply asks for the next Node to be evaluated, and then wraps
it in the specific Task subclass with which we were initialized.
```

will_not_build(*self*, *nodes*, *node_func*=<function <lambda> at 0x873a3e4>)

```
Perform clean-up about nodes that will never be built. Invokes
a user defined function on all of these nodes (including all
of their parents).
```

stop(*self*)

Stops the current build completely.

cleanup(*self*)

Check for dependency cycles.

__delattr__(...)

x.__delattr__('name') <==> del x.name

__getattribute__(...)

x.__getattribute__('name') <==> x.name

__hash__(*x*)

hash(x)

__new__(*T*, *S*, ...)

Return Value

a new object with type S, a subtype of T

__reduce__(...)

helper for pickle

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

__str__(*x*)

str(x)

35.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

36 Module SCons.Util

```
SCons.Util

Various utility functions go here.
```

36.1 Functions

dictify(*keys*, *values*, *result*={})

rightmost_separator(*path*, *sep*)

containsAny(*str*, *set*)

```
Check whether sequence str contains ANY of the items in set.
```

containsAll(*str*, *set*)

```
Check whether sequence str contains ALL of the items in set.
```

containsOnly(*str*, *set*)

```
Check whether sequence str contains ONLY items in set.
```

splitext(*path*)

```
Same as os.path.splitext() but faster.
```

updrive(*path*)

```
Make the drive letter (if any) upper case.
This is useful because Windows is inconsitent on the case
of the drive letter, which can cause inconsistencies when
calculating command signatures.
```

get_environment_var(*varstr*)

```
Given a string, first determine if it looks like a reference
to a single environment variable, like "$FOO" or "${FOO}".
If so, return that variable with no decorations ("FOO").
If not, return None.
```

render_tree(*root*, *child_func*, *prune*=0, *margin*=[0], *visited*={})

```
Render a tree of nodes into an ASCII tree view.
root - the root node of the tree
child_func - the function called to get the children of a node
prune - don't visit the same node twice
margin - the format of the left margin to use for children of root.
   1 results in a pipe, and 0 results in no pipe.
visited - a dictionary of visited nodes in the current branch if not prune,
   or in the whole tree if prune.
```

IDX(*N*)

print_tree(*root*, *child_func*, *prune*=0, *showtags*=0, *margin*=[0], *visited*={})

```
Print a tree of nodes.  This is like render_tree, except it prints
lines directly instead of creating a string representation in memory,
so that huge trees can be printed.

root - the root node of the tree
child_func - the function called to get the children of a node
prune - don't visit the same node twice
showtags - print status information to the left of each node line
margin - the format of the left margin to use for children of root.
   1 results in a pipe, and 0 results in no pipe.
visited - a dictionary of visited nodes in the current branch if not prune,
   or in the whole tree if prune.
```

is_Dict(*obj*, *isinstance*=<built-in function isinstance>, *DictTypes*=DictTypes)

is_List(*obj*, *isinstance*=<built-in function isinstance>, *ListTypes*=list, UserList)

is_Sequence(*obj*, *isinstance*=<built-in function isinstance>, *SequenceTypes*=(<type 'list'>, <type 'tuple'>, <class UserList.UserList ...)

is_Tuple(*obj*, *isinstance*=<built-in function isinstance>, *tuple*=<type 'tuple'>)

is_String(*obj*, *isinstance*=<built-in function isinstance>, *StringTypes*=(<type 'str'>, <type 'unicode'>, <class UserString.UserSt...)

is_Scalar(*obj*, *isinstance*=<built-in function isinstance>, *StringTypes*=(<type 'str'>, <type 'unicode'>, <class UserString.UserSt..., *SequenceTypes*=(<type 'list'>, <type 'tuple'>, <class UserList.UserList ...)

do_flatten(*sequence*, *result*, *isinstance*=<built-in function isinstance>, *StringTypes*=(<type 'str'>, <type 'unicode'>, <class UserString.UserSt..., *SequenceTypes*=(<type 'list'>, <type 'tuple'>, <class UserList.UserList ...)

flatten(*obj*, *isinstance*=<built-in function isinstance>, *StringTypes*=(<type 'str'>, <type 'unicode'>, <class UserString.UserSt..., *SequenceTypes*=(<type 'list'>, <type 'tuple'>, <class UserList.UserList ..., *do_flatten*=<function do_flatten at 0x842209c>)

```
Flatten a sequence to a non-nested list.

Flatten() converts either a single scalar or a nested sequence
to a non-nested list. Note that flatten() considers strings
to be scalars instead of sequences like Python would.
```

flatten_sequence(*sequence*, *isinstance*=<built-in function isinstance>, *StringTypes*=(<type 'str'>, <type 'unicode'>, <class UserString.UserSt..., *SequenceTypes*=(<type 'list'>, <type 'tuple'>, <class UserList.UserList ..., *do_flatten*=<function do_flatten at 0x842209c>)

```
Flatten a sequence to a non-nested list.

Same as flatten(), but it does not handle the single scalar
case. This is slightly more efficient when one knows that
the sequence to flatten can not be a scalar.
```

to_String(*s*, *isinstance*=<built-in function isinstance>, *str*=<type 'str'>, *UserString*=<class UserString.UserString at 0x829bf2c>, *BaseStringTypes*=(<type 'str'>, <type 'unicode'>))

to_String_for_subst(*s*, *isinstance*=<built-in function isinstance>, *str*=<type 'str'>, *to_String*=<function to_String at 0x8422144>, *BaseStringTypes*=(<type 'str'>, <type 'unicode'>), *SequenceTypes*=(<type 'list'>, <type 'tuple'>, <class UserList.UserList ..., *UserString*=<class UserString.UserString at 0x829bf2c>)

to_String_for_signature(*obj*, *to_String_for_subst*=<function to_String_for_subst at 0x842217c>, *AttributeError*=<type 'exceptions.AttributeError'>)

semi_deepcopy(*x*)

RegGetValue(*root*, *key*)

RegOpenKeyEx(*root*, *key*)

WhereIs(*file*, *path*=False, *pathext*=False, *reject*=[])

PrependPath(*oldpath*, *newpath*, *sep*=':', *delete_existing*=1, *canonicalize*=False)

```
This prepends newpath elements to the given oldpath.  Will only
add any particular path once (leaving the first one it encounters
and ignoring the rest, to preserve path order), and will
os.path.normpath and os.path.normcase all paths to help assure
this.  This can also handle the case where the given old path
variable is a list instead of a string, in which case a list will
be returned instead of a string.

Example:
  Old Path: "/foo/bar:/foo"
  New Path: "/biz/boom:/foo"
  Result:   "/biz/boom:/foo:/foo/bar"

If delete_existing is 0, then adding a path that exists will
not move it to the beginning; it will stay where it is in the
list.

If canonicalize is not None, it is applied to each element of
newpath before use.
```

AppendPath(*oldpath*, *newpath*, *sep*=':', *delete_existing*=1, *canonicalize*=False)

```
This appends new path elements to the given old path.  Will
only add any particular path once (leaving the last one it
encounters and ignoring the rest, to preserve path order), and
will os.path.normpath and os.path.normcase all paths to help
assure this.  This can also handle the case where the given old
path variable is a list instead of a string, in which case a list
will be returned instead of a string.

Example:
  Old Path: "/foo/bar:/foo"
  New Path: "/biz/boom:/foo"
  Result:   "/foo/bar:/biz/boom:/foo"

If delete_existing is 0, then adding a path that exists
will not move it to the end; it will stay where it is in the list.

If canonicalize is not None, it is applied to each element of
newpath before use.
```

get_native_path(*path*)

```
Transforms an absolute path into a native path for the system.
Non-Cygwin version, just leave the path alone.
```

Split(*arg*)

case_sensitive_suffixes(*s1*, *s2*)

adjustixes(*fname*, *pre*, *suf*, *ensure_suffix*=False)

unique(*s*)

```
Return a list of the elements in s, but without duplicates.

For example, unique([1,2,3,1,2,3]) is some permutation of [1,2,3],
unique("abcabc") some permutation of ["a", "b", "c"], and
unique(([1, 2], [2, 3], [1, 2])) some permutation of
[[2, 3], [1, 2]].

For best speed, all sequence elements should be hashable.  Then
unique() will usually work in linear time.

If not possible, the sequence elements should enjoy a total
ordering, and if list(s).sort() doesn't raise TypeError it's
assumed that they do enjoy a total ordering.  Then unique() will
usually work in O(N*log2(N)) time.

If that's not possible either, the sequence elements must support
equality-testing.  Then unique() will usually work in quadratic
time.
```

uniquer(*seq*, *idfun*=False)

uniquer_hashables(*seq*)

make_path_relative(*path*)

```
makes an absolute path name to a relative pathname.
```

AddMethod(*obj*, *function*, *name*=False)

```
Adds either a bound method to an instance or an unbound method to
a class. If name is ommited the name of the specified function
is used by default.
Example:
  a = A()
  def f(self, x, y):
    self.z = x + y
  AddMethod(f, A, "add")
  a.add(2, 4)
  print a.z
  AddMethod(lambda self, i: self.l[i], a, "listIndex")
  print a.listIndex(5)
```

RenameFunction(*function*, *name*)

```
Returns a function identical to the specified function, but with
the specified name.
```

MD5signature(*s*)

MD5filesignature(*fname*, *chunksize*=65536)

MD5collect(*signatures*)

```
Collects a list of signatures into an aggregate signature.

signatures - a list of signatures
returns - the aggregate signature
```

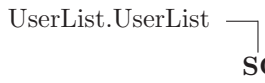
silent_intern(*x*)

```
Perform sys.intern() on the passed argument and return the result.
If the input is ineligible (e.g. a unicode string) the original argument is
returned and no exception is thrown.
```

36.2 Variables

Name	Description
DictTypes	**Value:** DictTypes
ListTypes	**Value:** list, UserList
SequenceTypes	**Value:** (<type 'list'>, <type 'tuple'>, <class UserList.UserList ...
StringTypes	**Value:** (<type 'str'>, <type 'unicode'>, <class UserString.UserSt...
BaseStringTypes	**Value:** (<type 'str'>, <type 'unicode'>)
d	**Value:** {<type 'instance'>: <function _semi_deepcopy_inst at 0x84...
can_read_reg	**Value:** 0
hkey_mod	**Value:** win32con
RegEnumKey	**Value:** win32api.RegEnumKey
RegEnumValue	**Value:** win32api.RegEnumValue
RegQueryValueEx	**Value:** win32api.RegQueryValueEx
HKEY_CLASSES_ROOT	**Value:** False
HKEY_LOCAL_MACHINE	**Value:** False
HKEY_CURRENT_USER	**Value:** False
HKEY_USERS	**Value:** False
display	**Value:** SCons.Util.display
md5	**Value:** True

36.3 Class NodeList




```
This class is almost exactly like a regular list of Nodes
(actually it can hold any object), with one important difference.
If you try to get an attribute from this list, it will return that
attribute from every item in the list.  For example:

>>> someList = NodeList([ '  foo  ', '  bar  ' ])
>>> someList.strip()
[ 'foo', 'bar' ]
```

36.3.1 Methods

__nonzero__(*self*)

__str__(*self*)

__iter__(*self*)

__call__(*self*, **args*, ***kwargs*)

__getattr__(*self*, *name*)

__add__(*self*, *other*)

__cmp__(*self*, *other*)

__contains__(*self*, *item*)

__delitem__(*self*, *i*)

__delslice__(*self*, *i*, *j*)

__eq__(*self*, *other*)

__ge__(*self*, *other*)

__getitem__(*self*, *i*)

__getslice__(*self*, *i*, *j*)

__gt__(*self*, *other*)

__iadd__(*self*, *other*)

__**imul**__(*self*, *n*)

__**init**__(*self*, *initlist*=`False`)

__**le**__(*self*, *other*)

__**len**__(*self*)

__**lt**__(*self*, *other*)

__**mul**__(*self*, *n*)

__**ne**__(*self*, *other*)

__**radd**__(*self*, *other*)

__**repr**__(*self*)

__**rmul**__(*self*, *n*)

__**setitem**__(*self*, *i*, *item*)

__**setslice**__(*self*, *i*, *j*, *other*)

append(*self*, *item*)

count(*self*, *item*)

extend(*self*, *other*)

index(*self*, *item*, **args*)

insert(*self*, *i*, *item*)

pop(*self*, *i*=`-1`)

remove(*self*, *item*)

reverse(*self*)

sort(*self*, **args*, ***kwds*)

36.4 Class DisplayEngine

object
└ **SCons.Util.DisplayEngine**

36.4.1 Methods

__call__(*self*, *text*, *append_newline*=1)

set_mode(*self*, *mode*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(x)
`str(x)`

36.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

36.4.3 Class Variables

Name	Description
print_it	**Value:** `True`

36.5 Class Proxy

object
└ **SCons.Util.Proxy**

Known Subclasses: SCons.Builder.CompositeBuilder, SCons.Node.FS.EntryProxy

```
A simple generic Proxy class, forwarding all calls to
subject.  So, for the benefit of the python newbie, what does
this really mean?  Well, it means that you can take an object, let's
call it 'objA', and wrap it in this Proxy class, with a statement
like this

             proxyObj = Proxy(objA),

Then, if in the future, you do something like this

             x = proxyObj.var1,

since Proxy does not have a 'var1' attribute (but presumably objA does),
the request actually is equivalent to saying

             x = objA.var1

Inherit from this class to create a Proxy.

Note that, with new-style classes, this does *not* work transparently
for Proxy subclasses that use special .__*__() method names, because
those names are now bound to the class, not the individual instances.
You now need to know in advance which .__*__() method names you want
to pass on to the underlying Proxy object, and specifically delegate
their calls like this:

    class Foo(Proxy):
```

```
__str__ = Delegate('__str__')
```

36.5.1 Methods

__init__(*self*, *subject*)

Wrap an object as a Proxy object

Overrides: object.__init__

__getattr__(*self*, *name*)

Retrieve an attribute from the wrapped object. If the named attribute doesn't exist, AttributeError is raised

get(*self*)

Retrieve the entire wrapped object

__cmp__(*self*, *other*)

__delattr__(...)

x.__delattr__('name') <==> del x.name

__getattribute__(...)

x.__getattribute__('name') <==> x.name

__hash__(*x*)

hash(x)

__new__(*T*, *S*, ...)

Return Value

a new object with type S, a subtype of T

__reduce__(...)

helper for pickle

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

__**setattr**__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__**str**__(*x*)

```
str(x)
```

36.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

36.6 Class Delegate

object
└ **SCons.Util.Delegate**

```
A Python Descriptor class that delegates attribute fetches
to an underlying wrapped subject of a Proxy.  Typical use:

    class Foo(Proxy):
        __str__ = Delegate('__str__')
```

36.6.1 Methods

__**init**__(*self*, *attribute*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__**get**__(*self*, *obj*, *cls*)

__**delattr**__(...)

```
x.__delattr__('name') <==> del x.name
```

__**getattribute**__(...)

```
x.__getattribute__('name') <==> x.name
```

__**hash**__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value
a new object with type S, a subtype of T

__reduce__(*...*)

helper for pickle

__reduce_ex__(*...*)

helper for pickle

__repr__(*x*)

repr(x)

__setattr__(*...*)

x.__setattr__('name', value) <==> x.name = value

__str__(*x*)

str(x)

36.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

36.7 Class _NoError

object
exceptions.BaseException
exceptions.Exception
SCons.Util._NoError

36.7.1 Methods

__delattr__(*...*)

x.__delattr__('name') <==> del x.name

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

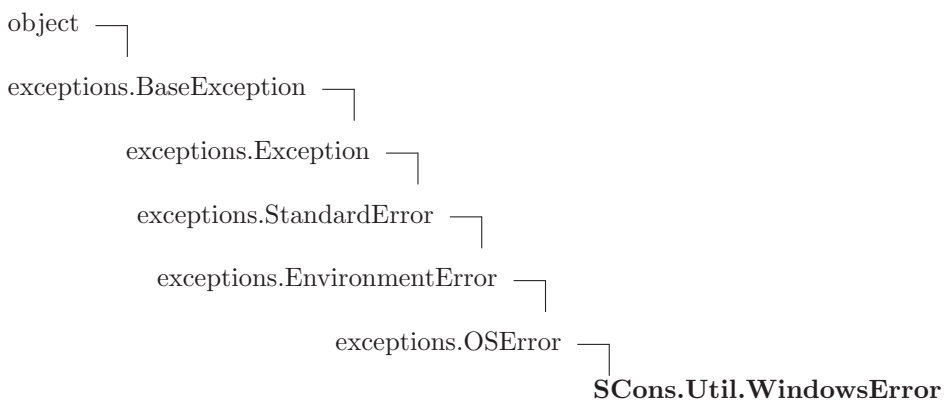
__setstate__(...)

__**str**__(*x*)
`str(x)`
Overrides: object.__str__

36.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

36.8 Class WindowsError



36.8.1 Methods

__**delattr**__(*...*)
`x.__delattr__('name') <==> del x.name`
Overrides: object.__delattr__

__**getattribute**__(*...*)
`x.__getattribute__('name') <==> x.name`
Overrides: object.__getattribute__

__**getitem**__(*x*, *y*)
`x[y]`

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.EnvironmentError.__init__

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.EnvironmentError.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: exceptions.BaseException.__reduce__

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

```
str(x)
```

Overrides: exceptions.BaseException.__str__

36.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
errno	**Value:** <member 'errno' of 'exceptions.EnvironmentError' objects>
filename	**Value:** <member 'filename' of 'exceptions.EnvironmentError' objects>
message	**Value:** <member 'message' of 'exceptions.EnvironmentError' objects>
strerror	**Value:** <member 'strerror' of 'exceptions.EnvironmentError' objects>

36.9 Class CLVar

UserList.UserList
└
SCons.Util.CLVar

```
A class for command-line construction variables.

This is a list that uses Split() to split an initial string along
white-space arguments, and similarly to split any strings that get
added.  This allows us to Do the Right Thing with Append() and
Prepend() (as well as straight Python foo = env['VAR'] + 'arg1
arg2') regardless of whether a user adds a list or a string to a
command-line construction variable.
```

36.9.1 Methods

__init__(*self*, *seq*=[])
Overrides: UserList.UserList.__init__

__add__(*self*, *other*)
Overrides: UserList.UserList.__add__

__radd__(*self*, *other*)
Overrides: UserList.UserList.__radd__

__coerce__(*self*, *other*)

__str__(*self*)

__cmp__(*self*, *other*)

__contains__(*self*, *item*)

__delitem__(*self*, *i*)

__**delslice**__(*self*, *i*, *j*)

__**eq**__(*self*, *other*)

__**ge**__(*self*, *other*)

__**getitem**__(*self*, *i*)

__**getslice**__(*self*, *i*, *j*)

__**gt**__(*self*, *other*)

__**iadd**__(*self*, *other*)

__**imul**__(*self*, *n*)

__**le**__(*self*, *other*)

__**len**__(*self*)

__**lt**__(*self*, *other*)

__**mul**__(*self*, *n*)

__**ne**__(*self*, *other*)

__**repr**__(*self*)

__**rmul**__(*self*, *n*)

__**setitem**__(*self*, *i*, *item*)

__**setslice**__(*self*, *i*, *j*, *other*)

append(*self*, *item*)

count(*self*, *item*)

extend(*self*, *other*)

index(*self*, *item*, **args*)

insert(*self*, *i*, *item*)

pop(*self*, *i*=-1)

remove(*self*, *item*)

reverse(*self*)

sort(*self*, **args*, ***kwds*)

36.10 Class OrderedDict

UserDict.UserDict
└ **SCons.Util.OrderedDict**

Known Subclasses: SCons.Util.Selector

36.10.1 Methods

__init__(*self*, *dict*=`False`)
Overrides: UserDict.UserDict.__init__

__delitem__(*self*, *key*)
Overrides: UserDict.UserDict.__delitem__

__setitem__(*self*, *key*, *item*)
Overrides: UserDict.UserDict.__setitem__

clear(*self*)
Overrides: UserDict.UserDict.clear

copy(*self*)
Overrides: UserDict.UserDict.copy

items(*self*)
Overrides: UserDict.UserDict.items

keys(*self*)
Overrides: UserDict.UserDict.keys

popitem(*self*)
Overrides: UserDict.UserDict.popitem

setdefault(*self*, *key*, *failobj*=`False`)
Overrides: UserDict.UserDict.setdefault

update(*self*, *dict*)
Overrides: UserDict.UserDict.update

values(*self*)
Overrides: UserDict.UserDict.values

__**cmp**__(*self*, *dict*)

__**contains**__(*self*, *key*)

__**getitem**__(*self*, *key*)

__**len**__(*self*)

__**repr**__(*self*)

fromkeys(*cls*, *iterable*, *value*=`False`)

get(*self*, *key*, *failobj*=`False`)

has_key(*self*, *key*)

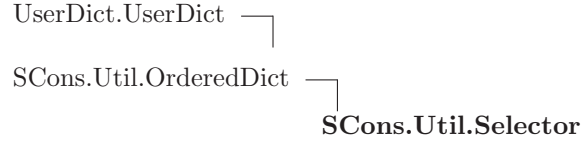
iteritems(*self*)

iterkeys(*self*)

itervalues(*self*)

pop(*self*, *key*, **args*)

36.11 Class Selector



Known Subclasses: SCons.Builder.CallableSelector, SCons.Builder.DictCmdGenerator, SCons.Builder.DictEmitter

```
A callable ordered dictionary that maps file suffixes to
dictionary values.  We preserve the order in which items are added
so that get_suffix() calls always return the first suffix added.
```

36.11.1 Methods

__**call**__(*self*, *env*, *source*, *ext*=`False`)

__**cmp**__(*self*, *dict*)

__**contains**__(*self*, *key*)

__**delitem**__(*self*, *key*)
Overrides: UserDict.UserDict.__delitem__

__**getitem**__(*self*, *key*)

__**init**__(*self*, *dict*=`False`)
Overrides: UserDict.UserDict.__init__

__**len**__(*self*)

__**repr**__(*self*)

__**setitem**__(*self*, *key*, *item*)
Overrides: UserDict.UserDict.__setitem__

clear(*self*)
Overrides: UserDict.UserDict.clear

copy(*self*)
Overrides: UserDict.UserDict.copy

fromkeys(*cls*, *iterable*, *value*=`False`)

get(*self*, *key*, *failobj*=`False`)

has_key(*self*, *key*)

items(*self*)
Overrides: UserDict.UserDict.items

iteritems(*self*)

iterkeys(*self*)

itervalues(*self*)

keys(*self*)
Overrides: UserDict.UserDict.keys

pop(*self*, *key*, **args*)

popitem(*self*)
Overrides: UserDict.UserDict.popitem

setdefault(*self*, *key*, *failobj*=`False`)
Overrides: UserDict.UserDict.setdefault

update(*self*, *dict*)
Overrides: UserDict.UserDict.update

values(*self*)
Overrides: UserDict.UserDict.values

36.12 Class LogicalLines

object
└ **SCons.Util.LogicalLines**

36.12.1 Methods

__init__(*self*, *fileobj*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

readline(*self*)

readlines(*self*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

36.12.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

36.13 Class UniqueList

UserList.UserList
└ **SCons.Util.UniqueList**

36.13.1 Methods

__init__(*self*, *seq*=[])
Overrides: UserList.UserList.__init__

__lt__(*self*, *other*)
Overrides: UserList.UserList.__lt__

__le__(*self*, *other*)
Overrides: UserList.UserList.__le__

__eq__(*self*, *other*)
Overrides: UserList.UserList.__eq__

__ne__(*self*, *other*)
Overrides: UserList.UserList.__ne__

__gt__(*self*, *other*)
Overrides: UserList.UserList.__gt__

__ge__(*self*, *other*)
Overrides: UserList.UserList.__ge__

__cmp__(*self*, *other*)
Overrides: UserList.UserList.__cmp__

__len__(*self*)
Overrides: UserList.UserList.__len__

__getitem__(*self*, *i*)
Overrides: UserList.UserList.__getitem__

__setitem__(*self*, *i*, *item*)
Overrides: UserList.UserList.__setitem__

__getslice__(*self*, *i*, *j*)
Overrides: UserList.UserList.__getslice__

__setslice__(*self*, *i*, *j*, *other*)
Overrides: UserList.UserList.__setslice__

__add__(*self*, *other*)
Overrides: UserList.UserList.__add__

__radd__(*self*, *other*)
Overrides: UserList.UserList.__radd__

__iadd__(*self*, *other*)
Overrides: UserList.UserList.__iadd__

__mul__(*self*, *other*)
Overrides: UserList.UserList.__mul__

__rmul__(*self*, *other*)
Overrides: UserList.UserList.__rmul__

__imul__(*self*, *other*)
Overrides: UserList.UserList.__imul__

append(*self*, *item*)
Overrides: UserList.UserList.append

insert(*self*, *i*)
Overrides: UserList.UserList.insert

count(*self*, *item*)
Overrides: UserList.UserList.count

index(*self*, *item*)
Overrides: UserList.UserList.index

reverse(*self*)
Overrides: UserList.UserList.reverse

sort(*self*, **args*, ***kwds*)
Overrides: UserList.UserList.sort

extend(*self*, *other*)
Overrides: UserList.UserList.extend

__contains__(*self*, *item*)

__delitem__(*self*, *i*)

__delslice__(*self*, *i*, *j*)

__repr__(*self*)

pop(*self*, *i*=-1)

remove(*self*, *item*)

36.14 Class Unbuffered

SCons.Util.Unbuffered

```
A proxy class that wraps a file object, flushing after every write,
and delegating everything else to the wrapped object.
```

36.14.1 Methods

__init__(*self*, *file*)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

write(*self*, *arg*)

__getattr__(*self*, *attr*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

helper for pickle

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

__str__(*x*)

str(x)

36.14.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

36.15 Class Null

object
└
SCons.Util.Null

Known Subclasses: SCons.Sig.MD5Null, SCons.Sig.TimeStampNull, SCons.Util.NullSeq

Null objects always and reliably "do nothing."

36.15.1 Methods

__new__(*cls*, **args*, ***kwargs*)

Return Value

a new object with type S, a subtype of T

Overrides: object.__new__ extit(inherited documentation)

__init__(*self*, **args*, ***kwargs*)

x.__init__(...) initializes x; see x.__class__.__doc__ for signature

Overrides: object.__init__ extit(inherited documentation)

__call__(*self*, **args*, ***kwargs*)

__**repr**__(*self*)
`repr(x)`

Overrides: object.__repr__ extit(inherited documentation)

__**nonzero**__(*self*)

__**getattr**__(*self*, *name*)

__**setattr**__(*self*, *name*, *value*)
`x.__setattr__('name', value) <==> x.name = value`

Overrides: object.__setattr__ extit(inherited documentation)

__**delattr**__(*self*, *name*)
`x.__delattr__('name') <==> del x.name`

Overrides: object.__delattr__ extit(inherited documentation)

__**getattribute**__(...)

`x.__getattribute__('name') <==> x.name`

__**hash**__(*x*)

`hash(x)`

__**reduce**__(...)

`helper for pickle`

__**reduce_ex**__(...)

`helper for pickle`

__**str**__(*x*)

`str(x)`

36.15.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

36.16 Class NullSeq

object
SCons.Util.Null
SCons.Util.NullSeq

Known Subclasses: SCons.Subst.NullNodeList

36.16.1 Methods

__**len**__(*self*)

__**iter**__(*self*)

__**getitem**__(*self*, *i*)

__**delitem**__(*self*, *i*)

__**setitem**__(*self*, *i*, *v*)

__**call**__(*self*, **args*, ***kwargs*)

__**delattr**__(*self*, *name*)
`x.__delattr__('name') <==> del x.name`
Overrides: object.__delattr__ extit(inherited documentation)

__**getattr**__(*self*, *name*)

__**getattribute**__(*...*)
`x.__getattribute__('name') <==> x.name`

__**hash**__(*x*)
`hash(x)`

__**init**__(*self*, **args*, ***kwargs*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

__**new**__(*cls*, **args*, ***kwargs*)

Return Value
`a new object with type S, a subtype of T`
Overrides: object.__new__ extit(inherited documentation)

__**nonzero**__(*self*)

__**reduce**__(...)

helper for pickle

__**reduce_ex**__(...)

helper for pickle

__**repr**__(*self*)
repr(x)

Overrides: object.__repr__ extit(inherited documentation)

__**setattr**__(*self*, *name*, *value*)
x.__setattr__('name', value) <==> x.name = value

Overrides: object.__setattr__ extit(inherited documentation)

__**str**__(*x*)

str(x)

36.16.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

37 Package SCons.Variables

engine.SCons.Variables

This file defines the Variables class that is used to add user-friendly customizable variables to an SCons build.

37.1 Modules

- **BoolVariable'**: engine.SCons.Variables.BoolVariable
  This file defines the option type for SCons implementing true/false values.
  (Section 38, p. 492)
- **EnumVariable'**: engine.SCons.Variables.EnumVariable
  This file defines the option type for SCons allowing only specified input-values.
  (Section 39, p. 493)
- **ListVariable'**: engine.SCons.Variables.ListVariable
  This file defines the option type for SCons implementing 'lists'.
  (Section 40, p. 494)
- **PackageVariable'**: engine.SCons.Variables.PackageVariable
  This file defines the option type for SCons implementing 'package activation'.
  (Section 41, p. 495)
- **PathVariable'**: SCons.Variables.PathVariable
  This file defines an option type for SCons implementing path settings.
  (Section 42, p. 496)

37.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Variables/__init__.py 5023 2010/06/14 2...

37.3 Class Variables

object
└ **SCons.Variables.Variables**

37.3.1 Methods

__init__(*self*, *files*=[], *args*={}, *is_global*=1)

files - [optional] List of option configuration files to load
(backward compatibility) If a single string is passed it is automatically placed in a file list

Overrides: object.__init__

keys(*self*)

```
Returns the keywords for the options
```

Add(*self*, *key*, *help*='', *default*=False, *validator*=False, *converter*=False, **kw*)

```
Add an option.

key - the name of the variable, or a list or tuple of arguments
help - optional help text for the options
default - optional default value
validator - optional function that is called to validate the option's value
            Called with (key, value, environment)
converter - optional function that is called to convert the option's value before
            putting it in the environment.
```

AddVariables(*self*, **optlist*)

```
Add a list of options.

Each list element is a tuple/list of arguments to be passed on
to the underlying method for adding options.

Example:
  opt.AddVariables(
    ('debug', '', 0),
    ('CC', 'The C compiler'),
    ('VALIDATE', 'An option for testing validation', 'notset',
     validator, None),
    )
```

Update(*self*, *env*, *args*=False)

```
Update an environment with the option variables.

env - the environment to update.
```

UnknownVariables(*self*)

```
Returns any options in the specified arguments lists that
were not known, declared options in this object.
```

Save(*self*, *filename*, *env*)

```
Saves all the options in the given file.  This file can
then be used to load the options next run.  This can be used
to create an option cache file.

filename - Name of the file to save into
env - the environment get the option values from
```

GenerateHelpText(*self*, *env*, *sort*=False)

```
Generate the help text for the options.

env - an environment that is used to get the current values
      of the options.
```

FormatVariableHelpText(*self*, *env*, *key*, *help*, *default*, *actual*, *aliases*=[])

__**delattr**__(...)

```
x.__delattr__('name') <==> del x.name
```

__**getattribute**__(...)

```
x.__getattribute__('name') <==> x.name
```

__**hash**__(*x*)

```
hash(x)
```

__**new**__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__**reduce**__(...)

```
helper for pickle
```

__**reduce_ex**__(...)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

37.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

37.3.3 Class Variables

Name	Description
instance	Holds all the options, updates the environment with the variables, and renders the help text. **Value:** False
format	**Value:** '\n%s: %s\n default: %s\n actual: %s\n'
format_	**Value:** '\n%s: %s\n default: %s\n actual: %s\n aliases: ...

38 Module SCons.Variables.BoolVariable'

```
engine.SCons.Variables.BoolVariable

This file defines the option type for SCons implementing true/false values.

Usage example:

  opts = Variables()
  opts.Add(BoolVariable('embedded', 'build for an embedded system', 0))
  ...
  if env['embedded'] == 1:
    ...
```

38.1 Functions

BoolVariable(*key*, *help*, *default*)

```
The input parameters describe a boolen option, thus they are
returned with the correct converter and validator appended. The
'help' text will by appended by '(yes|no) to show the valid
valued. The result is usable for input to opts.Add().
```

39 Module SCons.Variables.EnumVariable'

```
engine.SCons.Variables.EnumVariable

This file defines the option type for SCons allowing only specified
input-values.

Usage example:

  opts = Variables()
  opts.Add(EnumVariable('debug', 'debug output and symbols', 'no',
                        allowed_values=('yes', 'no', 'full'),
                        map={}, ignorecase=2))
  ...
  if env['debug'] == 'full':
    ...
```

39.1 Functions

EnumVariable(*key*, *help*, *default*, *allowed_values*, *map*={}, *ignorecase*=0)

```
The input parameters describe a option with only certain values
allowed. They are returned with an appropriate converter and
validator appended. The result is usable for input to
Variables.Add().

'key' and 'default' are the values to be passed on to Variables.Add().

'help' will be appended by the allowed values automatically

'allowed_values' is a list of strings, which are allowed as values
for this option.

The 'map'-dictionary may be used for converting the input value
into canonical values (eg. for aliases).

'ignorecase' defines the behaviour of the validator:

If ignorecase == 0, the validator/converter are case-sensitive.
If ignorecase == 1, the validator/converter are case-insensitive.
If ignorecase == 2, the validator/converter is case-insensitive and
                    the converted value will always be lower-case.

The 'validator' tests whether the value is in the list of allowed
values. The 'converter' converts input values according to the
given 'map'-dictionary (unmapped input values are returned
unchanged).
```

40 Module SCons.Variables.ListVariable'

```
engine.SCons.Variables.ListVariable

This file defines the option type for SCons implementing 'lists'.

A 'list' option may either be 'all', 'none' or a list of names
separated by comma. After the option has been processed, the option
value holds either the named list elements, all list elemens or no
list elements at all.

Usage example:

  list_of_libs = Split('x11 gl qt ical')

  opts = Variables()
  opts.Add(ListVariable('shared',
                        'libraries to build as shared libraries',
                        'all',
                        elems = list_of_libs))
  ...
  for lib in list_of_libs:
     if lib in env['shared']:
         env.SharedObject(...)
     else:
         env.Object(...)
```

40.1 Functions

ListVariable(*key*, *help*, *default*, *names*, *map*={})

```
The input parameters describe a 'package list' option, thus they
are returned with the correct converter and validater appended. The
result is usable for input to opts.Add() .

A 'package list' option may either be 'all', 'none' or a list of
package names (separated by space).
```

41 Module SCons.Variables.PackageVariable'

```
engine.SCons.Variables.PackageVariable

This file defines the option type for SCons implementing 'package
activation'.

To be used whenever a 'package' may be enabled/disabled and the
package path may be specified.

Usage example:

  Examples:
      x11=no   (disables X11 support)
      x11=yes  (will search for the package installation dir)
      x11=/usr/local/X11 (will check this path for existance)

  To replace autoconf's --with-xxx=yyy

  opts = Variables()
  opts.Add(PackageVariable('x11',
                           'use X11 installed here (yes = search some places',
                           'yes'))
  ...
  if env['x11'] == True:
      dir = ... search X11 in some standard places ...
      env['x11'] = dir
  if env['x11']:
      ... build with x11 ...
```

41.1 Functions

PackageVariable(*key*, *help*, *default*, *searchfunc*=`False`)

```
The input parameters describe a 'package list' option, thus they
are returned with the correct converter and validator appended. The
result is usable for input to opts.Add() .

A 'package list' option may either be 'all', 'none' or a list of
package names (seperated by space).
```

42 Module SCons.Variables.PathVariable'

```
SCons.Variables.PathVariable

This file defines an option type for SCons implementing path settings.

To be used whenever a a user-specified path override should be allowed.

Arguments to PathVariable are:
  option-name  = name of this option on the command line (e.g. "prefix")
  option-help  = help string for option
  option-dflt  = default value for this option
  validator    = [optional] validator for option value.  Predefined
                 validators are:

                     PathAccept -- accepts any path setting; no validation
                     PathIsDir  -- path must be an existing directory
                     PathIsDirCreate -- path must be a dir; will create
                     PathIsFile -- path must be a file
                     PathExists -- path must exist (any type) [default]

                 The validator is a function that is called and which
                 should return True or False to indicate if the path
                 is valid.  The arguments to the validator function
                 are: (key, val, env).  The key is the name of the
                 option, the val is the path specified for the option,
                 and the env is the env to which the Otions have been
                 added.

Usage example:

  Examples:
      prefix=/usr/local

  opts = Variables()

  opts = Variables()
  opts.Add(PathVariable('qtdir',
                        'where the root of Qt is installed',
                        qtdir, PathIsDir))
  opts.Add(PathVariable('qt_includes',
                        'where the Qt includes are installed',
                        '$qtdir/includes', PathIsDirCreate))
  opts.Add(PathVariable('qt_libraries',
                        'where the Qt library is installed',
                        '$qtdir/lib'))
```

42.1 Variables

Name	Description
PathVariable	**Value:** <SCons.Variables.PathVariable._PathVariableClass object a...

43 Module SCons.Warnings

```
SCons.Warnings

This file implements the warnings framework for SCons.
```

43.1 Functions

suppressWarningClass(*clazz*)

```
Suppresses all warnings that are of type clazz or
derived from clazz.
```

enableWarningClass(*clazz*)

```
Enables all warnings that are of type clazz or
derived from clazz.
```

warningAsException(*flag*=1)

```
Turn warnings into exceptions.  Returns the old value of the flag.
```

warn(*clazz*, **args*)

process_warn_strings(*arguments*)

```
Process string specifications of enabling/disabling warnings,
as passed to the --warn option or the SetOption('warn') function.


An argument to this option should be of the form <warning-class>
or no-<warning-class>.  The warning class is munged in order
to get an actual class name from the classes above, which we
need to pass to the {enable,disable}WarningClass() functions.
The supplied <warning-class> is split on hyphens, each element
is capitalized, then smushed back together.  Then the string
"Warning" is appended to get the class name.

For example, 'deprecated' will enable the DeprecatedWarning
class.  'no-dependency' will disable the DependencyWarning class.

As a special case, --warn=all and --warn=no-all will enable or
disable (respectively) the base Warning class of all warnings.
```

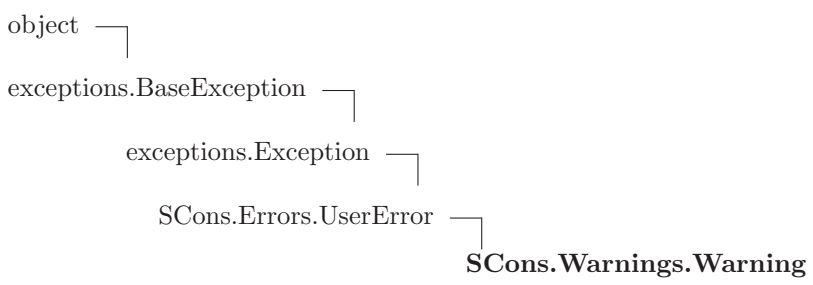
43.2 Variables

Name	Description
__revision__	**Value:** 'src/engine/SCons/Warnings.py 5023 2010/06/14 22:05:46 sc...

continued on next page

Name	Description

43.3 Class Warning



Known Subclasses: SCons.SConf.SConfWarning, SCons.Warnings.CacheWriteErrorWarning, SCons.Warnings.WarningOn
SCons.Warnings.DependencyWarning, SCons.Warnings.DeprecatedWarning, SCons.Warnings.FutureDeprecatedWarning,
SCons.Warnings.VisualStudioMissingWarning

43.3.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

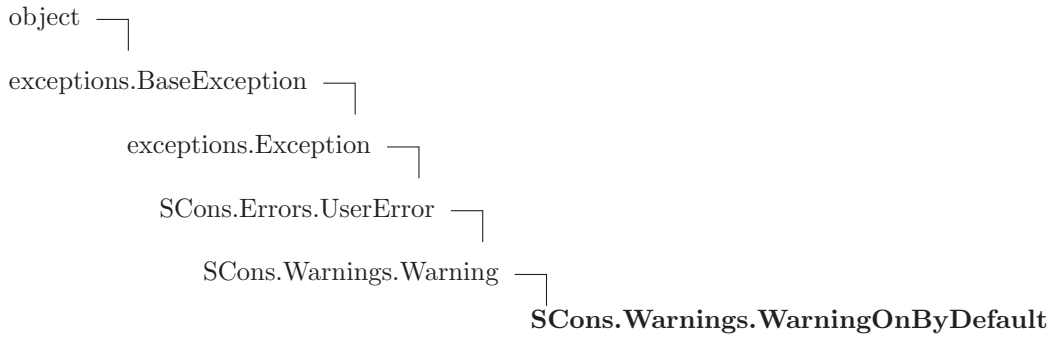
```
str(x)
```

Overrides: object.__str__

43.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.4 Class WarningOnByDefault



Known Subclasses: SCons.Warnings.CorruptSConsignWarning, SCons.Warnings.DuplicateEnvironmentWarning, SCons.Warnings.LinkWarning, SCons.Warnings.FutureReservedVariableWarning, SCons.Warnings.MisleadingKeywordsWarn SCons.Warnings.MissingSConscriptWarning, SCons.Warnings.NoMD5ModuleWarning, SCons.Warnings.NoMetaclassSuppor SCons.Warnings.NoObjectCountWarning, SCons.Warnings.NoParallelSupportWarning, SCons.Warnings.ReservedVariableW SCons.Warnings.StackSizeWarning, SCons.Warnings.VisualCMissingWarning, SCons.Warnings.VisualVersionMismatch

43.4.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

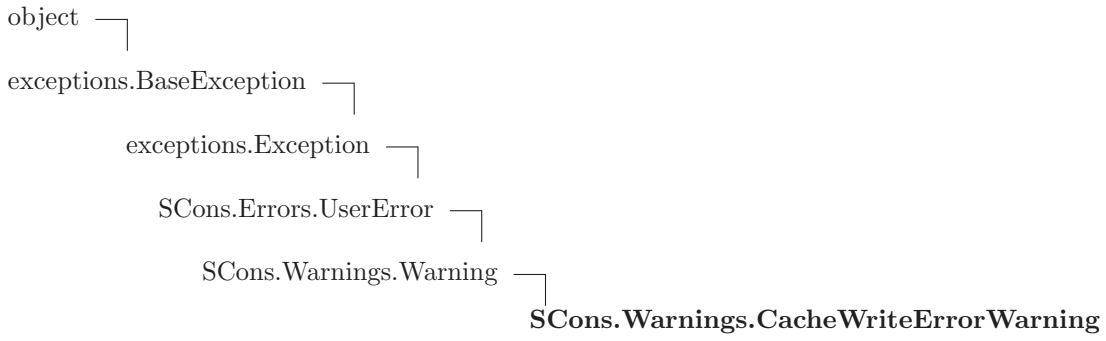
```
str(x)
```

Overrides: object.__str__

43.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.5 Class CacheWriteErrorWarning



43.5.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)
`helper for pickle`

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

`helper for pickle`

__repr__(*x*)

`repr(x)`

Overrides: object.__repr__

__setattr__(...)

`x.__setattr__('name', value) <==> x.name = value`

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

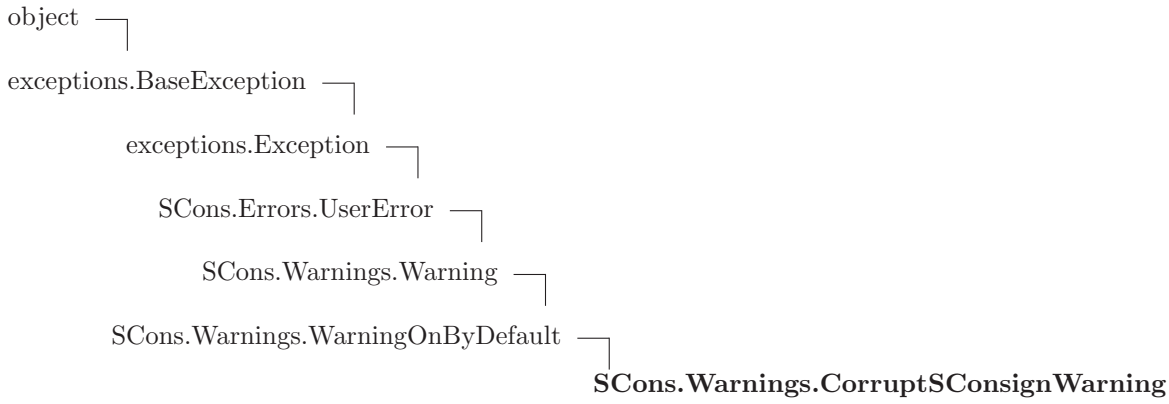
`str(x)`

Overrides: object.__str__

43.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.6 Class CorruptSConsignWarning



43.6.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

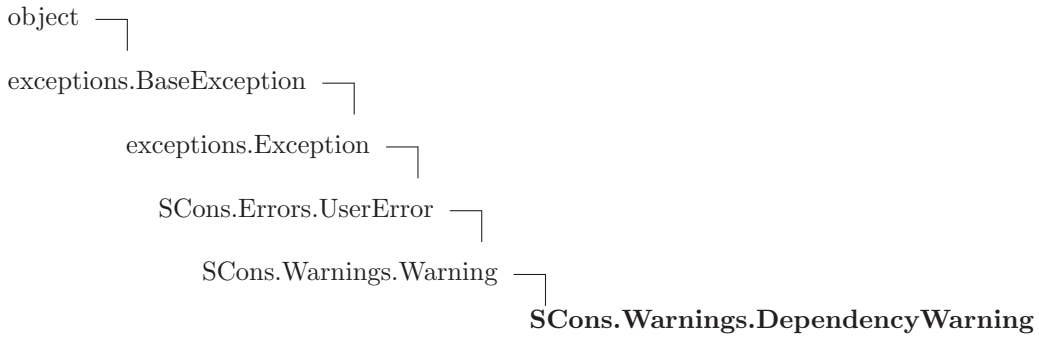
```
str(x)
```

Overrides: object.__str__

43.6.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.7 Class DependencyWarning



43.7.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)
helper for pickle

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

Overrides: object.__repr__

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

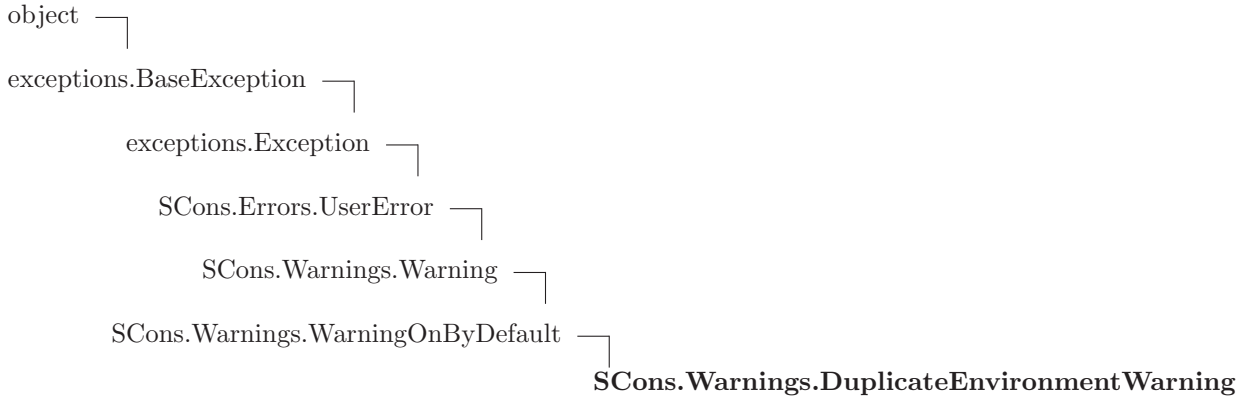
str(x)

Overrides: object.__str__

43.7.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.8 Class DuplicateEnvironmentWarning



43.8.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

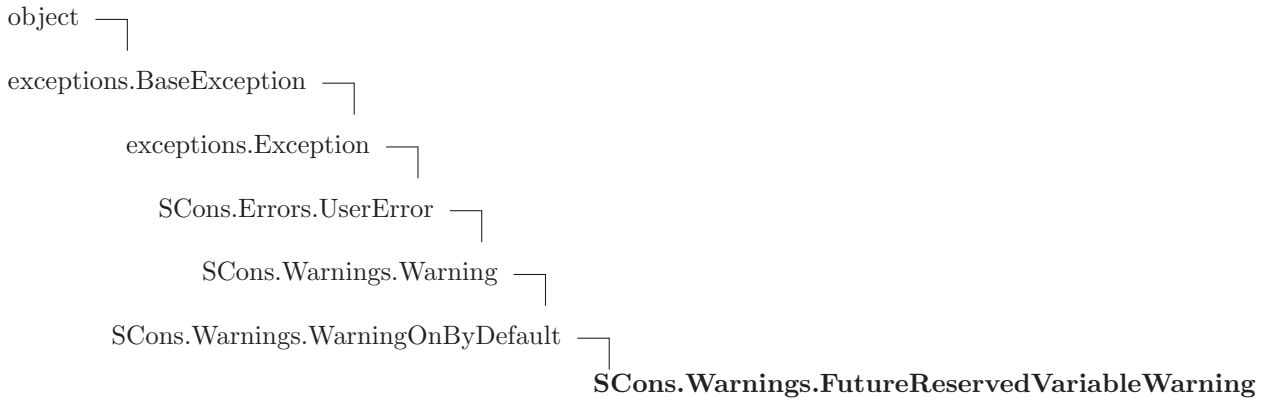
```
str(x)
```

Overrides: object.__str__

43.8.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.9 Class FutureReservedVariableWarning



43.9.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

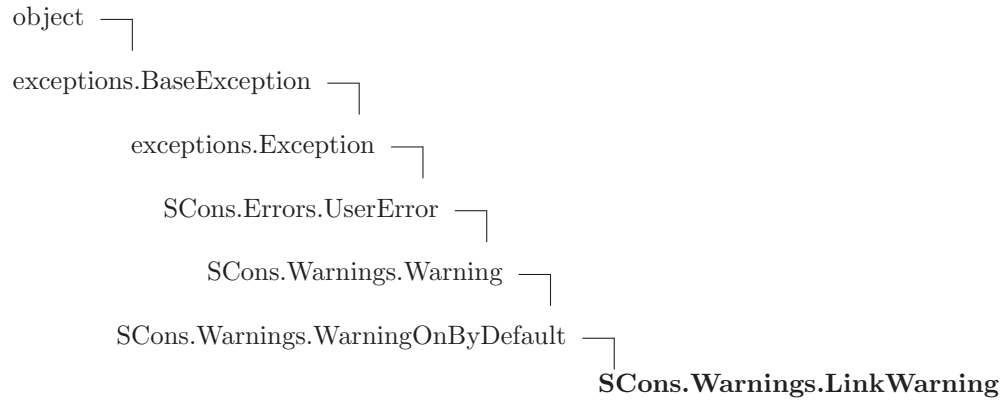
```
str(x)
```

Overrides: object.__str__

43.9.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.10 Class LinkWarning



Known Subclasses: SCons.Warnings.FortranCxxMixWarning

43.10.1 Methods

__delattr__(...)

`x.__delattr__('name') <==> del x.name`

Overrides: object.__delattr__

__getattribute__(...)

`x.__getattribute__('name') <==> x.name`

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

`x[y]`

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

`hash(x)`

__init__(...)

`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

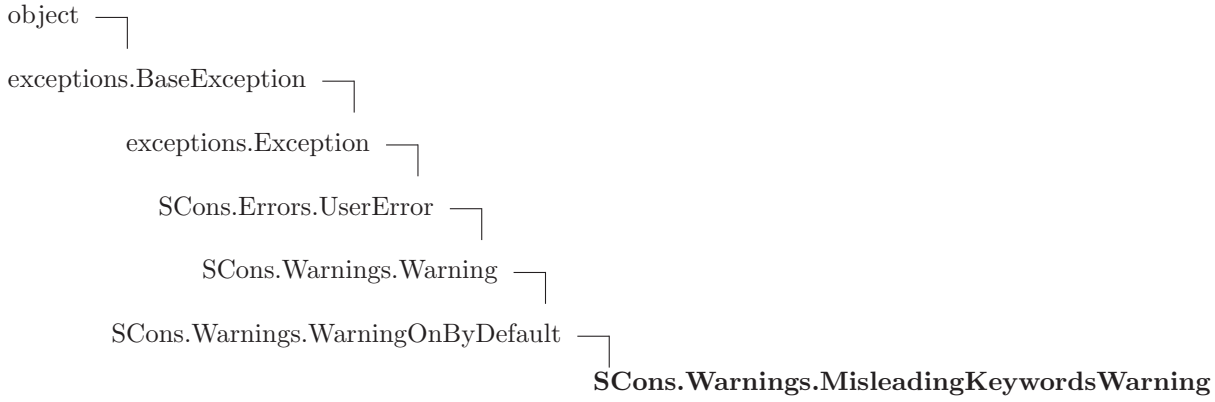
```
str(x)
```

Overrides: object.__str__

43.10.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.11 Class MisleadingKeywordsWarning



43.11.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(...)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(...)

__**str**__(*x*)

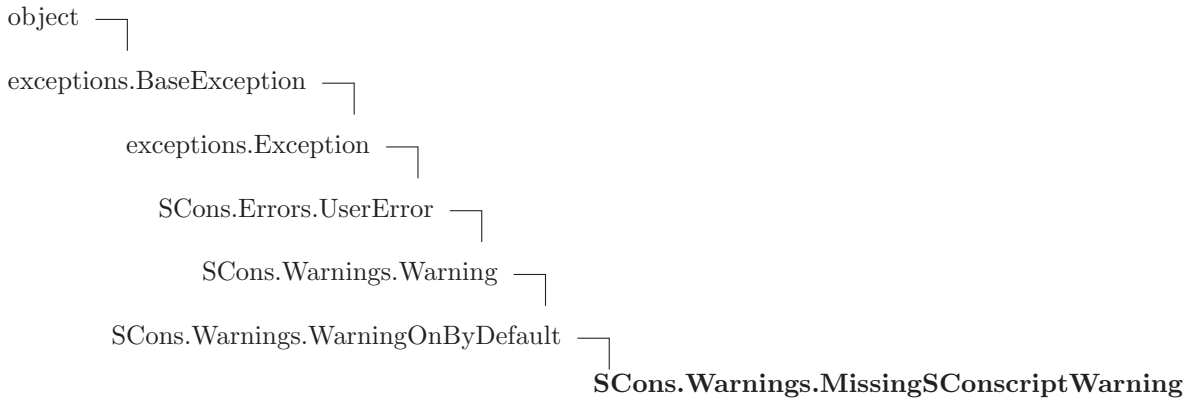
```
str(x)
```

Overrides: object.__str__

43.11.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.12 Class MissingSConscriptWarning



43.12.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(...)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(...)

__**str**__(*x*)

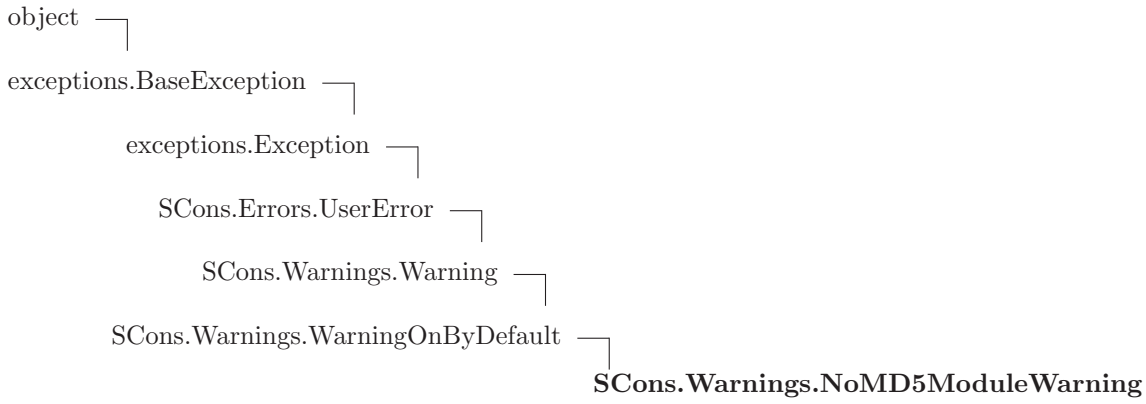
```
str(x)
```

Overrides: object.__str__

43.12.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.13 Class NoMD5ModuleWarning



43.13.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

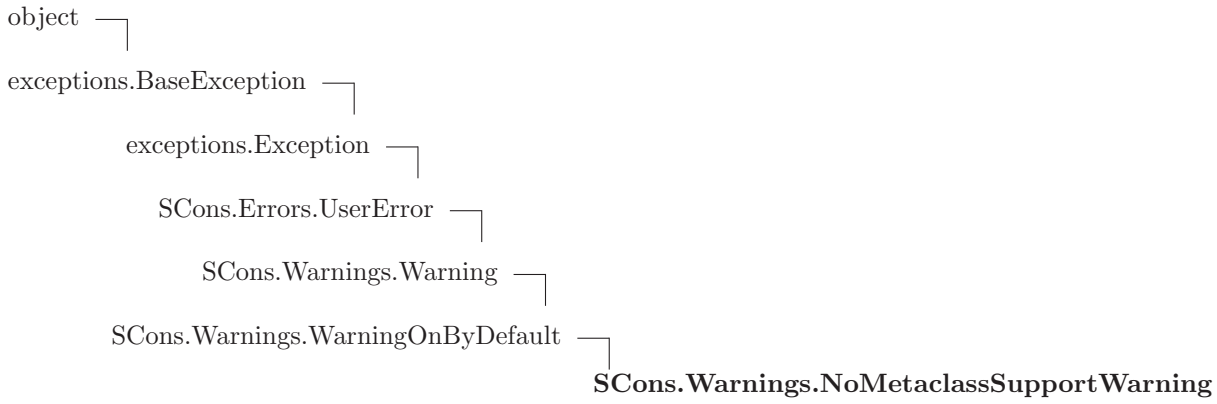
```
str(x)
```

Overrides: object.__str__

43.13.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.14 Class NoMetaclassSupportWarning



43.14.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

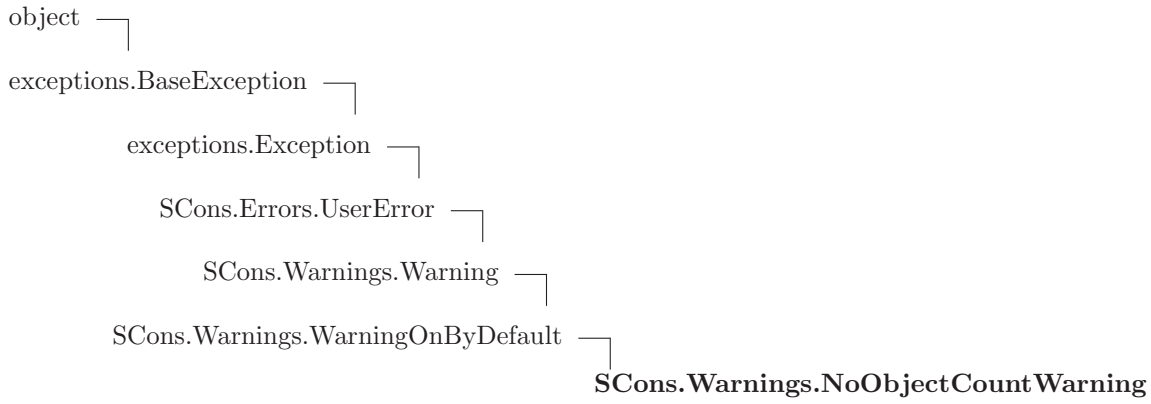
```
str(x)
```

Overrides: object.__str__

43.14.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.15 Class NoObjectCountWarning



43.15.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

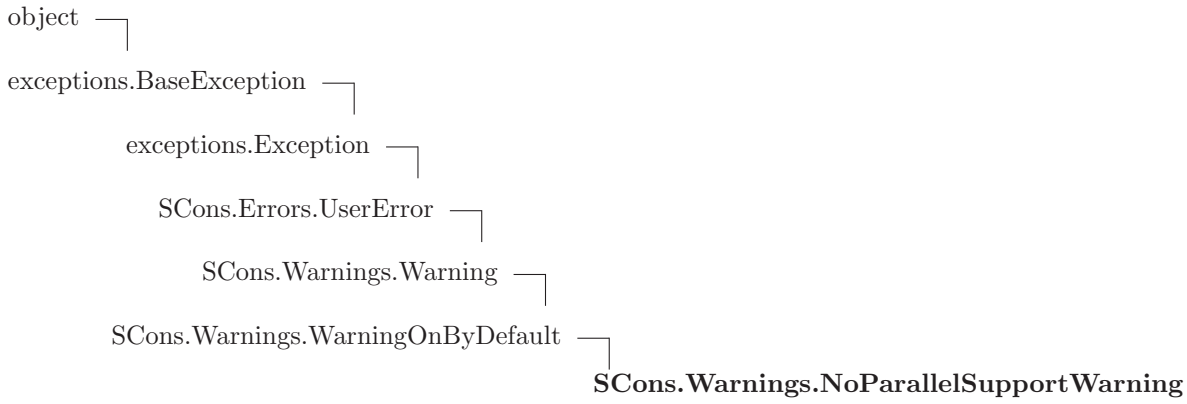
```
str(x)
```

Overrides: object.__str__

43.15.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.16 Class NoParallelSupportWarning



43.16.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

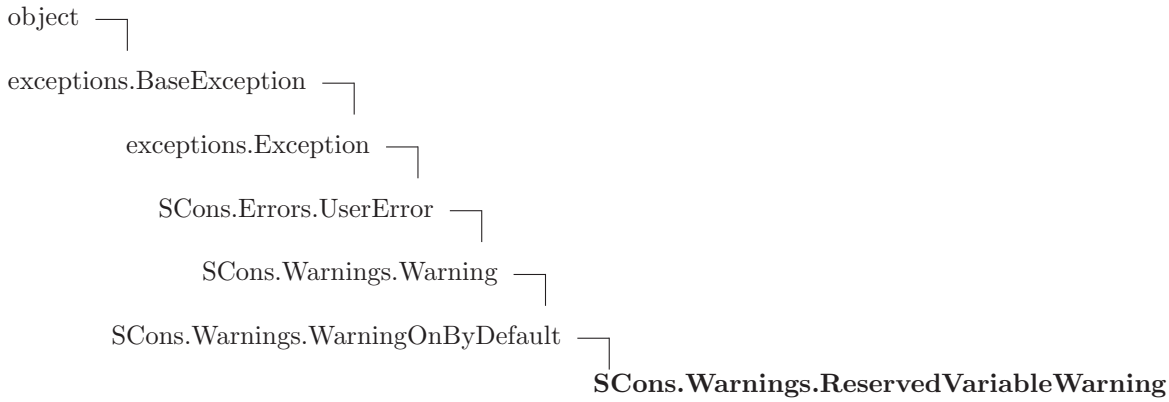
```
str(x)
```

Overrides: object.__str__

43.16.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.17 Class ReservedVariableWarning



43.17.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(...)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(...)

__**str**__(*x*)

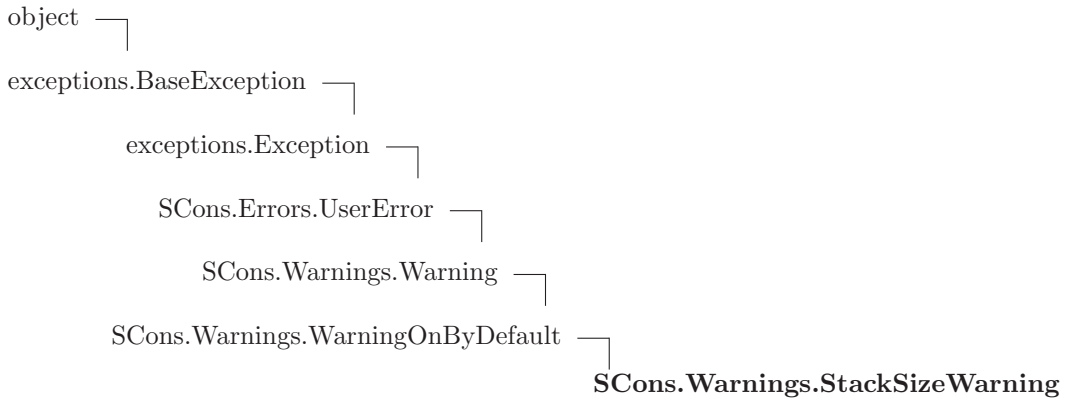
```
str(x)
```

Overrides: object.__str__

43.17.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.18 Class StackSizeWarning



43.18.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(...)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(...)

__**str**__(*x*)

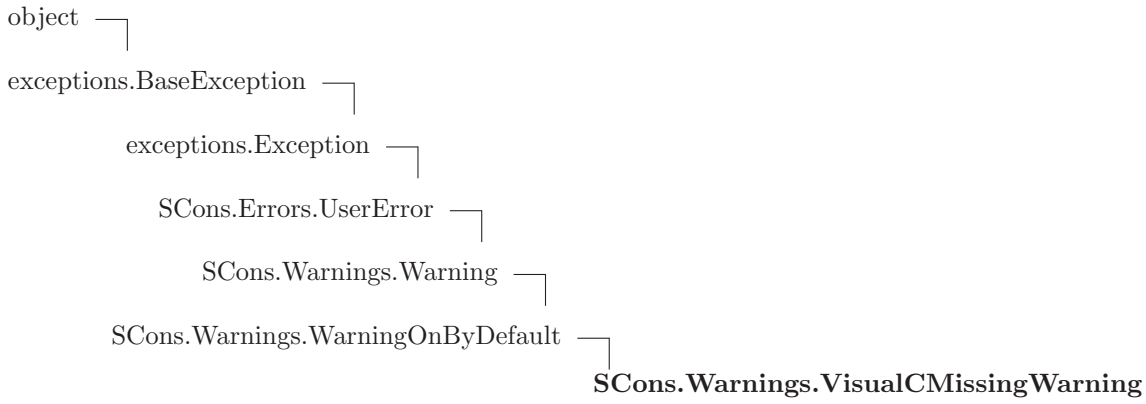
```
str(x)
```

Overrides: object.__str__

43.18.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.19 Class VisualCMissingWarning



43.19.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

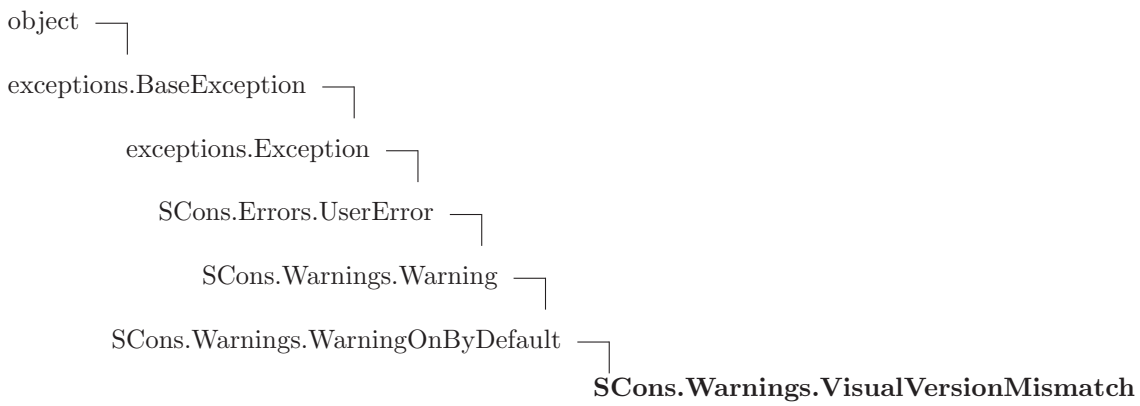
```
str(x)
```

Overrides: object.__str__

43.19.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.20 Class VisualVersionMismatch



43.20.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

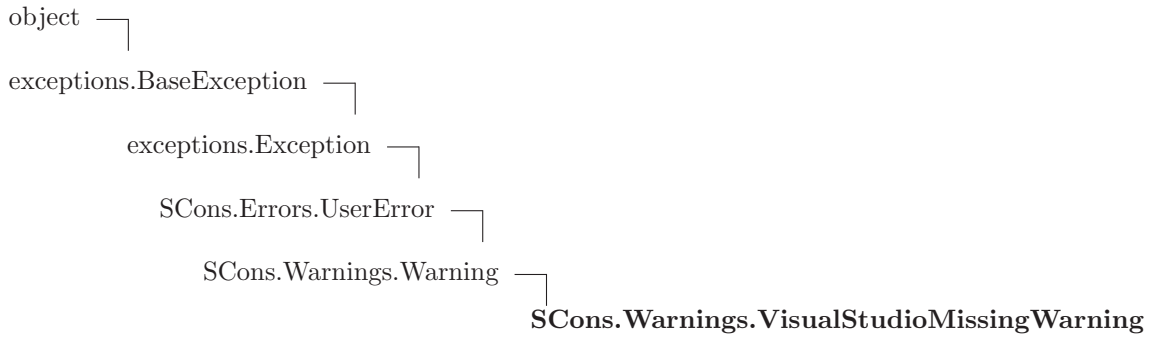
```
str(x)
```

Overrides: object.__str__

43.20.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.21 Class VisualStudioMissingWarning



43.21.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)
helper for pickle

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

helper for pickle

__repr__(*x*)

repr(x)

Overrides: object.__repr__

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

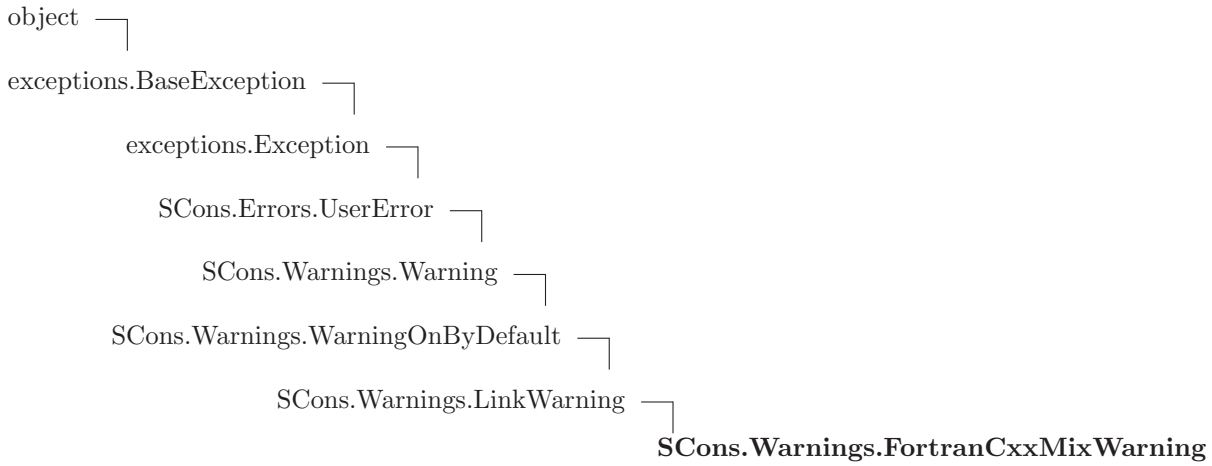
str(x)

Overrides: object.__str__

43.21.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.22 Class FortranCxxMixWarning



43.22.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(...)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(...)

__**str**__(*x*)

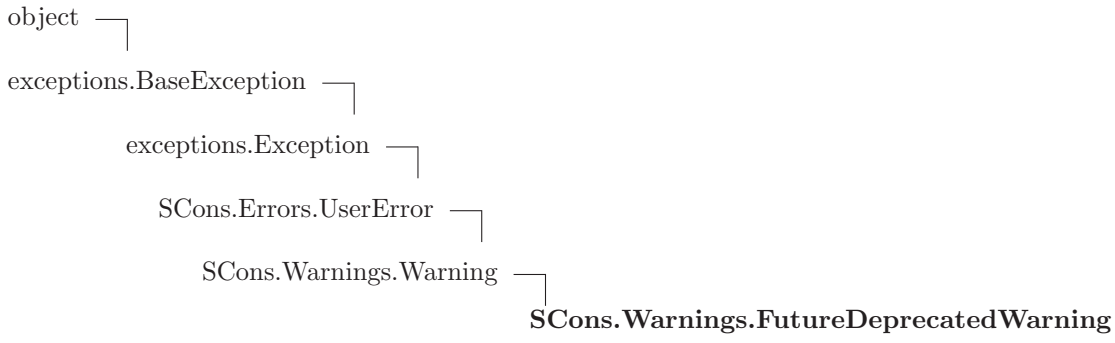
```
str(x)
```

Overrides: object.__str__

43.22.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.23 Class FutureDeprecatedWarning



Known Subclasses: SCons.Warnings.DeprecatedSourceCodeWarning

43.23.1 Methods

__delattr__(...)

`x.__delattr__('name') <==> del x.name`

Overrides: object.__delattr__

__getattribute__(...)

`x.__getattribute__('name') <==> x.name`

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

`x[y]`

__getslice__(*x*, *i*, *j*)

`x[i:j]`

`Use of negative indices is not supported.`

__hash__(*x*)

`hash(x)`

__init__(...)

`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

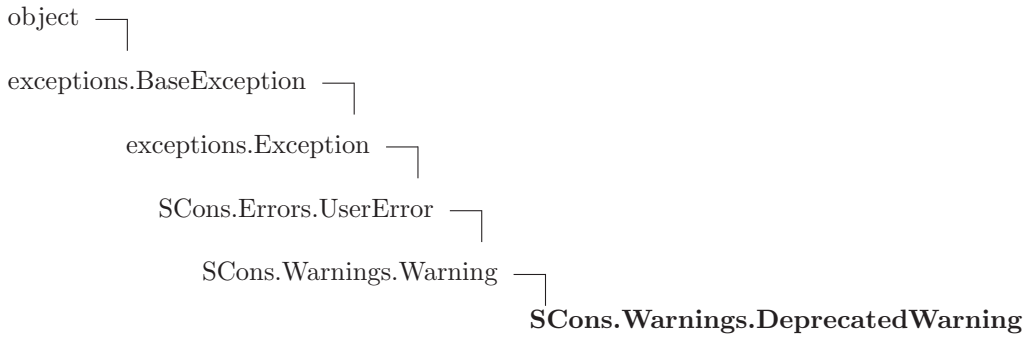
```
str(x)
```

Overrides: object.__str__

43.23.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.24 Class DeprecatedWarning



Known Subclasses: SCons.Warnings.DeprecatedBuildDirWarning, SCons.Warnings.MandatoryDeprecatedWarning, SCons.Warnings.PythonVersionWarning, SCons.Warnings.TaskmasterNeedsExecuteWarning

43.24.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

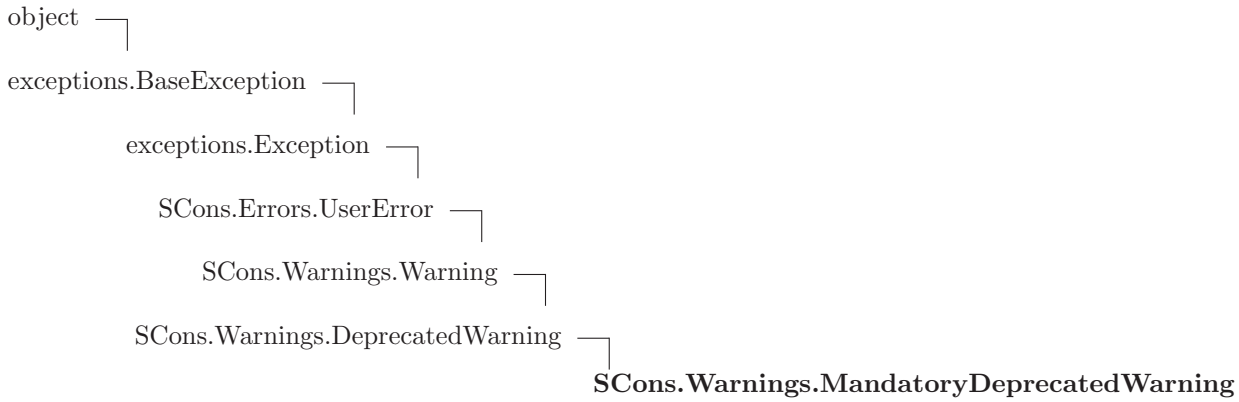
```
str(x)
```

Overrides: object.__str__

43.24.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.25 Class MandatoryDeprecatedWarning



Known Subclasses: SCons.Warnings.DeprecatedBuilderKeywordsWarning, SCons.Warnings.DeprecatedCopyWarning, SCons.Warnings.DeprecatedDebugOptionsWarning, SCons.Warnings.DeprecatedOptionsWarning, SCons.Warnings.Deprecat SCons.Warnings.DeprecatedSourceSignaturesWarning, SCons.Warnings.DeprecatedTargetSignaturesWarning

43.25.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

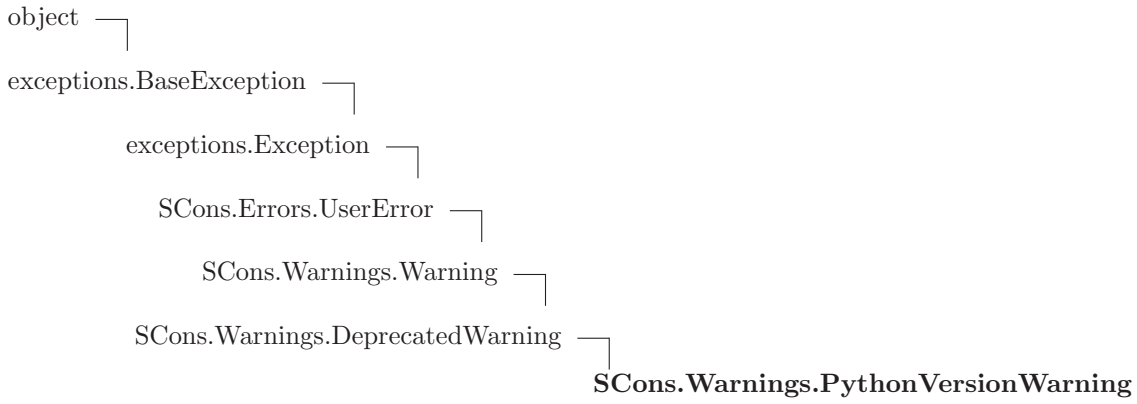
```
str(x)
```

Overrides: object.__str__

43.25.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.26 Class PythonVersionWarning



43.26.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(...)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(...)

__**str**__(*x*)

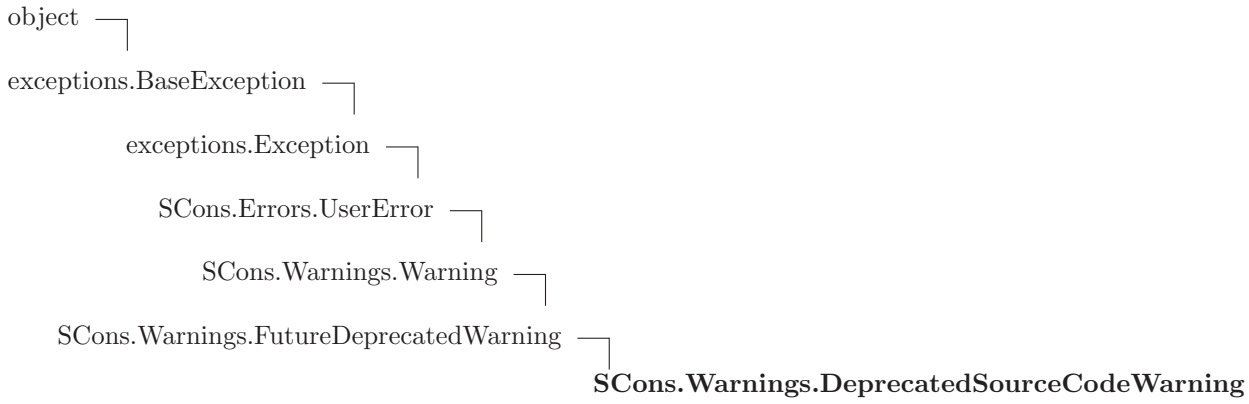
```
str(x)
```

Overrides: object.__str__

43.26.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.27 Class DeprecatedSourceCodeWarning



43.27.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

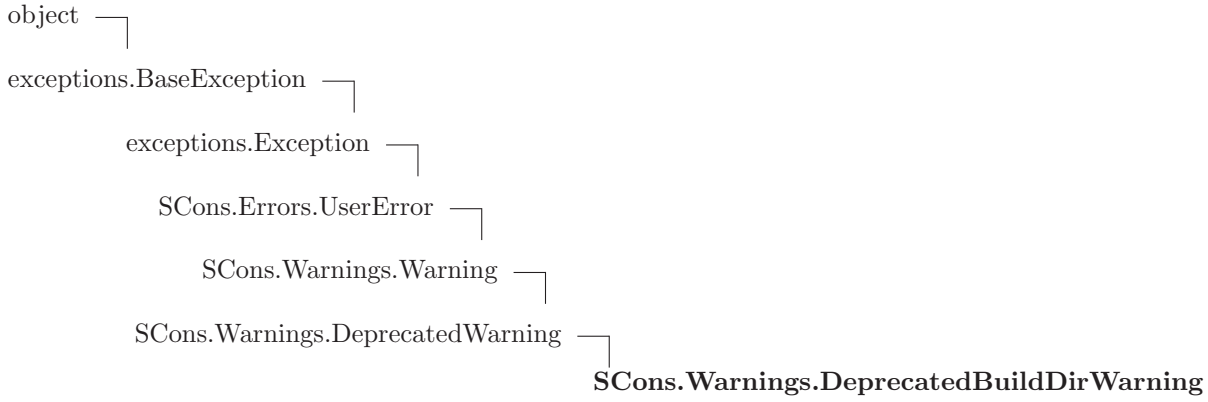
```
str(x)
```

Overrides: object.__str__

43.27.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.28 Class DeprecatedBuildDirWarning



43.28.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

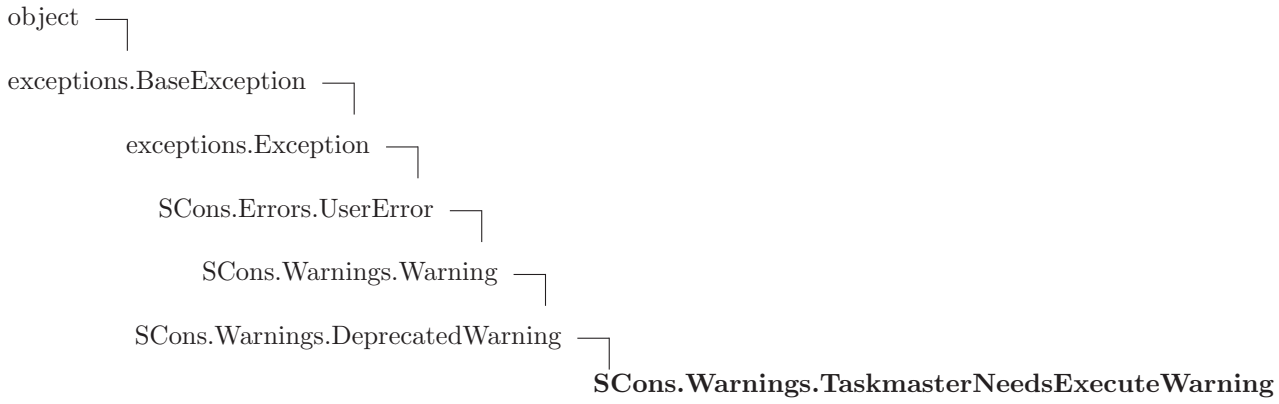
```
str(x)
```

Overrides: object.__str__

43.28.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.29 Class TaskmasterNeedsExecuteWarning



43.29.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

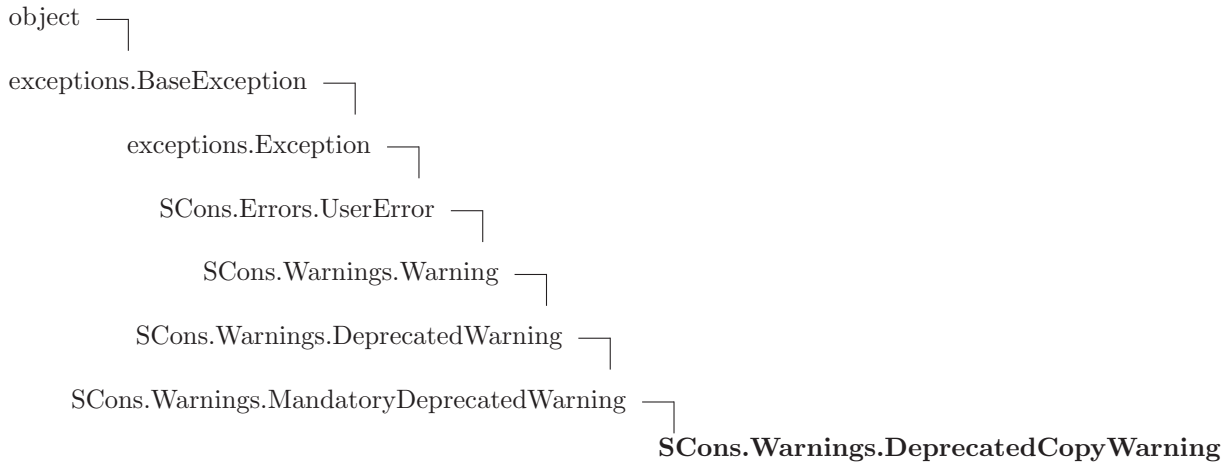
```
str(x)
```

Overrides: object.__str__

43.29.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.30 Class DeprecatedCopyWarning



43.30.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

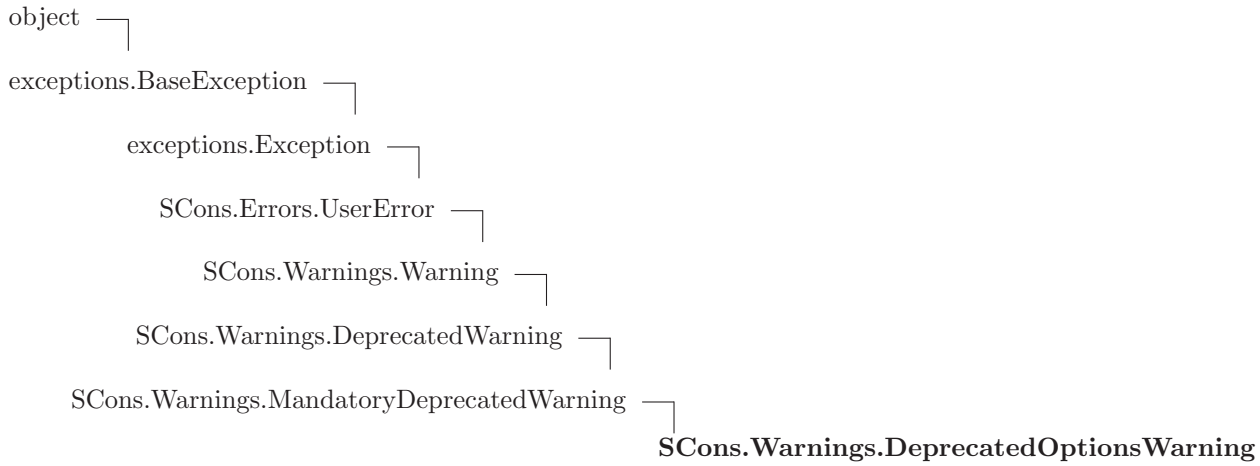
```
str(x)
```

Overrides: object.__str__

43.30.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.31 Class DeprecatedOptionsWarning



43.31.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

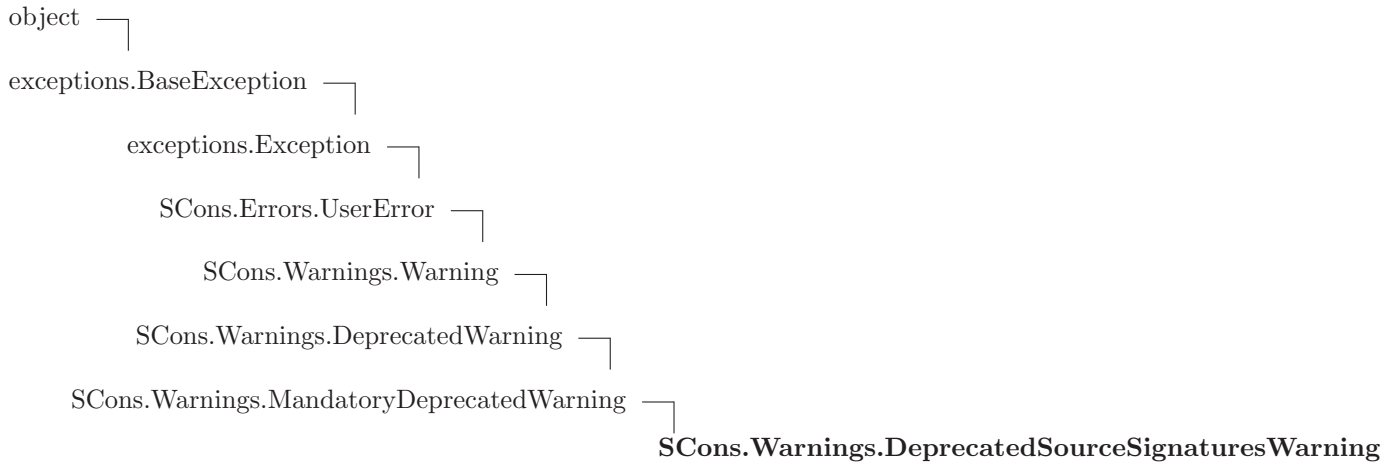
```
str(x)
```

Overrides: object.__str__

43.31.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.32 Class DeprecatedSourceSignaturesWarning



43.32.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(...)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(...)

__**str**__(*x*)

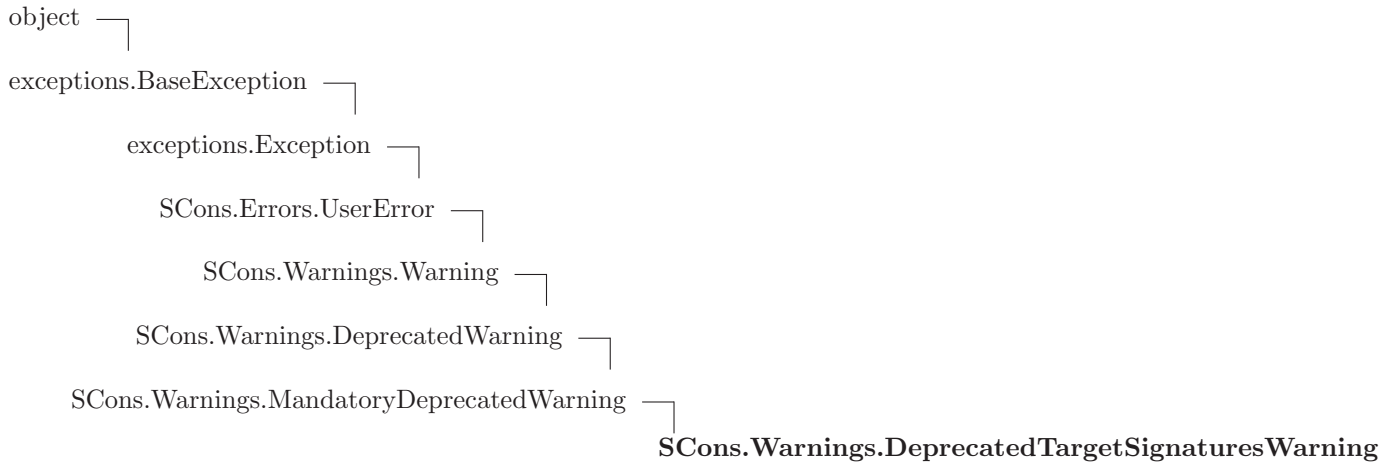
```
str(x)
```

Overrides: object.__str__

43.32.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.33 Class DeprecatedTargetSignaturesWarning



43.33.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(...)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(...)

__**str**__(*x*)

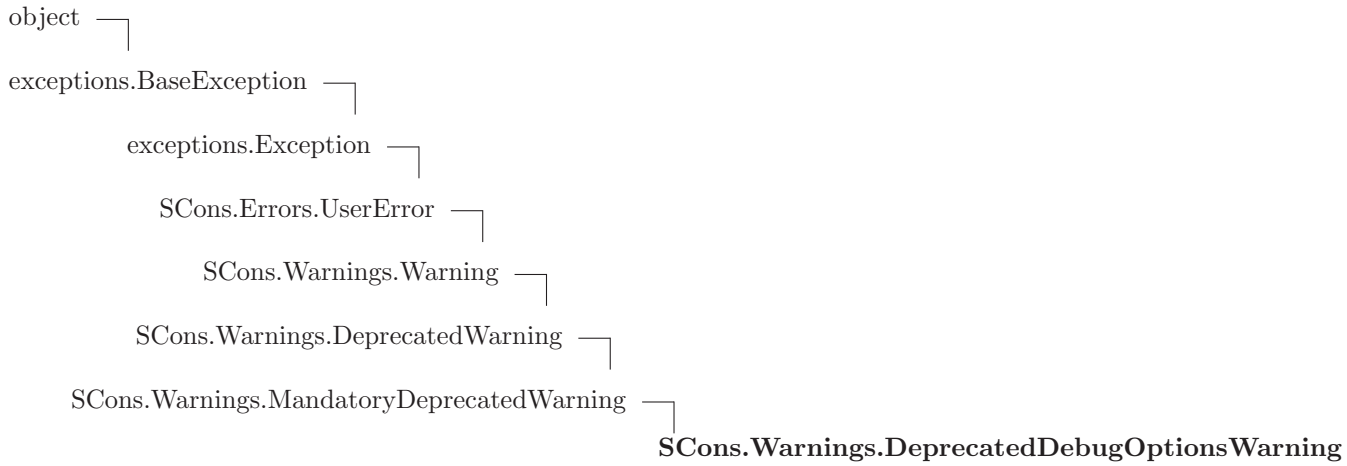
```
str(x)
```

Overrides: object.__str__

43.33.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.34 Class DeprecatedDebugOptionsWarning



43.34.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(...)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(...)

__**str**__(*x*)

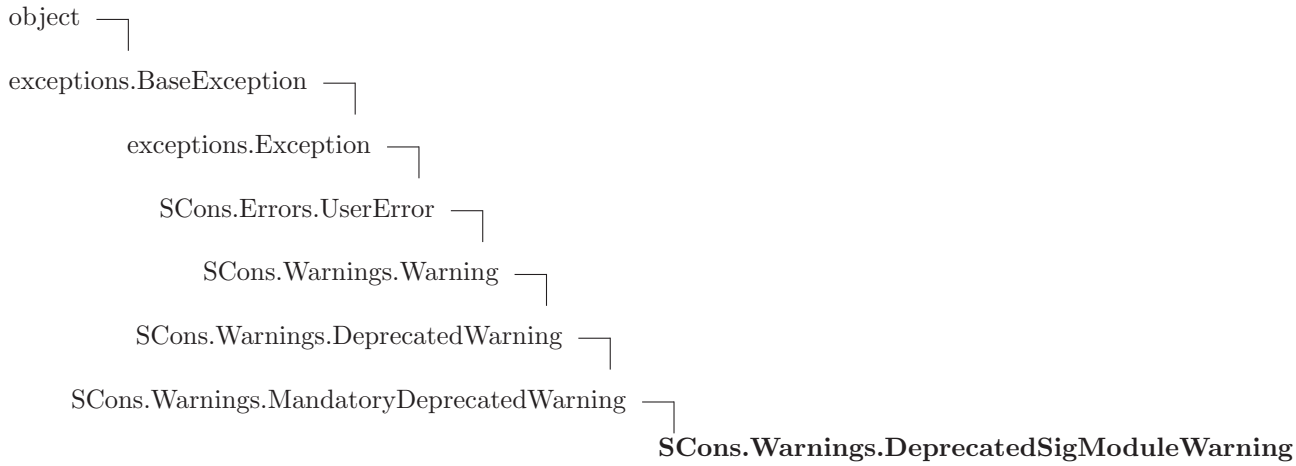
```
str(x)
```

Overrides: object.__str__

43.34.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.35 Class DeprecatedSigModuleWarning



43.35.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__**new**__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__**reduce**__(*...*)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__**reduce_ex**__(*...*)

```
helper for pickle
```

__**repr**__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__**setattr**__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__**setstate**__(*...*)

__**str**__(*x*)

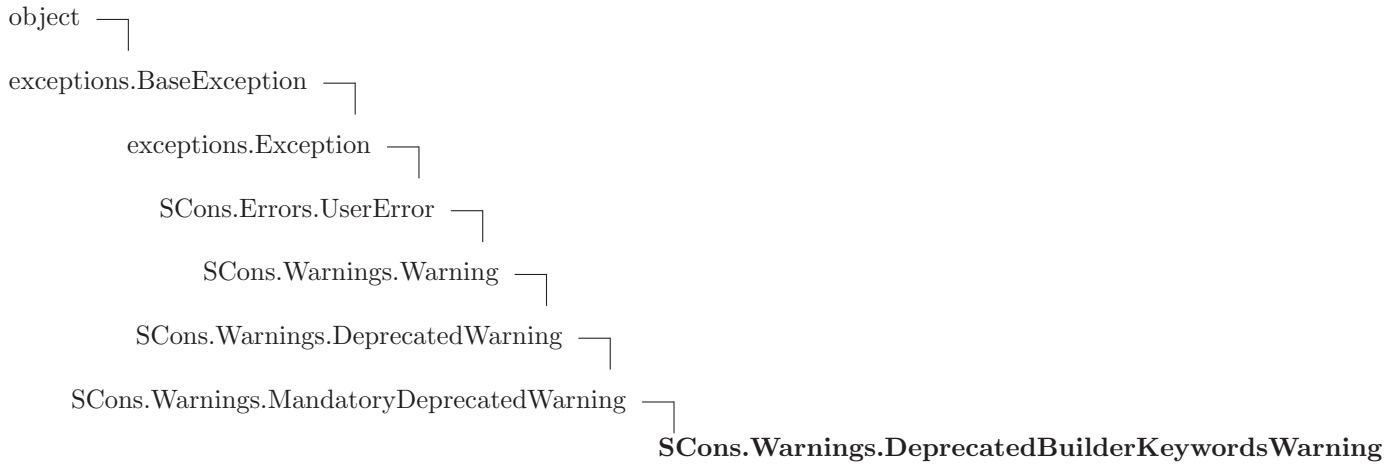
```
str(x)
```

Overrides: object.__str__

43.35.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

43.36 Class DeprecatedBuilderKeywordsWarning



43.36.1 Methods

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

```
str(x)
```

Overrides: object.__str__

43.36.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

44 Package SCons.compat

```
SCons compatibility package for old Python versions

This subpackage holds modules that provide backwards-compatible
implementations of various things that we'd like to use in SCons but which
only show up in later versions of Python than the early, old version(s)
we still support.

Other code will not generally reference things in this package through
the SCons.compat namespace.  The modules included here add things to
the builtins namespace or the global module list so that the rest
of our code can use the objects and names imported here regardless of
Python version.

Simply enough, things that go in the builtins name space come from
our _scons_builtins module.

The rest of the things here will be in individual compatibility modules
that are either: 1) suitably modified copies of the future modules that
we want to use; or 2) backwards compatible re-implementations of the
specific portions of a future module's API that we want to use.

GENERAL WARNINGS:  Implementations of functions in the SCons.compat
modules are *NOT* guaranteed to be fully compliant with these functions in
later versions of Python.  We are only concerned with adding functionality
that we actually use in SCons, so be wary if you lift this code for
other uses.  (That said, making these more nearly the same as later,
official versions is still a desirable goal, we just don't need to be
obsessive about it.)

We name the compatibility modules with an initial '_scons_' (for example,
_scons_subprocess.py is our compatibility module for subprocess) so
that we can still try to import the real module name and fall back to
our compatibility module if we get an ImportError.  The import_as()
function defined below loads the module as the "real" name (without the
'_scons'), after which all of the "import {module}" statements in the
rest of our code will find our pre-loaded compatibility module.
```

44.1 Modules

- **_scons_builtins**: Compatibility idioms for builtins names
  This module adds names to the builtins module for things that we want to use in SCons but which don't show up until later Python versions than the earliest ones we support.
  (Section 45, p. 569)
- **_scons_collections**: collections compatibility module for older (pre-2.4) Python versions
  This does not not NOT (repeat, *NOT*) provide complete collections functionality.
  (Section 46, p. 572)
- **_scons_dbm**: dbm compatibility module for Python versions that don't have dbm.
  (Section 47, p. 573)

- **_scons_hashlib**: hashlib backwards-compatibility module for older (pre-2.5) Python versions
  This does not not NOT (repeat, *NOT*) provide complete hashlib functionality.
  (Section 48, p. 576)
- **_scons_io**: io compatibility module for older (pre-2.6) Python versions
  This does not not NOT (repeat, *NOT*) provide complete io functionality.
  (Section 49, p. 580)
- **_scons_sets**: Classes to represent arbitrary sets (including sets of sets).
  (Section 50, p. 581)
- **_scons_subprocess**: subprocess - Subprocesses with accessible I/O streams
  This module allows you to spawn processes, connect to their input/output/error pipes, and obtain their return codes.
  (Section 51, p. 594)

44.2 Functions

import_as(*module*, *name*)

```
Imports the specified module (from our local directory) as the
specified name, returning the loaded module object.
```

rename_module(*new*, *old*)

```
Attempts to import the old module and load it under the new name.
Used for purely cosmetic name changes in Python 3.x.
```

lexists(*path*)

44.3 Variables

Name	Description
__doc__	**Value:** `...`
__revision__	**Value:** `'src/engine/SCons/compat/__init__.py 5023 2010/06/14 22:0...`

45 Module SCons.compat._scons_builtins

```
Compatibility idioms for builtins names

This module adds names to the builtins module for things that we want
to use in SCons but which don't show up until later Python versions than
the earliest ones we support.

This module checks for the following builtins names:

        all()
        any()
        sorted()
        memoryview()

Implementations of functions are *NOT* guaranteed to be fully compliant
with these functions in later versions of Python.  We are only concerned
with adding functionality that we actually use in SCons, so be wary
if you lift this code for other uses.  (That said, making these more
nearly the same as later, official versions is still a desirable goal,
we just don't need to be obsessive about it.)

If you're looking at this with pydoc and various names don't show up in
the FUNCTIONS or DATA output, that means those names are already built in
to this version of Python and we don't need to add them from this module.
```

45.1 Functions

all(*iterable*)

```
Returns True if all elements of the iterable are true.
```

any(*iterable*)

```
Returns True if any element of the iterable is true.
```

sorted(*iterable*, *cmp*=None, *key*=None, *reverse*=False)

45.2 Variables

Name	Description
__doc__	**Value:** ...
__revision__	**Value:** 'src/engine/SCons/compat/_scons_builtins.py 5023 2010/06/...

45.3 Class memoryview

object
└ **SCons.compat._scons_builtins.memoryview**

45.3.1 Methods

__init__(*self*, *obj*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

__getitem__(*self*, *indx*)

__delattr__(*...*)
`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)
`x.__getattribute__('name') <==> x.name`

__hash__(*x*)
`hash(x)`

__new__(*T*, *S*, *...*)

Return Value
`a new object with type S, a subtype of T`

__reduce__(*...*)
`helper for pickle`

__reduce_ex__(*...*)
`helper for pickle`

__repr__(*x*)
`repr(x)`

__setattr__(*...*)
`x.__setattr__('name', value) <==> x.name = value`

__**str**__(x)
`str(x)`

45.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

46 Module SCons.compat._scons_collections

```
collections compatibility module for older (pre-2.4) Python versions

This does not not NOT (repeat, *NOT*) provide complete collections
functionality.  It only wraps the portions of collections functionality
used by SCons, in an interface that looks enough like collections for
our purposes.
```

46.1 Variables

Name	Description
__doc__	**Value:** `...`
__revision__	**Value:** `'src/engine/SCons/compat/_scons_collections.py 5023 2010/...`

47 Module SCons.compat._scons_dbm

```
dbm compatibility module for Python versions that don't have dbm.

This does not not NOT (repeat, *NOT*) provide complete dbm functionality.
It's just a stub on which to hang just enough pieces of dbm functionality
that the whichdb.whichdb() implementstation in the various 2.X versions of
Python won't blow up even if dbm wasn't compiled in.
```

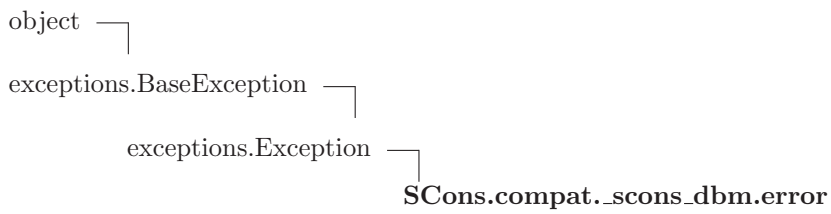
47.1 Functions

open(**args*, ***kw*)

47.2 Variables

Name	Description
__doc__	**Value:** `...`
__revision__	**Value:** `'src/engine/SCons/compat/_scons_dbm.py 5023 2010/06/14 22...`

47.3 Class error



47.3.1 Methods

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

Overrides: object.__delattr__

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__init__(...)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: exceptions.BaseException.__init__

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(...)

__str__(*x*)

```
str(x)
```

Overrides: object.__str__

47.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

48 Module SCons.compat._scons_hashlib

```
hashlib backwards-compatibility module for older (pre-2.5) Python versions

This does not not NOT (repeat, *NOT*) provide complete hashlib
functionality.  It only wraps the portions of MD5 functionality used
by SCons, in an interface that looks like hashlib (or enough for our
purposes, anyway).  In fact, this module will raise an ImportError if
the underlying md5 module isn't available.
```

48.1 Functions

md5(*string*='')

48.2 Variables

Name	Description
__doc__	**Value:** ...
__revision__	**Value:** 'src/engine/SCons/compat/_scons_hashlib.py 5023 2010/06/1...

48.3 Class md5obj

object
└ **SCons.compat._scons_hashlib.md5obj**

48.3.1 Methods

__init__(*self*, *name*, *string*='')
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__repr__(*self*)
`repr(x)`

Overrides: object.__repr__ extit(inherited documentation)

copy(*self*)

digest(*self*)

update(*self*, *arg*)

hexdigest(*self*)

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

48.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

48.3.3 Class Variables

Name	Description
md5_module	**Value:** <module 'md5' from '/usr/lib/python2.5/md5.pyc'>

48.4 Class md5obj

object
└
SCons.compat._scons_hashlib.md5obj

48.4.1 Methods

__init__(*self*, *name*, *string=''*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: object.__init__ extit(inherited documentation)

__repr__(*self*)
`repr(x)`

Overrides: object.__repr__ extit(inherited documentation)

copy(*self*)

digest(*self*)

update(*self*, *arg*)

hexdigest(*self*)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

__getattribute__(*...*)

`x.__getattribute__('name') <==> x.name`

__hash__(*x*)

`hash(x)`

__new__(*T*, *S*, *...*)

Return Value
`a new object with type S, a subtype of T`

__reduce__(*...*)

`helper for pickle`

__reduce_ex__(*...*)

`helper for pickle`

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

48.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

48.4.3 Class Variables

Name	Description
md5_module	**Value:** <module 'md5' from '/usr/lib/python2.5/md5.pyc'>

49 Module SCons.compat._scons_io

```
io compatibility module for older (pre-2.6) Python versions

This does not not NOT (repeat, *NOT*) provide complete io
functionality.  It only wraps the portions of io functionality used
by SCons, in an interface that looks enough like io for our purposes.
```

49.1 Variables

Name	Description
__doc__	**Value:** ...
__revision__	**Value:** 'src/engine/SCons/compat/_scons_io.py 5023 2010/06/14 22:...

50 Module SCons.compat._scons_sets

```
Classes to represent arbitrary sets (including sets of sets).

This module implements sets using dictionaries whose values are
ignored.  The usual operations (union, intersection, deletion, etc.)
are provided as both methods and operators.

Important: sets are not sequences!  While they support 'x in s',
'len(s)', and 'for x in s', none of those operations are unique for
sequences; for example, mappings support all three as well.  The
characteristic operation for sequences is subscripting with small
integers: s[i], for i in range(len(s)).  Sets don't support
subscripting at all.  Also, sequences allow multiple occurrences and
their elements have a definite order; sets on the other hand don't
record multiple occurrences and don't remember the order of element
insertion (which is why they don't support s[i]).

The following classes are provided:

BaseSet -- All the operations common to both mutable and immutable
    sets. This is an abstract class, not meant to be directly
    instantiated.

Set -- Mutable sets, subclass of BaseSet; not hashable.

ImmutableSet -- Immutable sets, subclass of BaseSet; hashable.
    An iterable argument is mandatory to create an ImmutableSet.

_TemporarilyImmutableSet -- A wrapper around a Set, hashable,
    giving the same hash value as the immutable set equivalent
    would have.  Do not use this class directly.

Only hashable objects can be added to a Set. In particular, you cannot
really add a Set as an element to another Set; if you try, what is
actually added is an ImmutableSet built from it (it compares equal to
the one you tried adding).

When you ask if `x in y' where x is a Set and y is a Set or
ImmutableSet, x is wrapped into a _TemporarilyImmutableSet z, and
what's tested is actually `z in y'.
```

50.1 Class BaseSet

object
└ **SCons.compat._scons_sets.BaseSet**

Known Subclasses: SCons.compat._scons_sets.ImmutableSet, SCons.compat._scons_sets.Set, SCons.compat._scons_sets._Ter

```
Common base class for mutable and immutable sets.
```

50.1.1 Methods

__init__(*self*)

```
This is an abstract class.
```

Overrides: object.__init__

__len__(*self*)

```
Return the number of elements of a set.
```

__repr__(*self*)

```
Return string representation of a set.

This looks like 'Set([<list of elements>])'.
```

Overrides: object.__repr__

__str__(*self*)

```
Return string representation of a set.

This looks like 'Set([<list of elements>])'.
```

Overrides: object.__str__

__iter__(*self*)

```
Return an iterator over the elements or a set.

This is the keys iterator for the underlying dict.
```

__cmp__(*self*, *other*)

__eq__(*self*, *other*)

__ne__(*self*, *other*)

copy(*self*)

```
Return a shallow copy of a set.
```

__copy__(*self*)

```
Return a shallow copy of a set.
```

__deepcopy__(*self*, *memo*)

```
Return a deep copy of a set; used by copy module.
```

__**or**__(*self*, *other*)

```
Return the union of two sets as a new set.

(I.e. all elements that are in either set.)
```

union(*self*, *other*)

```
Return the union of two sets as a new set.

(I.e. all elements that are in either set.)
```

__**and**__(*self*, *other*)

```
Return the intersection of two sets as a new set.

(I.e. all elements that are in both sets.)
```

intersection(*self*, *other*)

```
Return the intersection of two sets as a new set.

(I.e. all elements that are in both sets.)
```

__**xor**__(*self*, *other*)

```
Return the symmetric difference of two sets as a new set.

(I.e. all elements that are in exactly one of the sets.)
```

symmetric_difference(*self*, *other*)

```
Return the symmetric difference of two sets as a new set.

(I.e. all elements that are in exactly one of the sets.)
```

__**sub**__(*self*, *other*)

```
Return the difference of two sets as a new Set.

(I.e. all elements that are in this set and not in the other.)
```

difference(*self*, *other*)

```
Return the difference of two sets as a new Set.

(I.e. all elements that are in this set and not in the other.)
```

__**contains**__(*self*, *element*)

```
Report whether an element is a member of a set.

(Called in response to the expression 'element in self'.)
```

issubset(*self*, *other*)

```
Report whether another set contains this set.
```

issuperset(*self*, *other*)

```
Report whether this set contains another set.
```

__**le**__(*self*, *other*)

```
Report whether another set contains this set.
```

__**ge**__(*self*, *other*)

```
Report whether this set contains another set.
```

__**lt**__(*self*, *other*)

__**gt**__(*self*, *other*)

__**delattr**__(...)

```
x.__delattr__('name') <==> del x.name
```

__**getattribute**__(...)

```
x.__getattribute__('name') <==> x.name
```

__**hash**__(*x*)

```
hash(x)
```

__**new**__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__**reduce**__(...)

```
helper for pickle
```

__**reduce_ex**__(...)

```
helper for pickle
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

50.1.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

50.2 Class ImmutableSet

object

SCons.compat._scons_sets.BaseSet

SCons.compat._scons_sets.ImmutableSet

```
Immutable set class.
```

50.2.1 Methods

__init__(*self*, *iterable*=False)

```
Construct an immutable set from an optional iterable.
```

Overrides: SCons.compat._scons_sets.BaseSet.__init__

__hash__(*self*)

```
hash(x)
```

Overrides: object.__hash__ extit(inherited documentation)

__getstate__(*self*)

__setstate__(*self*, *state*)

__and__(*self*, *other*)

```
Return the intersection of two sets as a new set.

(I.e. all elements that are in both sets.)
```

__cmp__(*self*, *other*)

__contains__(*self*, *element*)

```
Report whether an element is a member of a set.

(Called in response to the expression ‘element in self’.)
```

__**copy**__(*self*)

Return a shallow copy of a set.

__**deepcopy**__(*self*, *memo*)

Return a deep copy of a set; used by copy module.

__**delattr**__(*...*)

x.__delattr__('name') <==> del x.name

__**eq**__(*self*, *other*)

__**ge**__(*self*, *other*)

Report whether this set contains another set.

__**getattribute**__(*...*)

x.__getattribute__('name') <==> x.name

__**gt**__(*self*, *other*)

__**iter**__(*self*)

Return an iterator over the elements or a set.

This is the keys iterator for the underlying dict.

__**le**__(*self*, *other*)

Report whether another set contains this set.

__**len**__(*self*)

Return the number of elements of a set.

__**lt**__(*self*, *other*)

__**ne**__(*self*, *other*)

__**new**__(*T*, *S*, *...*)

Return Value

a new object with type S, a subtype of T

__or__(*self*, *other*)

Return the union of two sets as a new set.

(I.e. all elements that are in either set.)

__reduce__(...)

helper for pickle

__reduce_ex__(...)

helper for pickle

__repr__(*self*)

Return string representation of a set.

This looks like 'Set([<list of elements>])'.

Overrides: object.__repr__

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

__str__(*self*)

Return string representation of a set.

This looks like 'Set([<list of elements>])'.

Overrides: object.__str__

__sub__(*self*, *other*)

Return the difference of two sets as a new Set.

(I.e. all elements that are in this set and not in the other.)

__xor__(*self*, *other*)

Return the symmetric difference of two sets as a new set.

(I.e. all elements that are in exactly one of the sets.)

copy(*self*)

Return a shallow copy of a set.

difference(*self*, *other*)

```
Return the difference of two sets as a new Set.

(I.e. all elements that are in this set and not in the other.)
```

intersection(*self*, *other*)

```
Return the intersection of two sets as a new set.

(I.e. all elements that are in both sets.)
```

issubset(*self*, *other*)

```
Report whether another set contains this set.
```

issuperset(*self*, *other*)

```
Report whether this set contains another set.
```

symmetric_difference(*self*, *other*)

```
Return the symmetric difference of two sets as a new set.

(I.e. all elements that are in exactly one of the sets.)
```

union(*self*, *other*)

```
Return the union of two sets as a new set.

(I.e. all elements that are in either set.)
```

50.2.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

50.3 Class Set

object
SCons.compat._scons_sets.BaseSet
SCons.compat._scons_sets.Set

```
Mutable set class.
```

50.3.1 Methods

__init__(*self*, *iterable*=`False`)

`Construct a set from an optional iterable.`

Overrides: SCons.compat._scons_sets.BaseSet.__init__

__getstate__(*self*)

__setstate__(*self*, *data*)

__hash__(*self*)

`A Set cannot be hashed.`

Overrides: object.__hash__

__ior__(*self*, *other*)

`Update a set with the union of itself and another.`

union_update(*self*, *other*)

`Update a set with the union of itself and another.`

__iand__(*self*, *other*)

`Update a set with the intersection of itself and another.`

intersection_update(*self*, *other*)

`Update a set with the intersection of itself and another.`

__ixor__(*self*, *other*)

`Update a set with the symmetric difference of itself and another.`

symmetric_difference_update(*self*, *other*)

`Update a set with the symmetric difference of itself and another.`

__isub__(*self*, *other*)

`Remove all elements of another set from this set.`

difference_update(*self*, *other*)

`Remove all elements of another set from this set.`

update(*self*, *iterable*)

`Add all values from an iterable (such as a list or file).`

clear(*self*)

```
Remove all elements from this set.
```

add(*self*, *element*)

```
Add an element to a set.

This has no effect if the element is already present.
```

remove(*self*, *element*)

```
Remove an element from a set; it must be a member.

If the element is not a member, raise a KeyError.
```

discard(*self*, *element*)

```
Remove an element from a set if it is a member.

If the element is not a member, do nothing.
```

pop(*self*)

```
Remove and return an arbitrary set element.
```

__as_immutable__(*self*)

__as_temporarily_immutable__(*self*)

__and__(*self*, *other*)

```
Return the intersection of two sets as a new set.

(I.e. all elements that are in both sets.)
```

__cmp__(*self*, *other*)

__contains__(*self*, *element*)

```
Report whether an element is a member of a set.

(Called in response to the expression ‘element in self’.)
```

__copy__(*self*)

```
Return a shallow copy of a set.
```

__deepcopy__(*self*, *memo*)

```
Return a deep copy of a set; used by copy module.
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__eq__(*self*, *other*)

__ge__(*self*, *other*)

```
Report whether this set contains another set.
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__gt__(*self*, *other*)

__iter__(*self*)

```
Return an iterator over the elements or a set.

This is the keys iterator for the underlying dict.
```

__le__(*self*, *other*)

```
Report whether another set contains this set.
```

__len__(*self*)

```
Return the number of elements of a set.
```

__lt__(*self*, *other*)

__ne__(*self*, *other*)

__new__(*T*, *S*, *...*)

Return Value

```
    a new object with type S, a subtype of T
```

__or__(*self*, *other*)

```
Return the union of two sets as a new set.

(I.e. all elements that are in either set.)
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(...)

helper for pickle

__repr__(*self*)

Return string representation of a set.

This looks like 'Set([<list of elements>])'.

Overrides: object.__repr__

__setattr__(...)

x.__setattr__('name', value) <==> x.name = value

__str__(*self*)

Return string representation of a set.

This looks like 'Set([<list of elements>])'.

Overrides: object.__str__

__sub__(*self*, *other*)

Return the difference of two sets as a new Set.

(I.e. all elements that are in this set and not in the other.)

__xor__(*self*, *other*)

Return the symmetric difference of two sets as a new set.

(I.e. all elements that are in exactly one of the sets.)

copy(*self*)

Return a shallow copy of a set.

difference(*self*, *other*)

Return the difference of two sets as a new Set.

(I.e. all elements that are in this set and not in the other.)

intersection(*self*, *other*)

Return the intersection of two sets as a new set.

(I.e. all elements that are in both sets.)

issubset(*self*, *other*)

```
Report whether another set contains this set.
```

issuperset(*self*, *other*)

```
Report whether this set contains another set.
```

symmetric_difference(*self*, *other*)

```
Return the symmetric difference of two sets as a new set.

(I.e. all elements that are in exactly one of the sets.)
```

union(*self*, *other*)

```
Return the union of two sets as a new set.

(I.e. all elements that are in either set.)
```

50.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

51 Module SCons.compat._scons_subprocess

```
subprocess - Subprocesses with accessible I/O streams

This module allows you to spawn processes, connect to their
input/output/error pipes, and obtain their return codes.  This module
intends to replace several other, older modules and functions, like:

os.system
os.spawn*
os.popen*
popen2.*
commands.*

Information about how the subprocess module can be used to replace these
modules and functions can be found below.



Using the subprocess module
===========================
This module defines one class called Popen:

class Popen(args, bufsize=0, executable=None,
            stdin=None, stdout=None, stderr=None,
            preexec_fn=None, close_fds=False, shell=False,
            cwd=None, env=None, universal_newlines=False,
            startupinfo=None, creationflags=0):


Arguments are:

args should be a string, or a sequence of program arguments.  The
program to execute is normally the first item in the args sequence or
string, but can be explicitly set by using the executable argument.

On UNIX, with shell=False (default): In this case, the Popen class
uses os.execvp() to execute the child program.  args should normally
be a sequence.  A string will be treated as a sequence with the string
as the only item (the program to execute).

On UNIX, with shell=True: If args is a string, it specifies the
command string to execute through the shell.  If args is a sequence,
the first item specifies the command string, and any additional items
will be treated as additional shell arguments.

On Windows: the Popen class uses CreateProcess() to execute the child
program, which operates on strings.  If args is a sequence, it will be
converted to a string using the list2cmdline method.  Please note that
not all MS Windows applications interpret the command line the same
way: The list2cmdline is designed for applications using the same
```

```
rules as the MS C runtime.

bufsize, if given, has the same meaning as the corresponding argument
to the built-in open() function: 0 means unbuffered, 1 means line
buffered, any other positive value means use a buffer of
(approximately) that size.  A negative bufsize means to use the system
default, which usually means fully buffered.  The default value for
bufsize is 0 (unbuffered).

stdin, stdout and stderr specify the executed programs' standard
input, standard output and standard error file handles, respectively.
Valid values are PIPE, an existing file descriptor (a positive
integer), an existing file object, and None.  PIPE indicates that a
new pipe to the child should be created.  With None, no redirection
will occur; the child's file handles will be inherited from the
parent.  Additionally, stderr can be STDOUT, which indicates that the
stderr data from the applications should be captured into the same
file handle as for stdout.

If preexec_fn is set to a callable object, this object will be called
in the child process just before the child is executed.

If close_fds is true, all file descriptors except 0, 1 and 2 will be
closed before the child process is executed.

if shell is true, the specified command will be executed through the
shell.

If cwd is not None, the current directory will be changed to cwd
before the child is executed.

If env is not None, it defines the environment variables for the new
process.

If universal_newlines is true, the file objects stdout and stderr are
opened as a text files, but lines may be terminated by any of '\n',
the Unix end-of-line convention, '\r', the Macintosh convention or
'\r\n', the Windows convention.  All of these external representations
are seen as '\n' by the Python program.  Note: This feature is only
available if Python is built with universal newline support (the
default).  Also, the newlines attribute of the file objects stdout,
stdin and stderr are not updated by the communicate() method.

The startupinfo and creationflags, if given, will be passed to the
underlying CreateProcess() function.  They can specify things such as
appearance of the main window and priority for the new process.
(Windows only)


This module also defines two shortcut functions:
```

```
call(*popenargs, **kwargs):
    Run command with arguments.  Wait for command to complete, then
    return the returncode attribute.

    The arguments are the same as for the Popen constructor.  Example:

    retcode = call(["ls", "-l"])

check_call(*popenargs, **kwargs):
    Run command with arguments.  Wait for command to complete.  If the
    exit code was zero then return, otherwise raise
    CalledProcessError.  The CalledProcessError object will have the
    return code in the returncode attribute.

    The arguments are the same as for the Popen constructor.  Example:

    check_call(["ls", "-l"])

Exceptions
----------
Exceptions raised in the child process, before the new program has
started to execute, will be re-raised in the parent.  Additionally,
the exception object will have one extra attribute called
'child_traceback', which is a string containing traceback information
from the childs point of view.

The most common exception raised is OSError.  This occurs, for
example, when trying to execute a non-existent file.  Applications
should prepare for OSErrors.

A ValueError will be raised if Popen is called with invalid arguments.

check_call() will raise CalledProcessError, if the called process
returns a non-zero return code.


Security
--------
Unlike some other popen functions, this implementation will never call
/bin/sh implicitly.  This means that all characters, including shell
metacharacters, can safely be passed to child processes.


Popen objects
=============
Instances of the Popen class have the following methods:

poll()
    Check if child process has terminated.  Returns returncode
    attribute.
```

```
wait()
    Wait for child process to terminate.  Returns returncode attribute.

communicate(input=None)
    Interact with process: Send data to stdin.  Read data from stdout
    and stderr, until end-of-file is reached.  Wait for process to
    terminate.  The optional stdin argument should be a string to be
    sent to the child process, or None, if no data should be sent to
    the child.

    communicate() returns a tuple (stdout, stderr).

    Note: The data read is buffered in memory, so do not use this
    method if the data size is large or unlimited.

The following attributes are also available:

stdin
    If the stdin argument is PIPE, this attribute is a file object
    that provides input to the child process.  Otherwise, it is None.

stdout
    If the stdout argument is PIPE, this attribute is a file object
    that provides output from the child process.  Otherwise, it is
    None.

stderr
    If the stderr argument is PIPE, this attribute is file object that
    provides error output from the child process.  Otherwise, it is
    None.

pid
    The process ID of the child process.

returncode
    The child return code.  A None value indicates that the process
    hasn't terminated yet.  A negative value -N indicates that the
    child was terminated by signal N (UNIX only).


Replacing older functions with the subprocess module
====================================================
In this section, "a ==> b" means that b can be used as a replacement
for a.

Note: All functions in this section fail (more or less) silently if
the executed program cannot be found; this module raises an OSError
exception.

In the following examples, we assume that the subprocess module is
imported with "from subprocess import *".
```

```
Replacing /bin/sh shell backquote
---------------------------------
output=‘mycmd myarg‘
==>
output = Popen(["mycmd", "myarg"], stdout=PIPE).communicate()[0]


Replacing shell pipe line
-------------------------
output=‘dmesg | grep hda‘
==>
p1 = Popen(["dmesg"], stdout=PIPE)
p2 = Popen(["grep", "hda"], stdin=p1.stdout, stdout=PIPE)
output = p2.communicate()[0]


Replacing os.system()
---------------------
sts = os.system("mycmd" + " myarg")
==>
p = Popen("mycmd" + " myarg", shell=True)
pid, sts = os.waitpid(p.pid, 0)

Note:

* Calling the program through the shell is usually not required.

* It’s easier to look at the returncode attribute than the
  exitstatus.

A more real-world example would look like this:

try:
    retcode = call("mycmd" + " myarg", shell=True)
    if retcode < 0:
        print >>sys.stderr, "Child was terminated by signal", -retcode
    else:
        print >>sys.stderr, "Child returned", retcode
except OSError, e:
    print >>sys.stderr, "Execution failed:", e


Replacing os.spawn*
-------------------
P_NOWAIT example:

pid = os.spawnlp(os.P_NOWAIT, "/bin/mycmd", "mycmd", "myarg")
==>
pid = Popen(["/bin/mycmd", "myarg"]).pid
```

```
P_WAIT example:

retcode = os.spawnlp(os.P_WAIT, "/bin/mycmd", "mycmd", "myarg")
==>
retcode = call(["/bin/mycmd", "myarg"])


Vector example:

os.spawnvp(os.P_NOWAIT, path, args)
==>
Popen([path] + args[1:])


Environment example:

os.spawnlpe(os.P_NOWAIT, "/bin/mycmd", "mycmd", "myarg", env)
==>
Popen(["/bin/mycmd", "myarg"], env={"PATH": "/usr/bin"})


Replacing os.popen*
-------------------
pipe = os.popen(cmd, mode='r', bufsize)
==>
pipe = Popen(cmd, shell=True, bufsize=bufsize, stdout=PIPE).stdout

pipe = os.popen(cmd, mode='w', bufsize)
==>
pipe = Popen(cmd, shell=True, bufsize=bufsize, stdin=PIPE).stdin


(child_stdin, child_stdout) = os.popen2(cmd, mode, bufsize)
==>
p = Popen(cmd, shell=True, bufsize=bufsize,
          stdin=PIPE, stdout=PIPE, close_fds=True)
(child_stdin, child_stdout) = (p.stdin, p.stdout)


(child_stdin,
 child_stdout,
 child_stderr) = os.popen3(cmd, mode, bufsize)
==>
p = Popen(cmd, shell=True, bufsize=bufsize,
          stdin=PIPE, stdout=PIPE, stderr=PIPE, close_fds=True)
(child_stdin,
 child_stdout,
 child_stderr) = (p.stdin, p.stdout, p.stderr)
```

```
(child_stdin, child_stdout_and_stderr) = os.popen4(cmd, mode, bufsize)
==>
p = Popen(cmd, shell=True, bufsize=bufsize,
          stdin=PIPE, stdout=PIPE, stderr=STDOUT, close_fds=True)
(child_stdin, child_stdout_and_stderr) = (p.stdin, p.stdout)


Replacing popen2.*
------------------
Note: If the cmd argument to popen2 functions is a string, the command
is executed through /bin/sh.  If it is a list, the command is directly
executed.

(child_stdout, child_stdin) = popen2.popen2("somestring", bufsize, mode)
==>
p = Popen(["somestring"], shell=True, bufsize=bufsize
          stdin=PIPE, stdout=PIPE, close_fds=True)
(child_stdout, child_stdin) = (p.stdout, p.stdin)


(child_stdout, child_stdin) = popen2.popen2(["mycmd", "myarg"], bufsize, mode)
==>
p = Popen(["mycmd", "myarg"], bufsize=bufsize,
          stdin=PIPE, stdout=PIPE, close_fds=True)
(child_stdout, child_stdin) = (p.stdout, p.stdin)

The popen2.Popen3 and popen3.Popen4 basically works as subprocess.Popen,
except that:

* subprocess.Popen raises an exception if the execution fails
* the capturestderr argument is replaced with the stderr argument.
* stdin=PIPE and stdout=PIPE must be specified.
* popen2 closes all filedescriptors by default, but you have to specify
  close_fds=True with subprocess.Popen.
```

51.1 Functions

call(**popenargs*, ***kwargs*)

```
Run command with arguments.  Wait for command to complete, then
return the returncode attribute.

The arguments are the same as for the Popen constructor.  Example:

retcode = call(["ls", "-l"])
```

check_call(**popenargs*, ***kwargs*)

```
Run command with arguments.  Wait for command to complete.  If
the exit code was zero then return, otherwise raise
CalledProcessError.  The CalledProcessError object will have the
return code in the returncode attribute.

The arguments are the same as for the Popen constructor.  Example:

check_call(["ls", "-l"])
```

51.2 Variables

Name	Description
PIPE	**Value:** `-1`
STDOUT	**Value:** `-2`

51.3 Class CalledProcessError

object
exceptions.BaseException
exceptions.Exception
SCons.compat._scons_subprocess.CalledProcessError

```
This exception is raised when a process run by check_call() returns
a non-zero exit status.  The exit status will be stored in the
returncode attribute.
```

51.3.1 Methods

__init__(*self*, *returncode*, *cmd*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`

Overrides: exceptions.Exception.__init__ extit(inherited documentation)

__str__(*self*)
`str(x)`

Overrides: exceptions.BaseException.__str__ extit(inherited documentation)

__delattr__(*...*)

`x.__delattr__('name') <==> del x.name`

Overrides: object.__delattr__

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

Overrides: object.__getattribute__

__getitem__(*x*, *y*)

```
x[y]
```

__getslice__(*x*, *i*, *j*)

```
x[i:j]

Use of negative indices is not supported.
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

Overrides: exceptions.BaseException.__new__

__reduce__(...)

```
helper for pickle
```

Overrides: object.__reduce__ extit(inherited documentation)

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

Overrides: object.__repr__

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

Overrides: object.__setattr__

__setstate__(...)

51.3.2 Properties

continued on next page

Name	Description

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>
args	**Value:** <attribute 'args' of 'exceptions.BaseException' objects>
message	**Value:** <member 'message' of 'exceptions.BaseException' objects>

51.4 Class Popen

object
└
SCons.compat._scons_subprocess.Popen

51.4.1 Methods

__init__(*self*, *args*, *bufsize*=0, *executable*=False, *stdin*=False, *stdout*=False, *stderr*=False, *preexec_fn*=False, *close_fds*=False, *shell*=False, *cwd*=False, *env*=False, *universal_newlines*=False, *startupinfo*=False, *creationflags*=0)

```
Create new Popen instance.
```

Overrides: object.__init__

__del__(*self*)

communicate(*self*, *input*=False)

```
Interact with process: Send data to stdin.  Read data from
stdout and stderr, until end-of-file is reached.  Wait for
process to terminate.  The optional input argument should be a
string to be sent to the child process, or None, if no data
should be sent to the child.

communicate() returns a tuple (stdout, stderr).
```

poll(*self*, *_deadstate*=False)

```
Check if child process has terminated.  Returns returncode
attribute.
```

wait(*self*)

```
Wait for child process to terminate.  Returns returncode
attribute.
```

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

51.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

52 Module SCons.cpp

SCons C Pre-Processor module

52.1 Functions

CPP_to_Python_Ops_Sub(m)

CPP_to_Python(s)

Converts a C pre-processor expression into an equivalent
Python expression that can be evaluated.

52.2 Variables

Name	Description
__doc__	**Value:** ...
cpp_lines_dict	**Value:** {('define'): '\\s+([_A-Za-z][_A-Za-z0-9_]*)(\\([^)]*\\))?...
Table	**Value:** {'define': re.compile(r'\s+([_A-Za-z][_A-Za-z0-9_]*)(\([^...
e	**Value:** '^\\s*#\\s*(elif|undef|include_next|endif|else|include|if...
CPP_Expression	**Value:** re.compile(r'(?m)^\s*#\s*(elif|undef|include_next|endif|e...
CPP_to_Python_Ops_Dict	**Value:** {'\r': '', '!': ' not ', '!=': ' != ', '&&': ' and ', ':'...
CPP_to_Python_Ops_Expression	**Value:** re.compile(r'|||&&|!=|!|\r|:|\?')
CPP_to_Python_Eval_List	**Value:** [[re.compile(r'defined\s+(\w+)'), '"\\1" in __dict__'], [...
line_continuations	**Value:** re.compile(r'\\\r?\n')
function_name	**Value:** re.compile(r'(\S+)\(([^)]*)\)')
function_arg_separator	**Value:** re.compile(r',\s*')
x	**Value:** 'if'

52.3 Class FunctionEvaluator

object
└ **SCons.cpp.FunctionEvaluator**

Handles delayed evaluation of a #define function call.

52.3.1 Methods

__init__(*self*, *name*, *args*, *expansion*)

```
Squirrels away the arguments and expansion value of a #define
macro function for later evaluation when we must actually expand
a value that uses it.
```

Overrides: object.__init__

__call__(*self*, **values*)

```
Evaluates the expansion of a #define macro function called
with the specified values.
```

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

52.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

52.4 Class PreProcessor

object
└ **SCons.cpp.PreProcessor**

Known Subclasses: SCons.cpp.DumbPreProcessor, SCons.Scanner.C.SConsCPPScanner

```
The main workhorse class for handling C pre-processing.
```

52.4.1 Methods

__call__(*self*, *file*)

```
Pre-processes a file.

This is the main public entry point.
```

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__init__(*self*, *current*='.', *cpppath*=(), *dict*={}, *all*=0)

```
x.__init__(...) initializes x; see x.__class__.__doc__ for signature
```

Overrides: object.__init__ extit(inherited documentation)

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

all_include(*self*, *t*)

do_define(*self*, *t*)

```
Default handling of a #define line.
```

do_elif(*self*, *t*)

```
Default handling of a #elif line.
```

do_else(*self*, *t*)

```
Default handling of a #else line.
```

do_endif(*self*, *t*)

```
Default handling of a #endif line.
```

do_if(*self*, *t*)

```
Default handling of a #if line.
```

do_ifdef(*self*, *t*)

```
Default handling of a #ifdef line.
```

do_ifndef(*self*, *t*)

```
Default handling of a #ifndef line.
```

do_import(*self*, *t*)

```
Default handling of a #import line.
```

do_include(*self*, *t*)

```
Default handling of a #include line.
```

do_include_next(*self*, *t*)

```
Default handling of a #include line.
```

do_nothing(*self*, *t*)

```
Null method for when we explicitly want the action for a
specific preprocessor directive to do nothing.
```

do_undef(*self*, *t*)

```
Default handling of a #undef line.
```

eval_expression(*self*, *t*)

```
Evaluates a C preprocessor expression.

This is done by converting it to a Python equivalent and
eval()ing it in the C preprocessor namespace we use to
track #define values.
```

finalize_result(*self*, *fname*)

find_include_file(*self*, *t*)

```
Finds the #include file for a given preprocessor tuple.
```

initialize_result(*self*, *fname*)

process_contents(*self*, *contents*, *fname*=False)

```
Pre-processes a file contents.

This is the main internal entry point.
```

read_file(*self*, *file*)

resolve_include(*self*, *t*)

```
Resolve a tuple-ized #include line.

This handles recursive expansion of values without "" or <>
surrounding the name until an initial " or < is found, to handle
        #include FILE
where FILE is a #define somewhere else.
```

restore(*self*)

```
Pops the previous dispatch table off the stack and makes it the
current one.
```

save(*self*)

```
Pushes the current dispatch table on the stack and re-initializes
the current dispatch table to the default.
```

scons_current_file(*self*, *t*)

start_handling_includes(*self*, *t*=False)

```
Causes the PreProcessor object to start processing #import,
#include and #include_next lines.

This method will be called when a #if, #ifdef, #ifndef or #elif
evaluates True, or when we reach the #else in a #if, #ifdef,
#ifndef or #elif block where a condition already evaluated
False.
```

stop_handling_includes(*self*, *t*=False)

```
Causes the PreProcessor object to stop processing #import,
#include and #include_next lines.

This method will be called when a #if, #ifdef, #ifndef or #elif
evaluates False, or when we reach the #else in a #if, #ifdef,
#ifndef or #elif block where a condition already evaluated True.
```

tupleize(*self*, *contents*)

```
Turns the contents of a file into a list of easily-processed
tuples describing the CPP lines in the file.

The first element of each tuple is the line's preprocessor
directive (#if, #include, #define, etc., minus the initial '#').
The remaining elements are specific to the type of directive, as
pulled apart by the regular expression.
```

52.4.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

52.5 Class DumbPreProcessor

object
SCons.cpp.PreProcessor
SCons.cpp.DumbPreProcessor

```
A preprocessor that ignores all #if/#elif/#else/#endif directives
and just reports back *all* of the #include files (like the classic
SCons scanner did).

This is functionally equivalent to using a regular expression to
find all of the #include lines, only slower.  It exists mainly as
an example of how the main PreProcessor class can be sub-classed
to tailor its behavior.
```

52.5.1 Methods

__**init**__(*self*, **args*, ***kw*)
Overrides: SCons.cpp.PreProcessor.__init__

__call__(*self*, *file*)

```
Pre-processes a file.

This is the main public entry point.
```

__delattr__(...)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(...)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, ...)

Return Value

```
    a new object with type S, a subtype of T
```

__reduce__(...)

```
helper for pickle
```

__reduce_ex__(...)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(...)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

all_include(*self*, *t*)

do_define(*self*, *t*)

```
Default handling of a #define line.
```

do_elif(*self*, *t*)

```
Default handling of a #elif line.
```

do_else(*self*, *t*)

```
Default handling of a #else line.
```

do_endif(*self*, *t*)

```
Default handling of a #endif line.
```

do_if(*self*, *t*)

```
Default handling of a #if line.
```

do_ifdef(*self*, *t*)

```
Default handling of a #ifdef line.
```

do_ifndef(*self*, *t*)

```
Default handling of a #ifndef line.
```

do_import(*self*, *t*)

```
Default handling of a #import line.
```

do_include(*self*, *t*)

```
Default handling of a #include line.
```

do_include_next(*self*, *t*)

```
Default handling of a #include line.
```

do_nothing(*self*, *t*)

```
Null method for when we explicitly want the action for a
specific preprocessor directive to do nothing.
```

do_undef(*self*, *t*)

```
Default handling of a #undef line.
```

eval_expression(*self*, *t*)

```
Evaluates a C preprocessor expression.

This is done by converting it to a Python equivalent and
eval()ing it in the C preprocessor namespace we use to
track #define values.
```

finalize_result(*self*, *fname*)

find_include_file(*self*, *t*)

```
Finds the #include file for a given preprocessor tuple.
```

initialize_result(*self*, *fname*)

process_contents(*self*, *contents*, *fname*=False)

```
Pre-processes a file contents.

This is the main internal entry point.
```

read_file(*self*, *file*)

resolve_include(*self*, *t*)

```
Resolve a tuple-ized #include line.

This handles recursive expansion of values without "" or <>
surrounding the name until an initial " or < is found, to handle
        #include FILE
where FILE is a #define somewhere else.
```

restore(*self*)

```
Pops the previous dispatch table off the stack and makes it the
current one.
```

save(*self*)

```
Pushes the current dispatch table on the stack and re-initializes
the current dispatch table to the default.
```

scons_current_file(*self*, *t*)

start_handling_includes(*self*, *t*=False)

```
Causes the PreProcessor object to start processing #import,
#include and #include_next lines.

This method will be called when a #if, #ifdef, #ifndef or #elif
evaluates True, or when we reach the #else in a #if, #ifdef,
#ifndef or #elif block where a condition already evaluated
False.
```

stop_handling_includes(*self*, *t*=False)

```
Causes the PreProcessor object to stop processing #import,
#include and #include_next lines.

This method will be called when a #if, #ifdef, #ifndef or #elif
evaluates False, or when we reach the #else in a #if, #ifdef,
#ifndef or #elif block where a condition already evaluated True.
```

tupleize(*self*, *contents*)

```
Turns the contents of a file into a list of easily-processed
tuples describing the CPP lines in the file.

The first element of each tuple is the line's preprocessor
directive (#if, #include, #define, etc., minus the initial '#').
The remaining elements are specific to the type of directive, as
pulled apart by the regular expression.
```

52.5.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

53 Module SCons.dblite

53.1 Functions

corruption_warning(*filename*)

is_string(*s*)

unicode(*s*)

open(*file*, *flag*=`False`, *mode*=`438`)

53.2 Variables

Name	Description
keep_all_files	**Value:** `0`
ignore_corrupt_dbfiles	**Value:** `0`
dblite_suffix	**Value:** `'.dblite'`
tmp_suffix	**Value:** `'.tmp'`

53.3 Class dblite

object
└ **SCons.dblite.dblite**

53.3.1 Methods

__init__(*self*, *file_base_name*, *flag*, *mode*)
`x.__init__(...) initializes x; see x.__class__.__doc__ for signature`
Overrides: object.__init__ extit(inherited documentation)

__del__(*self*)

sync(*self*)

__getitem__(*self*, *key*)

__setitem__(*self*, *key*, *value*)

keys(*self*)

has_key(*self*, *key*)

__contains__(*self*, *key*)

iterkeys(*self*)

__iter__(*self*)

__len__(*self*)

__delattr__(*...*)

```
x.__delattr__('name') <==> del x.name
```

__getattribute__(*...*)

```
x.__getattribute__('name') <==> x.name
```

__hash__(*x*)

```
hash(x)
```

__new__(*T*, *S*, *...*)

Return Value

```
a new object with type S, a subtype of T
```

__reduce__(*...*)

```
helper for pickle
```

__reduce_ex__(*...*)

```
helper for pickle
```

__repr__(*x*)

```
repr(x)
```

__setattr__(*...*)

```
x.__setattr__('name', value) <==> x.name = value
```

__str__(*x*)

```
str(x)
```

53.3.2 Properties

Name	Description
__class__	**Value:** <attribute '__class__' of 'object' objects>

54 Module SCons.exitfuncs

```
SCons.exitfuncs

Register functions which are executed when SCons exits for any reason.
```

54.1 Functions

register(*func*, **targs*, ***kargs*)

```
register a function to be executed upon normal program termination

func - function to be called at exit
targs - optional arguments to pass to func
kargs - optional keyword arguments to pass to func
```

54.2 Variables

Name	Description
__revision__	**Value:** `'src/engine/SCons/exitfuncs.py 5023 2010/06/14 22:05:46 s...`
x	**Value:** `sys.exitfunc`

55 Module md5

55.1 Variables

Name	Description
blocksize	**Value:** `1`
digest_size	**Value:** `16`

Index

cmd.Cmd.cmdloop *(function)*, 374
cmd.Cmd.columnize *(function)*, 375
cmd.Cmd.complete *(function)*, 375
cmd.Cmd.complete_help *(function)*, 375
cmd.Cmd.completedefault *(function)*, 375
cmd.Cmd.completenames *(function)*, 375
cmd.Cmd.emptyline *(function)*, 375
cmd.Cmd.get_names *(function)*, 375
cmd.Cmd.parseline *(function)*, 375
cmd.Cmd.postcmd *(function)*, 375
cmd.Cmd.postloop *(function)*, 375
cmd.Cmd.precmd *(function)*, 376
cmd.Cmd.preloop *(function)*, 376
cmd.Cmd.print_topics *(function)*, 376

exceptions.BaseException.__getitem__ *(function)*, 98, 99, 101, 103, 104, 106, 108, 180, 291, 293, 295, 296, 378, 405, 472, 473, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 573, 602
exceptions.BaseException.__getslice__ *(function)*, 98, 99, 101, 103, 104, 106, 108, 180, 291, 293, 295, 296, 378, 405, 472, 473, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 573, 602
exceptions.BaseException.__setstate__ *(function)*, 98, 100, 102, 104, 105, 107, 109, 181, 292, 294, 295, 297, 379, 406, 472, 474, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 574, 602

md5 *(module)*, 619

object.__delattr__ *(function)*, 8, 11, 13, 15, 17, 20, 21, 23, 35, 38, 39, 42, 52, 53, 56, 58, 63, 71, 82, 92, 110, 114, 117, 120, 121, 123, 125, 126, 128, 129, 133, 135–137, 142, 144, 145, 158, 161, 163, 166, 181, 183, 187, 199, 212, 215, 217, 219, 226, 238, 252, 254, 261, 271, 273, 275, 278, 298, 300, 302, 309, 311, 314, 315, 317, 318, 320, 322, 325, 326, 332, 336, 338, 340, 343, 347, 350, 354, 357, 362, 380, 383, 387, 392, 397–400, 402, 407, 415, 418, 426, 427, 432, 435, 439, 444, 446, 450, 457, 467, 469, 470, 480, 483, 490, 570, 576, 578, 584, 586, 590, 603, 606, 607, 612, 617
object.__getattribute__ *(function)*, 8, 11, 13, 15, 17, 20, 21, 23, 35, 38, 39, 42, 52, 53, 56, 58, 63, 71, 82, 92, 111, 114, 117, 120, 121, 123, 125, 126, 128, 129, 133, 135, 136, 138, 142, 144, 145, 158, 162, 163, 166, 181, 183, 187, 200, 212, 215, 217, 219, 226, 238, 253, 254, 261, 271, 273, 275, 278, 298, 300, 302, 309, 311, 314, 316–318, 320, 322, 325, 326, 332, 336, 338, 340, 343, 347, 350, 354, 358, 362, 380, 383, 387, 392, 397–399, 401, 402, 407, 415, 419, 420, 422, 426, 427, 432, 435, 436, 439, 444, 446, 451, 457, 467, 469, 470, 480, 483, 485, 486, 490, 570, 577, 578, 584, 586, 591, 603, 606, 607, 612, 617
object.__hash__ *(function)*, 9, 11, 13, 15, 18, 20, 22, 23, 35, 38, 40, 42, 52, 53, 56, 58, 63, 71, 83, 92, 98, 99, 101, 103, 105, 106, 108, 111, 114, 118, 120, 121, 123, 125, 126, 128, 129, 133, 135, 136, 138, 142, 144, 145, 158, 162, 163, 166, 180, 181, 183, 187, 200, 212, 215, 217, 219, 226, 238, 253, 254, 261, 272, 273, 275, 278, 291, 293, 295, 296, 298, 300, 302, 309, 311, 314, 316–318, 320, 322, 325, 343, 347, 358, 379, 380, 383, 387, 392, 397–399, 401, 402, 405, 407, 415, 419, 421, 422, 426, 427, 432, 435, 436, 439, 444, 446, 451, 457, 467, 469, 470, 472, 474, 480, 483, 485, 486, 490, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 570, 574, 577, 578, 584, 602, 604, 606, 607, 612, 617
object.__init__ *(function)*, 9, 212, 398, 467
object.__new__ *(function)*, 9, 11, 13, 15, 18, 20, 22, 23, 35, 38, 40, 42, 52, 54, 56, 58, 63, 72, 83, 92, 111, 114, 118, 120, 121, 123, 125, 126, 128, 130, 133, 135, 136, 138, 142, 144, 146, 158, 162, 163, 167, 181, 183, 188, 200, 212, 215, 217, 219, 226, 238, 253, 254, 262, 272, 273, 275, 278, 298, 300, 303, 309, 311, 314, 316, 317, 319, 320, 322, 325, 327, 332, 336, 338, 340, 343, 347, 350, 354, 358, 362, 380, 384, 388, 393, 397, 398, 400–402, 407, 415, 419, 426, 427, 432, 435, 439, 444, 446, 451, 457, 467, 469, 470, 480, 483, 490, 570, 577, 578, 584, 586, 591, 604, 606, 607, 612, 617
object.__reduce__ *(function)*, 9, 11, 13, 15, 18, 20, 22, 23, 35, 38, 40, 42, 52, 54, 57, 58, 64, 72, 83,

92, 111, 114, 118, 120, 122, 123, 125, 126, 128, 130, 134, 135, 137–139, 143, 144, 146, 159, 162, 164, 167, 182, 183, 188, 200, 212, 215, 217, 219, 226, 238, 253, 255, 262, 272, 274, 275, 279, 298, 300, 303, 309, 311, 314, 316, 317, 319, 321, 322, 325, 328, 332, 336, 338, 340, 343, 347, 350, 354, 358, 362, 380, 384, 388, 393, 397, 398, 400–402, 407, 416, 419, 421, 422, 426, 428, 432, 435, 437, 439, 444, 446, 451, 457, 467, 469, 471, 480, 483, 485, 487, 490, 570, 577, 578, 584, 587, 591, 604, 606, 608, 612, 617

object.__reduce_ex__ *(function)*, 9, 11, 13, 15, 18, 20, 22, 23, 35, 38, 40, 43, 52, 54, 57, 59, 64, 72, 83, 92, 98, 100, 102, 103, 105, 107, 109, 111, 114, 118, 120, 122, 124–126, 128, 130, 134, 135, 137–139, 143, 144, 146, 159, 162, 164, 167, 180, 182, 183, 188, 200, 212, 215, 217, 219, 226, 238, 253, 255, 262, 272, 274, 275, 279, 292, 293, 295, 297, 298, 301, 303, 309, 311, 314, 316, 317, 319, 321, 322, 325, 328, 332, 336, 338, 340, 343, 347, 350, 354, 358, 362, 379, 381, 384, 388, 393, 397, 398, 400–402, 406, 407, 416, 419, 421, 422, 426, 428, 432, 435, 437, 439, 445, 446, 451, 457, 467, 469, 471, 472, 474, 480, 484, 485, 487, 490, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 570, 574, 577, 578, 584, 587, 591, 602, 604, 606, 608, 612, 617

object.__repr__ *(function)*, 9, 11, 14, 15, 18, 20, 22, 23, 35, 38, 40, 43, 52, 54, 57, 64, 72, 83, 92, 111, 118, 120, 122, 124, 125, 128, 130, 134, 135, 137, 138, 143, 144, 146, 159, 162, 164, 167, 182, 183, 188, 200, 212, 215, 217, 219, 226, 238, 253, 255, 262, 272, 274, 275, 279, 298, 301, 303, 309, 311, 314, 316, 317, 319, 321, 322, 325, 328, 332, 336, 338, 340, 343, 347, 350, 354, 358, 362, 381, 384, 388, 393, 397, 398, 400–402, 407, 416, 419, 426, 428, 432, 440, 445, 446, 451, 457, 467, 469, 471, 480, 484, 490, 570, 604, 606, 608, 612, 617

object.__setattr__ *(function)*, 9, 11, 14, 15, 18, 20, 22, 23, 35, 38, 40, 43, 53, 54, 57, 64, 72, 93, 111, 114, 118, 120, 122, 124–126, 128, 130, 134, 135, 137, 138, 143, 145, 146, 159, 162, 164, 167, 182, 183, 188, 200, 212, 215, 217, 219, 226, 238, 253, 255, 262, 272, 274, 275, 279, 299, 301, 303, 309, 311, 314, 316, 317, 319, 321, 322, 325, 328, 332, 336, 338, 340, 343, 348, 350, 354, 358, 363, 381, 384, 388, 393, 397, 399–401, 403, 407, 416, 419, 426, 428, 432, 435, 440, 445, 446, 451, 457, 467, 469, 471, 480, 484, 490, 570, 577, 578, 584, 587, 592, 604, 606, 608, 612, 617

object.__str__ *(function)*, 9, 23, 35, 38, 40, 43, 53, 54, 57, 64, 72, 83, 93, 111, 120, 122, 124, 125, 127, 128, 130, 134, 135, 137, 138, 140, 143, 145, 146, 159, 162, 164, 182, 212, 215, 218, 219, 253, 255, 272, 274, 276, 299, 301, 303, 309, 312, 314, 316, 317, 319, 321, 323, 326, 343, 348, 358, 381, 384, 388, 393, 397, 399–401, 403, 407, 416, 419, 421, 423, 432, 440, 445, 447, 451, 457, 467, 470, 471, 481, 484, 485, 487, 491, 570, 577, 579, 604, 606, 608, 612, 617

SCons *(package)*, 2–5
- SCons.Action *(module)*, 6–24
- SCons.Builder *(module)*, 25–40
  - SCons.Builder.Builder *(function)*, 26
  - SCons.Builder.BuilderBase *(class)*, 36–39
  - SCons.Builder.CallableSelector *(class)*, 28–30
  - SCons.Builder.CompositeBuilder *(class)*, 39–40
  - SCons.Builder.DictCmdGenerator *(class)*, 27–28
  - SCons.Builder.DictEmitter *(class)*, 30–31
  - SCons.Builder.EmitterProxy *(class)*, 34–36
  - SCons.Builder.is_a_Builder *(function)*, 26
  - SCons.Builder.ListEmitter *(class)*, 31–33
  - SCons.Builder.match_splitext *(function)*, 26
  - SCons.Builder.OverrideWarner *(class)*, 33–34
- SCons.CacheDir *(module)*, 41–43
  - SCons.CacheDir.CacheDir *(class)*, 41–43
  - SCons.CacheDir.CachePushFunc *(function)*, 41
  - SCons.CacheDir.CacheRetrieveFunc *(function)*, 41
  - SCons.CacheDir.CacheRetrieveString *(function)*, 41
- SCons.compat *(package)*, 567–568
  - SCons.compat._scons_builtins *(module)*, 569–571
  - SCons.compat._scons_collections *(module)*, 572
  - SCons.compat._scons_dbm *(module)*, 573–575
  - SCons.compat._scons_hashlib *(module)*, 576–579
  - SCons.compat._scons_io *(module)*, 580
  - SCons.compat._scons_sets *(module)*, 581–593
  - SCons.compat._scons_subprocess *(module)*, 594–604
  - SCons.compat.import_as *(function)*, 568

SCons.compat.lexists *(function)*, 568
SCons.compat.rename_module *(function)*, 568
SCons.Conftest *(module)*, 44–47
SCons.cpp *(module)*, 605–616
SCons.dblite *(module)*, 616–617
SCons.dblite.corruption_warning *(function)*, 616
SCons.dblite.dblite *(class)*, 616–617
SCons.dblite.is_string *(function)*, 616
SCons.dblite.open *(function)*, 616
SCons.dblite.unicode *(function)*, 616
SCons.Debug *(module)*, 48–49
SCons.Debug.caller_stack *(function)*, 48
SCons.Debug.caller_trace *(function)*, 48
SCons.Debug.countLoggedInstances *(function)*, 48
SCons.Debug.dump_caller_counts *(function)*, 48
SCons.Debug.dumpLoggedInstances *(function)*, 48
SCons.Debug.fetchLoggedInstances *(function)*, 48
SCons.Debug.func_shorten *(function)*, 48
SCons.Debug.listLoggedInstances *(function)*, 48
SCons.Debug.logInstanceCreation *(function)*, 48
SCons.Debug.memory *(function)*, 48
SCons.Debug.string_to_classes *(function)*, 48
SCons.Debug.Trace *(function)*, 48
SCons.Defaults *(module)*, 50–54
SCons.Environment *(module)*, 55–95
SCons.Environment.alias_builder *(function)*, 55
SCons.Environment.apply_tools *(function)*, 55
SCons.Environment.Base *(class)*, 64–74, 85–95
SCons.Environment.BuilderDict *(class)*, 59–60
SCons.Environment.BuilderWrapper *(class)*, 57–59
SCons.Environment.copy_non_reserved_keywords *(function)*, 55
SCons.Environment.default_copy_from_cache *(function)*, 55
SCons.Environment.default_decide_source *(function)*, 55
SCons.Environment.default_decide_target *(function)*, 55
SCons.Environment.is_valid_construction_var *(function)*, 55
SCons.Environment.MethodWrapper *(class)*, 56–57
SCons.Environment.NoSubstitutionProxy *(function)*, 55
SCons.Environment.OverrideEnvironment *(class)*, 74–85
SCons.Environment.SubstitutionEnvironment *(class)*, 60–64
SCons.Errors *(module)*, 96–109
SCons.Executor *(module)*, 110–120
SCons.Executor.AddBatchExecutor *(function)*, 110
SCons.Executor.Batch *(class)*, 110–111
SCons.Executor.Executor *(class)*, 115–119
SCons.Executor.get_NullEnvironment *(function)*, 110
SCons.Executor.GetBatchExecutor *(function)*, 110
SCons.Executor.Null *(class)*, 119–120
SCons.Executor.rfile *(function)*, 110
SCons.Executor.TSList *(class)*, 111–113
SCons.Executor.TSObject *(class)*, 113–115
SCons.exitfuncs *(module)*, 618
SCons.exitfuncs.register *(function)*, 618
SCons.Job *(module)*, 121–130
SCons.Job.InterruptState *(class)*, 121–122
SCons.Job.Jobs *(class)*, 122–124
SCons.Job.Parallel *(class)*, 129–130
SCons.Job.Serial *(class)*, 124–126
SCons.Job.ThreadPool *(class)*, 127–129
SCons.Job.Worker *(class)*, 126–127
SCons.Memoize *(module)*, 131–140
SCons.Node *(package)*, 141–159
SCons.Node.Alias *(module)*, 160–176
SCons.Node.FS *(module)*, 177–272
SCons.Node.Python *(module)*, 273–287
SCons.PathList *(module)*, 288
SCons.PathList.node_conv *(function)*, 288
SCons.PathList.PathList *(function)*, 288
SCons.Scanner *(module)*
SCons.Scanner.Base *(class)*, 326–329
SCons.Scanner.Classic *(class)*, 337–339
SCons.Scanner.ClassicCPP *(class)*, 339–341
SCons.Scanner.Current *(class)*, 333–337
SCons.Scanner.FindPathDirs *(class)*, 325–326
SCons.Scanner.Scanner *(function)*, 324
SCons.Scanner.Selector *(class)*, 329–333
SCons.Scanner *(package)*, 324–341
SCons.Scanner.C *(module)*, 342–348
SCons.Scanner.D *(module)*, 349–351
SCons.Scanner.Dir *(module)*, 352
SCons.Scanner.Fortran *(module)*, 353–355
SCons.Scanner.IDL *(module)*, 356
SCons.Scanner.LaTeX *(module)*, 357–363
SCons.Scanner.Prog *(module)*, 364
SCons.Scanner.RC *(module)*, 365

SCons.SConf *(module)*, 289–312
SCons.SConf.CheckCC *(function)*, 289
SCons.SConf.CheckCHeader *(function)*, 289
SCons.SConf.CheckContext *(class)*, 310–312
SCons.SConf.CheckCXX *(function)*, 289
SCons.SConf.CheckCXXHeader *(function)*, 290
SCons.SConf.CheckDeclaration *(function)*, 289
SCons.SConf.CheckFunc *(function)*, 289
SCons.SConf.CheckHeader *(function)*, 289
SCons.SConf.CheckLib *(function)*, 290
SCons.SConf.CheckLibWithHeader *(function)*, 290
SCons.SConf.CheckSHCC *(function)*, 289
SCons.SConf.CheckSHCXX *(function)*, 289
SCons.SConf.CheckType *(function)*, 289
SCons.SConf.CheckTypeSize *(function)*, 289
SCons.SConf.ConfigureCacheError *(class)*, 296–298
SCons.SConf.ConfigureDryRunError *(class)*, 294–296
SCons.SConf.CreateConfigHBuilder *(function)*, 289
SCons.SConf.createIncludesFromHeaders *(function)*, 289
SCons.SConf.SConf *(function)*, 289
SCons.SConf.SConfBase *(class)*, 307–310
SCons.SConf.SConfBuildInfo *(class)*, 298–300
SCons.SConf.SConfBuildTask *(class)*, 301–307
SCons.SConf.SConfError *(class)*, 292–294
SCons.SConf.SConfWarning *(class)*, 291–292
SCons.SConf.SetBuildType *(function)*, 289
SCons.SConf.SetCacheMode *(function)*, 289
SCons.SConf.SetProgressDisplay *(function)*, 289
SCons.SConf.Streamer *(class)*, 300–301
SCons.SConsign *(module)*, 313–323
SCons.SConsign.Base *(class)*, 315–316
SCons.SConsign.corrupt_dblite_warning *(function)*, 313
SCons.SConsign.DB *(class)*, 316–318, 322–323
SCons.SConsign.Dir *(class)*, 318–320
SCons.SConsign.DirFile *(class)*, 320–322
SCons.SConsign.File *(function)*, 313
SCons.SConsign.Get_DataBase *(function)*, 313
SCons.SConsign.Reset *(function)*, 313
SCons.SConsign.SConsignEntry *(class)*, 313–315
SCons.SConsign.write *(function)*, 313
SCons.Script *(module)*
SCons.Script.HelpFunction *(function)*, 366
SCons.Script.Options *(function)*, 366
SCons.Script.TargetList *(class)*, 370–372
SCons.Script.Variables *(function)*, 366
SCons.Script *(package)*, 366–372
SCons.Script.Interactive *(module)*, 373–376
SCons.Script.Main *(module)*, 377–403
SCons.Script.SConscript' *(module)*, 404–419
SCons.Sig *(module)*, 420–423
SCons.Sig.MD5Null *(class)*, 420–422
SCons.Sig.TimeStampNull *(class)*, 422–423
SCons.Subst *(module)*, 424–437
SCons.Taskmaster *(module)*, 438–458
SCons.Taskmaster.AlwaysTask *(class)*, 445–450
SCons.Taskmaster.dump_stats *(function)*, 438
SCons.Taskmaster.find_cycle *(function)*, 438
SCons.Taskmaster.OutOfDateTask *(class)*, 450–455
SCons.Taskmaster.Stats *(class)*, 439–440
SCons.Taskmaster.Task *(class)*, 440–445
SCons.Taskmaster.Taskmaster *(class)*, 455–458
SCons.Util *(module)*, 459–487
SCons.Variables *(package)*, 488–491
SCons.Variables.BoolVariable' *(module)*, 492
SCons.Variables.EnumVariable' *(module)*, 493
SCons.Variables.ListVariable' *(module)*, 494
SCons.Variables.PackageVariable' *(module)*, 495
SCons.Variables.PathVariable' *(module)*, 496–497
SCons.Variables.Variables *(class)*, 488–491
SCons.Warnings *(module)*, 498–566
SCons.Action._ActionAction *(class)*
SCons.Action._ActionAction.__call__ *(method)*, 10, 17
SCons.Action._ActionAction.print_cmd_line *(method)*, 12, 16, 18
SCons.Action.Action *(function)*, 7
SCons.Action.ActionBase *(class)*, 8–10
SCons.Action.ActionBase.__add__ *(method)*, 8, 10, 13, 15, 17, 19
SCons.Action.ActionBase.__cmp__ *(method)*, 8, 11, 13, 15, 17, 20
SCons.Action.ActionBase.__radd__ *(method)*, 8, 11, 13, 15, 18, 20
SCons.Action.ActionBase.genstring *(method)*, 8, 11, 18
SCons.Action.ActionBase.get_contents *(method)*, 8, 11, 14, 16, 18, 20
SCons.Action.ActionBase.get_targets *(method)*, 8, 11, 18, 20
SCons.Action.ActionBase.get_varlist *(method)*, 8, 12, 18
SCons.Action.ActionBase.no_batch_key *(method)*, 8, 11, 12, 14, 16, 18, 20

SCons.Action.ActionBase.presub_lines *(method)*, 8, 12, 14, 16, 18
SCons.Action.ActionCaller *(class)*, 21–22
SCons.Action.ActionCaller.__call__ *(method)*, 21
SCons.Action.ActionCaller.get_contents *(method)*, 21
SCons.Action.ActionCaller.strfunction *(method)*, 21
SCons.Action.ActionCaller.subst *(method)*, 21
SCons.Action.ActionCaller.subst_args *(method)*, 21
SCons.Action.ActionCaller.subst_kw *(method)*, 21
SCons.Action.ActionFactory *(class)*, 22–24
SCons.Action.ActionFactory.__call__ *(method)*, 23
SCons.Action.CommandAction *(class)*, 10–12
SCons.Action.CommandAction.execute *(method)*, 10, 16
SCons.Action.CommandAction.get_implicit_deps *(method)*, 10
SCons.Action.CommandAction.get_presig *(method)*, 10
SCons.Action.CommandAction.process *(method)*, 10, 16
SCons.Action.CommandAction.strfunction *(method)*, 10, 16
SCons.Action.CommandGeneratorAction *(class)*, 12–14
SCons.Action.CommandGeneratorAction.__call__ *(method)*, 12
SCons.Action.CommandGeneratorAction.get_implicit_deps *(method)*, 13, 16
SCons.Action.CommandGeneratorAction.get_presig *(method)*, 13
SCons.Action.default_exitstatfunc *(function)*, 7
SCons.Action.FunctionAction *(class)*, 17–19
SCons.Action.FunctionAction.execute *(method)*, 17
SCons.Action.FunctionAction.function_name *(method)*, 17
SCons.Action.FunctionAction.get_implicit_deps *(method)*, 17
SCons.Action.FunctionAction.get_presig *(method)*, 17
SCons.Action.FunctionAction.strfunction *(method)*, 17
SCons.Action.get_default_ENV *(function)*, 7
SCons.Action.LazyAction *(class)*, 14–17
SCons.Action.LazyAction.get_parent_class *(method)*, 14
SCons.Action.ListAction *(class)*, 19–21
SCons.Action.ListAction.__call__ *(method)*, 19
SCons.Action.ListAction.get_implicit_deps *(method)*, 19
SCons.Action.ListAction.get_presig *(method)*, 19
SCons.Action.remove_set_lineno_codes *(function)*, 7
SCons.Action.rfile *(function)*, 7
SCons.Conftest.CheckBuilder *(function)*, 44
SCons.Conftest.CheckCC *(function)*, 44
SCons.Conftest.CheckCXX *(function)*, 44
SCons.Conftest.CheckDeclaration *(function)*, 46
SCons.Conftest.CheckFunc *(function)*, 45
SCons.Conftest.CheckHeader *(function)*, 45
SCons.Conftest.CheckLib *(function)*, 46
SCons.Conftest.CheckSHCC *(function)*, 44
SCons.Conftest.CheckSHCXX *(function)*, 44
SCons.Conftest.CheckType *(function)*, 45
SCons.Conftest.CheckTypeSize *(function)*, 45
SCons.cpp.CPP_to_Python *(function)*, 605
SCons.cpp.CPP_to_Python_Ops_Sub *(function)*, 605
SCons.cpp.DumbPreProcessor *(class)*, 611–616
SCons.cpp.FunctionEvaluator *(class)*, 605–607
SCons.cpp.FunctionEvaluator.__call__ *(method)*, 606
SCons.cpp.PreProcessor *(class)*, 607–611
SCons.cpp.PreProcessor.__call__ *(method)*, 343, 607, 611
SCons.cpp.PreProcessor.all_include *(method)*, 344, 608, 612
SCons.cpp.PreProcessor.do_define *(method)*, 344, 608, 612
SCons.cpp.PreProcessor.do_elif *(method)*, 344, 608, 613
SCons.cpp.PreProcessor.do_else *(method)*, 344, 608, 613
SCons.cpp.PreProcessor.do_endif *(method)*, 344, 608, 613
SCons.cpp.PreProcessor.do_if *(method)*, 344, 608, 613
SCons.cpp.PreProcessor.do_ifdef *(method)*, 344, 609, 613
SCons.cpp.PreProcessor.do_ifndef *(method)*, 344, 609, 613
SCons.cpp.PreProcessor.do_import *(method)*, 344, 609, 613
SCons.cpp.PreProcessor.do_include *(method)*, 344, 345, 609, 613
SCons.cpp.PreProcessor.do_nothing *(method)*, 345, 609, 613
SCons.cpp.PreProcessor.do_undef *(method)*, 345, 609, 614
SCons.cpp.PreProcessor.eval_expression *(method)*, 345, 609, 614
SCons.cpp.PreProcessor.finalize_result *(method)*,

609, 614
SCons.cpp.PreProcessor.find_include_file *(method)*, 609, 614
SCons.cpp.PreProcessor.initialize_result *(method)*, 610, 614
SCons.cpp.PreProcessor.process_contents *(method)*, 345, 610, 614
SCons.cpp.PreProcessor.read_file *(method)*, 610, 614
SCons.cpp.PreProcessor.resolve_include *(method)*, 345, 610, 614
SCons.cpp.PreProcessor.restore *(method)*, 345, 610, 614
SCons.cpp.PreProcessor.save *(method)*, 345, 610, 615
SCons.cpp.PreProcessor.scons_current_file *(method)*, 346, 610, 615
SCons.cpp.PreProcessor.start_handling_includes *(method)*, 346, 610, 615
SCons.cpp.PreProcessor.stop_handling_includes *(method)*, 346, 610, 615
SCons.cpp.PreProcessor.tupleize *(method)*, 346, 611, 615
SCons.Defaults.chmod_func *(function)*, 50
SCons.Defaults.chmod_strfunc *(function)*, 50
SCons.Defaults.copy_func *(function)*, 50
SCons.Defaults.DefaultEnvironment *(function)*, 50
SCons.Defaults.delete_func *(function)*, 50
SCons.Defaults.delete_strfunc *(function)*, 50
SCons.Defaults.get_paths_str *(function)*, 50
SCons.Defaults.mkdir_func *(function)*, 50
SCons.Defaults.move_func *(function)*, 51
SCons.Defaults.NullCmdGenerator *(class)*, 52–53
SCons.Defaults.NullCmdGenerator.__call__ *(method)*, 52
SCons.Defaults.processDefines *(function)*, 51
SCons.Defaults.SharedFlagChecker *(function)*, 50
SCons.Defaults.SharedObjectEmitter *(function)*, 50
SCons.Defaults.StaticObjectEmitter *(function)*, 50
SCons.Defaults.touch_func *(function)*, 51
SCons.Defaults.Variable_Method_Caller *(class)*, 53–54
SCons.Defaults.Variable_Method_Caller.__call__ *(method)*, 53
SCons.Errors.BuildError *(class)*, 96–99
SCons.Errors.convert_to_BuildError *(function)*, 96
SCons.Errors.EnvironmentError *(class)*, 104–106
SCons.Errors.ExplicitExit *(class)*, 108–109
SCons.Errors.InternalError *(class)*, 99–101
SCons.Errors.MSVCError *(class)*, 106–108
SCons.Errors.StopError *(class)*, 102–104
SCons.Errors.UserError *(class)*, 101–102
SCons.Memoize.CountDict *(class)*, 136–137
SCons.Memoize.CountDict.__call__ *(method)*, 136
SCons.Memoize.Counter *(class)*, 133–134
SCons.Memoize.Counter.__cmp__ *(method)*, 133, 135, 136
SCons.Memoize.Counter.display *(method)*, 133, 135, 137
SCons.Memoize.CountValue *(class)*, 134–136
SCons.Memoize.CountValue.__call__ *(method)*, 135
SCons.Memoize.Dump *(function)*, 132
SCons.Memoize.EnableMemoization *(function)*, 132
SCons.Memoize.Memoized_Metaclass *(class)*, 138–140
SCons.Memoize.Memoizer *(class)*, 137–138
SCons.Node.Annotate *(function)*, 141
SCons.Node.BuildInfoBase *(class)*, 144–145
SCons.Node.BuildInfoBase.merge *(method)*, 145, 164, 219, 255, 276, 299
SCons.Node.classname *(function)*, 141
SCons.Node.do_nothing *(function)*, 141
SCons.Node.get_children *(function)*, 141
SCons.Node.ignore_cycle *(function)*, 141
SCons.Node.Node *(class)*, 145–156
SCons.Node.Node.add_dependency *(method)*, 146, 167, 188, 200, 227, 238, 262, 279
SCons.Node.Node.add_ignore *(method)*, 146, 167, 188, 201, 227, 238, 262, 279
SCons.Node.Node.add_prerequisite *(method)*, 146, 167, 188, 201, 227, 239, 262, 279
SCons.Node.Node.add_source *(method)*, 146, 167, 188, 201, 227, 239, 262, 279
SCons.Node.Node.add_to_implicit *(method)*, 146, 167, 188, 201, 227, 239, 262, 279
SCons.Node.Node.add_to_waiting_parents *(method)*, 146, 167, 188, 201, 227, 239, 262, 279
SCons.Node.Node.add_to_waiting_s_e *(method)*, 147, 168, 189, 201, 227, 239, 263, 279
SCons.Node.Node.add_wkid *(method)*, 147, 168, 189, 201, 227, 239, 263, 279
SCons.Node.Node.all_children *(method)*, 147, 168, 189, 201, 227, 239, 263, 280
SCons.Node.Node.alter_targets *(method)*, 147, 168, 189, 201, 280
SCons.Node.Node.build *(method)*, 147, 189, 201, 263
SCons.Node.Node.builder_set *(method)*, 147, 168, 189, 202, 227, 239, 280
SCons.Node.Node.built *(method)*, 147, 168, 189, 202, 227, 239, 263, 280
SCons.Node.Node.changed *(method)*, 147, 168, 189, 202, 227, 239, 263, 280

SCons.Node.Node.changed_since_last_build *(method)*, 148, 190
SCons.Node.Node.children *(method)*, 148, 168, 190, 202, 228, 240, 263, 280
SCons.Node.Node.children_are_up_to_date *(method)*, 148, 168, 190, 202, 228, 240, 264, 280
SCons.Node.Node.clear *(method)*, 148, 169, 190, 202, 228, 240, 264, 280
SCons.Node.Node.clear_memoized_values *(method)*, 149, 169, 191, 202, 228, 241, 264, 280
SCons.Node.Node.Decider *(method)*, 145, 166, 187, 199, 225, 237, 261, 278
SCons.Node.Node.del_binfo *(method)*, 149, 169, 191, 203, 228, 241, 264, 281
SCons.Node.Node.disambiguate *(method)*, 149, 169, 191, 228, 241, 264, 281
SCons.Node.Node.do_not_store_info *(method)*, 149, 169, 191, 203, 228, 241, 264, 281
SCons.Node.Node.env_set *(method)*, 149, 169, 191, 203, 228, 241, 264, 281
SCons.Node.Node.executor_cleanup *(method)*, 149, 169, 191, 203, 228, 241, 264, 281
SCons.Node.Node.exists *(method)*, 149, 169, 281
SCons.Node.Node.explain *(method)*, 149, 169, 191, 203, 229, 241, 264, 281
SCons.Node.Node.for_signature *(method)*, 149, 169, 281
SCons.Node.Node.get_abspath *(method)*, 149, 169, 281
SCons.Node.Node.get_binfo *(method)*, 149, 170, 191, 203, 229, 242, 265, 281
SCons.Node.Node.get_build_env *(method)*, 150, 170, 191, 203, 229, 242, 265, 282
SCons.Node.Node.get_build_scanner_path *(method)*, 150, 170, 191, 204, 229, 242, 265, 282
SCons.Node.Node.get_builder *(method)*, 150, 170, 191, 204, 229, 242, 265, 282
SCons.Node.Node.get_cachedir_csig *(method)*, 150, 170, 191, 204, 230, 243, 282
SCons.Node.Node.get_csig *(method)*, 150, 192, 204
SCons.Node.Node.get_env *(method)*, 150, 170, 192, 204, 230, 243, 265, 282
SCons.Node.Node.get_env_scanner *(method)*, 150, 170, 192, 204, 265, 282
SCons.Node.Node.get_executor *(method)*, 150, 170, 192, 204, 230, 243, 265, 282
SCons.Node.Node.get_found_includes *(method)*, 150, 170, 192, 204, 282
SCons.Node.Node.get_implicit_deps *(method)*, 150, 171, 192, 204, 230, 243, 265, 282
SCons.Node.Node.get_ninfo *(method)*, 151, 171, 192, 204, 230, 243, 265, 283
SCons.Node.Node.get_source_scanner *(method)*, 151, 171, 192, 205, 230, 244, 266, 283
SCons.Node.Node.get_state *(method)*, 151, 171, 192, 205, 230, 244, 266, 283
SCons.Node.Node.get_stored_implicit *(method)*, 151, 171, 192, 205, 230, 244, 283
SCons.Node.Node.get_stored_info *(method)*, 151, 171, 192, 205, 230, 244, 283
SCons.Node.Node.get_string *(method)*, 151, 171, 193, 205, 230, 244, 266, 283
SCons.Node.Node.get_subst_proxy *(method)*, 151, 172, 283
SCons.Node.Node.get_suffix *(method)*, 152, 172, 284
SCons.Node.Node.get_target_scanner *(method)*, 152, 172, 193, 205, 267, 284
SCons.Node.Node.has_builder *(method)*, 152, 153, 172, 173, 193, 194, 205, 207, 231, 246, 267, 268, 284, 285
SCons.Node.Node.has_explicit_builder *(method)*, 152, 172, 193, 206, 231, 246, 267, 284
SCons.Node.Node.is_derived *(method)*, 152, 173, 193, 206, 232, 247, 267, 284
SCons.Node.Node.is_literal *(method)*, 152, 173, 193, 206, 232, 247, 267, 284
SCons.Node.Node.is_up_to_date *(method)*, 153, 194, 206
SCons.Node.Node.make_ready *(method)*, 153, 194, 206, 232, 247
SCons.Node.Node.missing *(method)*, 153, 173, 194, 207, 232, 247, 268, 285
SCons.Node.Node.new_binfo *(method)*, 153, 173, 194, 207, 232, 248, 268, 285
SCons.Node.Node.new_ninfo *(method)*, 153, 173, 194, 233, 248, 268, 285
SCons.Node.Node.postprocess *(method)*, 153, 173, 194, 207, 233, 248, 268, 285
SCons.Node.Node.prepare *(method)*, 153, 173, 194, 207, 285
SCons.Node.Node.push_to_cache *(method)*, 154, 174, 195, 207, 233, 248, 285
SCons.Node.Node.remove *(method)*, 154, 174, 195, 208, 233, 249, 286
SCons.Node.Node.render_include_tree *(method)*, 154, 174, 195, 208, 233, 249, 268, 286
SCons.Node.Node.reset_executor *(method)*, 154, 174, 195, 208, 233, 249, 268, 286
SCons.Node.Node.retrieve_from_cache *(method)*, 154, 174, 195, 208, 233, 249, 286
SCons.Node.Node.rexists *(method)*, 154, 174, 286

SCons.Node.Node.scan *(method)*, 155, 175, 195, 208, 233, 249, 268, 286
SCons.Node.Node.scanner_key *(method)*, 155, 175, 196, 286
SCons.Node.Node.select_scanner *(method)*, 155, 175, 196, 208, 234, 250, 269, 286
SCons.Node.Node.set_always_build *(method)*, 155, 175, 196, 209, 234, 250, 269, 286
SCons.Node.Node.set_executor *(method)*, 155, 175, 196, 209, 234, 250, 269, 286
SCons.Node.Node.set_explicit *(method)*, 155, 175, 196, 209, 234, 250, 269, 287
SCons.Node.Node.set_nocache *(method)*, 155, 175, 196, 209, 234, 250, 269, 287
SCons.Node.Node.set_noclean *(method)*, 155, 175, 196, 209, 234, 250, 269, 287
SCons.Node.Node.set_precious *(method)*, 155, 175, 196, 209, 234, 250, 269, 287
SCons.Node.Node.set_specific_source *(method)*, 155, 175, 196, 209, 234, 250, 269, 287
SCons.Node.Node.set_state *(method)*, 155, 175, 196, 209, 234, 250, 269, 287
SCons.Node.Node.state_has_changed *(method)*, 155, 175, 196, 210, 235, 251, 270, 287
SCons.Node.Node.store_info *(method)*, 155, 175, 196, 210, 235, 251, 287
SCons.Node.Node.visited *(method)*, 155, 175, 196, 210, 235, 251, 287
SCons.Node.NodeInfoBase *(class)*, 142–144
SCons.Node.NodeInfoBase.convert *(method)*, 143, 162, 218, 253, 274
SCons.Node.NodeInfoBase.format *(method)*, 143, 162, 218, 253, 274
SCons.Node.NodeInfoBase.merge *(method)*, 143, 162, 218, 253, 274
SCons.Node.NodeInfoBase.update *(method)*, 143, 162, 218, 253, 274
SCons.Node.NodeList *(class)*, 156–157
SCons.Node.NodeList.__str__ *(method)*, 156
SCons.Node.Walker *(class)*, 157–159
SCons.Node.Walker.get_next *(method)*, 158
SCons.Node.Walker.is_done *(method)*, 158
SCons.Scanner.Dir.DirEntryScanner *(function)*, 352
SCons.Scanner.Dir.DirScanner *(function)*, 352
SCons.Scanner.Dir.do_not_scan *(function)*, 352
SCons.Scanner.Dir.only_dirs *(function)*, 352
SCons.Scanner.Dir.scan_in_memory *(function)*, 352
SCons.Scanner.Dir.scan_on_disk *(function)*, 352
SCons.Script.Interactive.interact *(function)*, 373
SCons.Script.Interactive.SConsInteractiveCmd *(class)*, 373–376
SCons.Script.Interactive.SConsInteractiveCmd.do_build *(method)*, 374
SCons.Script.Interactive.SConsInteractiveCmd.do_clean *(method)*, 374
SCons.Script.Interactive.SConsInteractiveCmd.do_EOF *(method)*, 374
SCons.Script.Interactive.SConsInteractiveCmd.do_exit *(method)*, 374
SCons.Script.Interactive.SConsInteractiveCmd.do_shell *(method)*, 374
SCons.Script.Interactive.SConsInteractiveCmd.do_version *(method)*, 374
SCons.Subst.CmdStringHolder *(class)*, 428–431
SCons.Subst.CmdStringHolder.escape *(method)*, 428
SCons.Subst.CmdStringHolder.is_literal *(method)*, 428
SCons.Subst.escape_list *(function)*, 424
SCons.Subst.Literal *(class)*, 425–427
SCons.Subst.Literal.escape *(method)*, 426
SCons.Subst.Literal.for_signature *(method)*, 426
SCons.Subst.Literal.is_literal *(method)*, 426
SCons.Subst.NLWrapper *(class)*, 431–433
SCons.Subst.NullNodeList *(class)*, 436–437
SCons.Subst.quote_spaces *(function)*, 424
SCons.Subst.raise_exception *(function)*, 424
SCons.Subst.scons_subst *(function)*, 424
SCons.Subst.scons_subst_list *(function)*, 424
SCons.Subst.scons_subst_once *(function)*, 425
SCons.Subst.SetAllowableExceptions *(function)*, 424
SCons.Subst.SpecialAttrWrapper *(class)*, 427–428
SCons.Subst.SpecialAttrWrapper.escape *(method)*, 427
SCons.Subst.SpecialAttrWrapper.for_signature *(method)*, 427
SCons.Subst.SpecialAttrWrapper.is_literal *(method)*, 427
SCons.Subst.subst_dict *(function)*, 424
SCons.Subst.Target_or_Source *(class)*, 434–436
SCons.Subst.Target_or_Source.__getattr__ *(method)*, 435
SCons.Subst.Targets_or_Sources *(class)*, 433–434
SCons.Subst.Targets_or_Sources.__getattr__ *(method)*, 433
SCons.Subst.Targets_or_Sources.__str__ *(method)*, 433
SCons.Util._NoError *(class)*, 471–473
SCons.Util.AddMethod *(function)*, 463
SCons.Util.adjustixes *(function)*, 462
SCons.Util.AppendPath *(function)*, 462
SCons.Util.case_sensitive_suffixes *(function)*, 462

SCons.Util.CLVar *(class)*, 475–477
SCons.Util.CLVar.__coerce__ *(method)*, 475
SCons.Util.CLVar.__str__ *(method)*, 475
SCons.Util.containsAll *(function)*, 459
SCons.Util.containsAny *(function)*, 459
SCons.Util.containsOnly *(function)*, 459
SCons.Util.Delegate *(class)*, 470–471
SCons.Util.Delegate.__get__ *(method)*, 470
SCons.Util.dictify *(function)*, 459
SCons.Util.DisplayEngine *(class)*, 466–468
SCons.Util.DisplayEngine.__call__ *(method)*, 467
SCons.Util.DisplayEngine.set_mode *(method)*, 467
SCons.Util.do_flatten *(function)*, 460
SCons.Util.flatten *(function)*, 460
SCons.Util.flatten_sequence *(function)*, 461
SCons.Util.get_environment_var *(function)*, 459
SCons.Util.get_native_path *(function)*, 462
SCons.Util.IDX *(function)*, 460
SCons.Util.is_Dict *(function)*, 460
SCons.Util.is_List *(function)*, 460
SCons.Util.is_Scalar *(function)*, 460
SCons.Util.is_Sequence *(function)*, 460
SCons.Util.is_String *(function)*, 460
SCons.Util.is_Tuple *(function)*, 460
SCons.Util.LogicalLines *(class)*, 480–481
SCons.Util.LogicalLines.readline *(method)*, 480
SCons.Util.LogicalLines.readlines *(method)*, 480
SCons.Util.make_path_relative *(function)*, 463
SCons.Util.MD5collect *(function)*, 464
SCons.Util.MD5filesignature *(function)*, 464
SCons.Util.MD5signature *(function)*, 464
SCons.Util.NodeList *(class)*, 465–466
SCons.Util.NodeList.__call__ *(method)*, 465
SCons.Util.NodeList.__getattr__ *(method)*, 465
SCons.Util.NodeList.__iter__ *(method)*, 465
SCons.Util.NodeList.__nonzero__ *(method)*, 465
SCons.Util.NodeList.__str__ *(method)*, 465
SCons.Util.Null *(class)*, 484–486
SCons.Util.Null.__call__ *(method)*, 420, 422, 484, 486
SCons.Util.Null.__getattr__ *(method)*, 420, 422, 436, 485, 486
SCons.Util.Null.__nonzero__ *(method)*, 421, 422, 437, 485, 486
SCons.Util.NullSeq *(class)*, 486–487
SCons.Util.NullSeq.__delitem__ *(method)*, 436, 486
SCons.Util.NullSeq.__getitem__ *(method)*, 436, 486
SCons.Util.NullSeq.__iter__ *(method)*, 437, 486
SCons.Util.NullSeq.__len__ *(method)*, 437, 486
SCons.Util.NullSeq.__setitem__ *(method)*, 437, 486
SCons.Util.OrderedDict *(class)*, 477–478
SCons.Util.PrependPath *(function)*, 461
SCons.Util.print_tree *(function)*, 460
SCons.Util.Proxy *(class)*, 468–470
SCons.Util.Proxy.__cmp__ *(method)*, 39, 183, 469
SCons.Util.Proxy.__getattr__ *(method)*, 39, 469
SCons.Util.Proxy.get *(method)*, 40, 183, 469
SCons.Util.RegGetValue *(function)*, 461
SCons.Util.RegOpenKeyEx *(function)*, 461
SCons.Util.RenameFunction *(function)*, 463
SCons.Util.render_tree *(function)*, 459
SCons.Util.rightmost_separator *(function)*, 459
SCons.Util.Selector *(class)*, 478–480
SCons.Util.Selector.__call__ *(method)*, 478
SCons.Util.semi_deepcopy *(function)*, 461
SCons.Util.silent_intern *(function)*, 464
SCons.Util.Split *(function)*, 462
SCons.Util.splitext *(function)*, 459
SCons.Util.to_String *(function)*, 461
SCons.Util.to_String_for_signature *(function)*, 461
SCons.Util.to_String_for_subst *(function)*, 461
SCons.Util.Unbuffered *(class)*, 483–484
SCons.Util.Unbuffered.__getattr__ *(method)*, 483
SCons.Util.Unbuffered.write *(method)*, 483
SCons.Util.unique *(function)*, 463
SCons.Util.UniqueList *(class)*, 481–483
SCons.Util.uniquer *(function)*, 463
SCons.Util.uniquer_hashables *(function)*, 463
SCons.Util.updrive *(function)*, 459
SCons.Util.WhereIs *(function)*, 461
SCons.Util.WindowsError *(class)*, 473–475
SCons.Warnings.CacheWriteErrorWarning *(class)*, 503–505
SCons.Warnings.CorruptSConsignWarning *(class)*, 505–507
SCons.Warnings.DependencyWarning *(class)*, 507–509
SCons.Warnings.DeprecatedBuildDirWarning *(class)*, 549–551
SCons.Warnings.DeprecatedBuilderKeywordsWarning *(class)*, 565–566
SCons.Warnings.DeprecatedCopyWarning *(class)*, 553–555
SCons.Warnings.DeprecatedDebugOptionsWarning *(class)*, 561–563
SCons.Warnings.DeprecatedOptionsWarning *(class)*, 555–557
SCons.Warnings.DeprecatedSigModuleWarning *(class)*, 563–565
SCons.Warnings.DeprecatedSourceCodeWarning *(class)*, 547–549
SCons.Warnings.DeprecatedSourceSignaturesWarning *(class)*, 557–559

SCons.Warnings.DeprecatedTargetSignaturesWarning *(class)*, 559–561
SCons.Warnings.DeprecatedWarning *(class)*, 541–543
SCons.Warnings.DuplicateEnvironmentWarning *(class)*, 509–511
SCons.Warnings.enableWarningClass *(function)*, 498
SCons.Warnings.FortranCxxMixWarning *(class)*, 537–539
SCons.Warnings.FutureDeprecatedWarning *(class)*, 539–541
SCons.Warnings.FutureReservedVariableWarning *(class)*, 511–513
SCons.Warnings.LinkWarning *(class)*, 513–515
SCons.Warnings.MandatoryDeprecatedWarning *(class)*, 543–545
SCons.Warnings.MisleadingKeywordsWarning *(class)*, 515–517
SCons.Warnings.MissingSConscriptWarning *(class)*, 517–519
SCons.Warnings.NoMD5ModuleWarning *(class)*, 519–521
SCons.Warnings.NoMetaclassSupportWarning *(class)*, 521–523
SCons.Warnings.NoObjectCountWarning *(class)*, 523–525
SCons.Warnings.NoParallelSupportWarning *(class)*, 525–527
SCons.Warnings.process_warn_strings *(function)*, 498
SCons.Warnings.PythonVersionWarning *(class)*, 545–547
SCons.Warnings.ReservedVariableWarning *(class)*, 527–529
SCons.Warnings.StackSizeWarning *(class)*, 529–531
SCons.Warnings.suppressWarningClass *(function)*, 498
SCons.Warnings.TaskmasterNeedsExecuteWarning *(class)*, 551–553
SCons.Warnings.VisualCMissingWarning *(class)*, 531–533
SCons.Warnings.VisualStudioMissingWarning *(class)*, 535–537
SCons.Warnings.VisualVersionMismatch *(class)*, 533–535
SCons.Warnings.warn *(function)*, 498
SCons.Warnings.Warning *(class)*, 499–501
SCons.Warnings.warningAsException *(function)*, 498
SCons.Warnings.WarningOnByDefault *(class)*, 501–503

threading.Thread.getName *(function)*, 127
threading.Thread.isAlive *(function)*, 127
threading.Thread.isDaemon *(function)*, 127
threading.Thread.join *(function)*, 127
threading.Thread.setDaemon *(function)*, 127
threading.Thread.setName *(function)*, 127
threading.Thread.start *(function)*, 127
type.__call__ *(function)*, 139
type.__cmp__ *(function)*, 139
type.__subclasses__ *(function)*, 140
type.mro *(function)*, 140

UserDict.UserDict.__cmp__ *(function)*, 27, 29, 30, 33, 59, 160, 477, 478
UserDict.UserDict.__contains__ *(function)*, 27, 29, 30, 33, 59, 160, 478
UserDict.UserDict.__delitem__ *(function)*, 33, 160
UserDict.UserDict.__getitem__ *(function)*, 27, 29, 30, 34, 60, 160, 478
UserDict.UserDict.__init__ *(function)*, 160
UserDict.UserDict.__len__ *(function)*, 27, 29, 30, 34, 60, 160, 478, 479
UserDict.UserDict.__repr__ *(function)*, 27, 29, 30, 34, 60, 160, 478, 479
UserDict.UserDict.__setitem__ *(function)*, 34, 160
UserDict.UserDict.clear *(function)*, 34, 60, 160
UserDict.UserDict.copy *(function)*, 34, 60, 160
UserDict.UserDict.fromkeys *(class method)*, 28, 29, 31, 34, 60, 161, 478, 479
UserDict.UserDict.get *(function)*, 28, 29, 31, 34, 60, 161, 478, 479
UserDict.UserDict.has_key *(function)*, 28, 29, 31, 34, 60, 161, 478, 479
UserDict.UserDict.items *(function)*, 34, 60, 161
UserDict.UserDict.iteritems *(function)*, 28, 29, 31, 34, 60, 161, 478, 479
UserDict.UserDict.iterkeys *(function)*, 28, 29, 31, 34, 60, 161, 478, 479
UserDict.UserDict.itervalues *(function)*, 28, 29, 31, 34, 60, 161, 478, 479
UserDict.UserDict.keys *(function)*, 34, 60, 161
UserDict.UserDict.pop *(function)*, 28, 29, 31, 34, 60, 161, 478, 479
UserDict.UserDict.popitem *(function)*, 34, 60, 161
UserDict.UserDict.setdefault *(function)*, 34, 60, 161
UserDict.UserDict.update *(function)*, 34, 161
UserDict.UserDict.values *(function)*, 34, 60, 161
UserList.UserList.__add__ *(function)*, 32, 112, 156, 370, 433, 465
UserList.UserList.__cmp__ *(function)*, 32, 112, 156, 370, 433, 465, 475
UserList.UserList.__contains__ *(function)*, 32, 112, 156, 370, 433, 465, 475, 482
UserList.UserList.__delitem__ *(function)*, 32, 112, 156, 370, 433, 465, 475, 483

UserList.UserList.__delslice__ *(function)*, 32, 112, 156, 370, 433, 465, 475, 483
UserList.UserList.__eq__ *(function)*, 32, 112, 156, 370, 433, 465, 476
UserList.UserList.__ge__ *(function)*, 32, 112, 156, 370, 433, 465, 476
UserList.UserList.__getitem__ *(function)*, 32, 156, 370, 465, 476
UserList.UserList.__getslice__ *(function)*, 32, 156, 370, 465, 476
UserList.UserList.__gt__ *(function)*, 32, 112, 156, 371, 433, 465, 476
UserList.UserList.__iadd__ *(function)*, 32, 112, 156, 371, 433, 465, 476
UserList.UserList.__imul__ *(function)*, 32, 112, 157, 371, 434, 465, 476
UserList.UserList.__init__ *(function)*, 32, 157, 371, 466
UserList.UserList.__le__ *(function)*, 32, 112, 157, 371, 434, 466, 476
UserList.UserList.__len__ *(function)*, 32, 112, 157, 371, 434, 466, 476
UserList.UserList.__lt__ *(function)*, 32, 113, 157, 371, 434, 466, 476
UserList.UserList.__ne__ *(function)*, 32, 113, 157, 371, 434, 466, 476
UserList.UserList.__radd__ *(function)*, 32, 113, 157, 371, 434, 466
UserList.UserList.__repr__ *(function)*, 32, 157, 371, 466, 476, 483
UserList.UserList.__rmul__ *(function)*, 32, 113, 157, 371, 434, 466, 476
UserList.UserList.__setitem__ *(function)*, 33, 113, 157, 371, 434, 466, 476
UserList.UserList.__setslice__ *(function)*, 33, 113, 157, 371, 434, 466, 476
UserList.UserList.append *(function)*, 33, 113, 157, 371, 434, 466, 476
UserList.UserList.count *(function)*, 33, 113, 157, 371, 434, 466, 476
UserList.UserList.extend *(function)*, 33, 113, 157, 371, 434, 466, 476
UserList.UserList.index *(function)*, 33, 113, 157, 371, 434, 466, 476
UserList.UserList.insert *(function)*, 33, 113, 157, 371, 434, 466, 476
UserList.UserList.pop *(function)*, 33, 113, 157, 371, 434, 466, 476, 483
UserList.UserList.remove *(function)*, 33, 113, 157, 371, 434, 466, 476, 483
UserList.UserList.reverse *(function)*, 33, 113, 157, 371, 434, 466, 477
UserList.UserList.sort *(function)*, 33, 113, 157, 371, 434, 466, 477
UserString.UserString.__add__ *(function)*, 429
UserString.UserString.__cmp__ *(function)*, 429
UserString.UserString.__complex__ *(function)*, 429
UserString.UserString.__contains__ *(function)*, 429
UserString.UserString.__float__ *(function)*, 429
UserString.UserString.__getitem__ *(function)*, 429
UserString.UserString.__getslice__ *(function)*, 429
UserString.UserString.__hash__ *(function)*, 429
UserString.UserString.__int__ *(function)*, 429
UserString.UserString.__len__ *(function)*, 429
UserString.UserString.__long__ *(function)*, 429
UserString.UserString.__mod__ *(function)*, 429
UserString.UserString.__radd__ *(function)*, 429
UserString.UserString.__repr__ *(function)*, 429
UserString.UserString.__rmul__ *(function)*, 429
UserString.UserString.__str__ *(function)*, 429
UserString.UserString.capitalize *(function)*, 429
UserString.UserString.center *(function)*, 429
UserString.UserString.count *(function)*, 429
UserString.UserString.decode *(function)*, 430
UserString.UserString.encode *(function)*, 430
UserString.UserString.endswith *(function)*, 430
UserString.UserString.expandtabs *(function)*, 430
UserString.UserString.find *(function)*, 430
UserString.UserString.index *(function)*, 430
UserString.UserString.isalnum *(function)*, 430
UserString.UserString.isalpha *(function)*, 430
UserString.UserString.isdecimal *(function)*, 430
UserString.UserString.isdigit *(function)*, 430
UserString.UserString.islower *(function)*, 430
UserString.UserString.isnumeric *(function)*, 430
UserString.UserString.isspace *(function)*, 430
UserString.UserString.istitle *(function)*, 430
UserString.UserString.isupper *(function)*, 430
UserString.UserString.join *(function)*, 430
UserString.UserString.ljust *(function)*, 430
UserString.UserString.lower *(function)*, 430
UserString.UserString.lstrip *(function)*, 430
UserString.UserString.partition *(function)*, 430
UserString.UserString.replace *(function)*, 430
UserString.UserString.rfind *(function)*, 430
UserString.UserString.rindex *(function)*, 430
UserString.UserString.rjust *(function)*, 431
UserString.UserString.rpartition *(function)*, 431
UserString.UserString.rsplit *(function)*, 431
UserString.UserString.rstrip *(function)*, 431
UserString.UserString.split *(function)*, 431
UserString.UserString.splitlines *(function)*, 431
UserString.UserString.startswith *(function)*, 431

UserString.UserString.strip *(function)*, 431
UserString.UserString.swapcase *(function)*, 431
UserString.UserString.title *(function)*, 431
UserString.UserString.translate *(function)*, 431
UserString.UserString.upper *(function)*, 431
UserString.UserString.zfill *(function)*, 431