SOMobjects Base Toolkit

Quick Reference Guide

Syntax reference for the classes, methods, functions, macros and SOM Compiler in the base capabilities of the System Object Model and its basic frameworks

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SOM Compiler Quick Reference

SOM Compiler ‘sc’ command

Usage:

sc [–C:D:E:I:S:U:V:c:d:h:i:m:p:r:s:u:v:w] f1 f2 ...	Compiles the specified .idl file(s) and produces binding files as the options, –m modifiers, and environment variables direct.

where:

–C <n>	Sets size of comment buffer (default: 32767).
–D <DEFINE>	Has same effect as –D option for cpp.
–E <var>=<value>	Sets an environment variable.
–I <INCLUDE>	Has same effect as –I option for cpp.
–S <n>	Sets size of string buffer (default: 32767)
–U <UNDEFINE>	Has same effect as –U option for cpp.
–V	Show version number of compiler.
–c	Ignore all comments.
–d <dir>	Send output to directory for each emitted file.
–h	Displays a listing of this option list.
–i <file>	Use filename as specified (not a default .idl file).
–m <name[=value]>	Adds a global modifier (see valid Modifiers, below).
–p	Denotes shorthand for the option –D__PRIVATE__.
–r	Check release order entries exist (default: FALSE).
–s <string>	Replaces SMEMIT variable with <string>.
–u	Updates Interface Repository.
–v	Sets verbose debugging mode (default: FALSE).
–w	Don’t display warnings (default: FALSE).

Modifiers for –m option

addprefixes	Adds ‘functionprefix’ to method names in the template file.
addstar	Adds ‘*’ to C bindings for interface references.
corba	Checks the source for CORBA compliance.
csc	Forces running of the OIDL compiler.
emitappend	Appends the emitted files at the end of the existing file.
noheader	Don’t add a header to the emitted file.
noint	Don’t warn about “int” causing portability problems.

nolock	Don’t lock the IR during update.
nopp	Don’t run the source through the pre-processor.
notc	Don’t use typecodes for emit information.
nouseshort	Don’t generate short names for types
pp=<path>	Specifies a local pre-processor to use.
tcconsts	Generate CORBA TypeCode constants.

Note: All command-line modifiers can be set in the environment by changing them to UPPERCASE and prepending “SM” to them.

Environment variables

SMEMIT=[h; ih; c; xh; xih; xc; def; ir; pdl]	Determines which emitters to run (default: h; ih).
SMINCLUDE=<dir1>[;<dir2>]+	Determines where to search for .idl and .efw files.
SMKNOWNEXTS=ext[;ext]+	Adds headers to user-written emitters.
SMTMP=<dir>	Sets a directory to hold intermediate files.
SOMIR=<path>[;<path>]+	Gives a list of Interface Repositories to search.

Pragmas

#pragma somemittypes on	Turns on emission of global types.
#pragma somemittypes off	Turns off emission of global types.
#pragma modifier <modifier stm>;	Use this statement instead of the definition for the same ‘modifier’ in the implementation section of the .idl file.

Other commands

pdl –d<dir> ***.idl**	Install public versions of the .idl files in the indicated directory.
ctoi *.csc	Convert file from .csc to .idl. (See Appendix B of the *SOMobjects Developer Toolkit Users Guide*.)

SOM Kernel Quick Reference

Class Organization

SOMObject — The root class for all SOM objects.
Provides behavior (methods) common to all SOM objects.

SOMClass metaclass — The root class of all SOM metaclasses.
Defines the essential behavior (methods) common to all SOM classes.

SOMClassMgr — An instance of SOMClassMgr is created automatically during SOM initialization. It acts as a run-time registry for all SOM class objects and assists with dynamic loading and unloading of class libraries.

Functions

(see somapi.h)

Note: function prototypes are given using C syntax, assuming the type environment created by:
#include <som.h>

boolean **somApply**(SOMObject objPtr, somToken *retVal, somMethodDataPtr mdPtr, va_list args);	Invokes (on the object pointed to by objPtr) the apply stub for the method described by the indicated somMethodData structure. The result of the method invocation is stored in the memory location pointed to by retVal (which cannot be null). The va_list must include objPtr as its first entry.
void **somBeginPersistentIds** ();	Tells SOM to begin a “persistent ID interval.”
void **somBuildClass**(unsigned long inheritVars, somStaticClassInfoPtr sciPtr, long majorVersion, long minorVersion);	Automates the process of building a new SOM class object; used by C and C++ implementation bindings.
somId **somCheckId** (somId id);	Registers a som ID.
somMethodPtr **somClassResolve** (SOMClass clsPtr, somMToken mToken);	Obtains a pointer to the procedure that implements a static method for instances of a particular SOM class.
boolean **somCompareIds** (somId id1, somId id2);	Determines whether two SOM IDs represent the same string. Returns true (1) if they are the same and false (0) otherwise.
somToken **somDataResolve** (SOMObject objPtr, somDToken dToken);	Supports access to instance data within an object. Used by C and C++ implementation bindings.

void **somEndPersistentIds** ();	Tells SOM to end a “persistent ID interval.”
SOMClassMgr **somEnvironmentNew** ();	Initializes the SOM runtime environment.
void **somExceptionFree** (Environment *ev);	Frees the memory held by the Exception structure within an Environment structure.
string **somExceptionId** (Environment *ev);	Gets the name of the exception contained in an Environment structure.
somToken **somExceptionValue** (Environment *ev);	Gets the value of the exception contained in an Environment structure.
Environment ***somGetGlobalEnvironment** ();	Returns a pointer to the current global Environment structure.
somId **somIdFromString** (string aString);	Returns the SOM ID corresponding to a given text string.
boolean **somIsObj** (somToken memPtr);	Failsafe routine to determine whether a pointer references a valid SOM object.
long **somLPrintf** (long level, string fmt, ...);	Prints a formatted string in the manner of the C printf function, at the specified indentation level.
somMethodPtr **somParentNumResolve** (somMethodTabs parentMtabs, long parentNum, somMToken mToken);	Obtains a pointer to a procedure that implements the static method identified by mToken. Used by C and C++ implementation bindings to support parent method calls for multiple–inheritance classes.
somMethodPtr **somParentResolve** (somMethodTabs parentMtab, somMToken mToken);	Obtains a pointer to the procedure that implements the static method identified by mToken. Used by old binaries to support parent method calls for single inheritance classes.
void **somPrefixLevel** (long level);	Outputs blanks to prefix a line at the indicated level.
long **somPrintf** (string fmt, ...);	Prints a formatted string in the manner of the C printf function.
boolean **somRegisterId** (somId id);	Registers a SOM ID and determines whether or not it was previously registered.
somMethodPtr **somResolve** (SOMObject objPtr, somMToken mToken);	Obtains a pointer to the procedure that implements the static method identified by mToken for a particular SOM object.
somMethodPtr **somResolveByName** (SOMObject objref, string methodName);	Obtains a pointer to the procedure that implements a (static or dynamic) method for a particular SOM object.
void **somSetException** (Environment *ev, enum exception_type major, string exceptionName, somToken params);	Sets an exception value in an Environment structure.
void **somSetExpectedIds** (unsigned long numIds);	Tells SOM how many unique SOM IDs a client program expects to use.
string **somStringFromId** (somId id);	Returns the string that a SOM ID represents.

unsigned long **somTotalRegIds** ();	Returns the total number of SOM IDs that have been registered.
unsigned long **somUniqueKey** (somID id);	Returns the unique key associated with a SOM ID.
long **somVprintf** (string fmt, va_list ap);	Prints a formatted string in the manner of the C vprintf function.
somToken **(*SOMCalloc)** (size_t num, size_t size);	Allocates sufficient zeroed memory for an array of objects of a specified size. Replaceable.
string **(*SOMClassInitFuncName)** ( );	Returns the name of the function used to initialize classes in a DLL. Replaceable.
long **(*SOMDeleteModule)** (somToken modHandle);	Unloads a dynamically linked library (DLL). Replaceable.
void **(*SOMError**) (int errorCode, string fileName, int lineNum);	Handles an error condition. Replaceable.
void **(*SOMFree)** (somToken memPtr);	Frees the specified block of memory. Replaceable.
long **(*SOMLoadModule)** (string className, string fileName, string functionName, long majorVersion, long minorVersion, somToken *modHandle);	Loads the dynamically linked library (DLL) containing a SOM class. Replaceable.
somToken **(*SOMMalloc)** (size_t size);	Allocates the specified amount of memory. Replaceable.
int **(*SOMOutCharRoutine)** (char c);	Prints a character. Replaceable.
somToken **(*SOMRealloc)** (void *ptr, size_t size);	Changes the size of a previously allocated region of memory. Replaceable.

C/C++ Macros

(see somcdev.h)
Note: Macro arguments are given using C argument declaration syntax for arguments that are C expressions (e.g., “string className” denotes an argument expression that evaluates to a char* value in C), whereas macro arguments that are simply tokens manipulated by the preprocessor in order to create C expressions are identified with the prefix <token>.

SOM_Assert (boolean expression, long errorCode);	Asserts that a boolean condition is true — i.e., a C/C++ expression evaluates to a non–zero value.
Environment ***** **SOM_CreateLocalEnvironment** ();	Creates and initializes a local Environment structure that can be passed to methods as the Environment argument.
SOM_DestroyLocalEnvironment (Environment * ev);	Destroys a local Environment structure; calls somExceptionFree and SOMFree.
SOM_Error (long errorCode);	Reports an error condition.
SOM_Expect (boolean expression);	Asserts that a boolean condition is expected to be true.

SOMClass **SOM_GetClass** (SOMObject objPtr);	Returns a pointer to the class object of which a SOM object is an instance. Invokes no methods.
SOM_InitEnvironment (Environment * ev);	Initializes a locally declared Environment structure that can be passed to methods as the Environment argument.
SOM_NoTrace (<token> className, <token> methodName);	Used to turn off method debugging. The macro arguments are not C/C++ expressions, but simply text used by the preprocessor to create expressions.
SOM_ParentNumResolve(<token> className, long parentNum, somMethodTabs mtabs, <token> methodName);	Used by C and C++ implementation bindings to implement parent method calls.
SOM_Resolve (SOMObject objPtr, <token> className, <token> methodName);	Obtains a pointer to a static method procedure.
SOM_ResolveNoCheck (SOMObject objPtr <token> className, <token> methodName);	Obtains a pointer to a static method procedure.
SOM_Test (boolean expression);	Tests whether a boolean condition is true; if not, a fatal error is raised.
SOM_TestC (boolean expression);	Tests whether a boolean condition is true; if not, a warning message is output.
SOM_UninitEnvironment (Environment * ev);	Uninitializes a local Environment structure; calls somExceptionFree (but *not* SOMFree).
SOM_WarnMsg (string msg);	Reports a warning message.

SOMClass class

(see somcls.idl)
Note: All following method prototypes for the SOM kernel classes are expressed using IDL syntax for OIDL callstyle methods. That is, the receiver of the method is implicit, and the two possible CORBA implicit arguments (environment and context) are not passed. For example, to call the _get_somInstanceDataOffsets method from C (assuming an #include <somcls.h>) the following prototype specifies that a programmer could write the statement: __get_somInstanceDataOffsets(classPtr).

somOffsets **_get_somInstanceDataOffsets**();	Returns a sequence of structures, each of which indicates aclass and the offset to the beginning of the instance data introduced by the indicated class in an instance of the receiver class.
somMToken **somAddStaticMethod** (in somId methodId, in somId methodDescriptor, in somMethodPtr method, in somMethodPtr redispatchStub, in somMethodPtr applyStub);	Adds a new static instance method to a class. (A static method is any method included in the OIDL or IDL declaration of a class.)
string **somAllocate**(in long size);	Allocates the requested amount of memory, and returns a pointer to the allocated region.

boolean **somCheckVersion** (In long majorVersion, In long minorVersion);	Checks a class for compatibility with the specified major and minor version numbers.
void **somClassReady** ();	Indicates that a class has been constructed and is ready for normal use.
void **somDeallocate**(in string memPtr);	The dual to somAllocate, this method deallocates the indicated memory region.
boolean **somDescendedFrom** (in SOMClass clsPtr);	Tests whether aclass is derived from the receiving class.
boolean **somFindMethod** (in somId methodId, out somMethodPtr m);	Finds the method procedure that implements the indicated method for a class of objects, and indicates whether the method is a static.
boolean **somFindMethodOk** (in somId methodId, out somMethodPtr *m);	As above; but if the method is not supported, this method raises an error and halts execution.
somMethodPtr **somFindSMethod** (in somId methodId);	Finds the method procedure for a static method.
somMethodPtr **somFindSMethodOk** (in somId methodId);	Like somFindSmethod; but if the desired static method is not supported, an error is raised and execution is halted.
somMethodPtr **somGetApplyStub**(receiver, in somId methodId);	Obsolete; retained for binary compatibility. Use function somApply instead.
somClassDataStructurePtr **somGetClassData** ();	Obtains a pointer to the global structure <*className*>ClassData associated with the receiving class.
somMethodTabPtr **somGetClassMtab** ( );	Returns a pointer to the receiving class's method table.
long **somGetInstanceOffset** ();	Returns the offset to the instance variables of a class in all object instances of the class.
long **somGetInstancePartSize** ();	Returns the size of the instance variables introduced by a class, in all instances of that class.
long **somGetInstanceSize** ();	Returns the size of an instance of a class.
somDToken **somGetInstanceToken** ();	Returns a token for the instance data introduced by a class.
somDToken **somGetMemberToken** (long memberOffset, somDToken instanceToken);	Returns an access token for an instance variable.
boolean **somGetMethodData**(in somId methodId, out somMethodData md);	Get the method data for the indicated method, which must have been introduced by the receiver or an ancestor of the receiver.
somId **somGetMethodDescriptor** (somId methodid);	Returns the method descriptor for a method.
long **somGetMethodIndex**(in somId methodid);	Returns the index for the specified method. Can be used as input to somGetNthMethodData.

long **somGetMethodOffset**(in somId methodId);	Obtains the offset within the method table of an instance of the receiver class to the somMethodPtr for an indicated static method. This offset is not necessarily valid for a subclass of the receiver.
somMToken **somGetMethodToken** (somId methodId);	Returns a static method access token.
string **somGetName** ();	Obtains the name of the receiving class.
boolean **somGetNthMethodData**(in long n, out somMethodData md);	Loads the somMethodData structure whose address is passed with information describing the nth (static or dynamic) method introduced by the receiver class. Also, see somGetNumMethods and somGetNumStaticMethods.
somId **somGetNthMethodInfo** in long n, out somId descriptor);	Returns the method id of the nth (static or dynamic) method introduced by this class. Also loads the location pointed to by the passed descriptor address with a somId for the method descriptor.
int **somGetNumMethods** ();	Obtains the number of methods available for a class.
int **somGetNumStaticMethods** ();	Obtains the number of static methods available for a class.
SOMClass **somGetParent** ();	Obsolete. Returns a pointer to the leftmost parent of the receiver class.
SOMClassSequence **somGetParents** ();	Returns a sequence containing pointers to the parents of the receiver class.
somMethodTabs **somGetPClsMtab** ();	Obsolete.
somMethodTabs **somGetPClsMtabs** ();	Returns a pointer to a list of the method tables of a class's parent (base) classes.
somMethodPtr **somGetRdStub**(in somId methodId);	Gets a redispatch stub for the indicated static method.
void **somGetVersionNumbers** (out long *majorVersion, out long *minorVersion);	Gets the major and minor version numbers of the receiving class's implementation code.
void **somInitClass** (in string className, in SOMClass parentClass, in long instanceSize, in long maxStaticMethods, in long majorVersion, in long minorVersion);	Initializes a newly created class object (for a class having a single parent).
void **somInitMIClass** (in unsigned long inherit_vars, in string className, in SOMClassSequence parentClasses, in long instanceSize, in long maxStaticMethods, in long majorVersion, in long minorVersion);	Initializes a newly created class object (for a class having multiple parents).

somMethodPtr **somLookupMethod**(somId methodId);	Like somFindSMethodOk except dynamic methods may be returned. Used by bindings for name–lookup resolution.
SOMObject **somNew** ();	Creates a new instance of the receiving class and calls somInit to initialize it.
SOMObject **somNewNoInit** ();	Creates a new instance of a class, but does not initialize it.
void **somOverrideMtab** ();	Replaces the method procedure pointers in a class's instance method table with pointers to the corresponding method redispatch stubs. (The method procedure pointer for the method somDispatch, however, is left unchanged.)
void **somOverrideSMethod** (inout somId methodId, in somMethodPtr method);	Adds an overriding method to a class.
SOMObject **somRenew** (in somToken memPtr);	Creates a new object instance of the receiver class in the indicated memory location. Zeros memory, and calls somInit to re-initialize the object.
SOMObject **somRenewNoInit** (in somToken memPtr);	Like somRenew, but does *not* call somInit to initialize it.
SOMObject **somRenewNoZero**(in somToken memPtr);	Like somRenew, but does not zero memory.
SOMObject **somRenewNoInitNoZero**(in somToken memPtr);	Like somRenew, but does not call init and does not zero memory.
void **somSetClassData** (in somClassDataStructurePtr classDataPtr);	Sets a class's pointer to its global ClassData structure.
boolean **somSetMethodDescriptor**(in somId methodId, in somId descriptor);	Sets a class's descriptor for the indicated method. Returns true if successful, or false if the class doesn't know of the indicated method.
boolean **somSupportsMethod** (inout somId methodId);	Indicates whether instances of a given class supports a given method.

SOMClassMgr class

(see somcm.idl)
Note: Method prototypes for the SOM kernel classes are expressed using IDL syntax for OIDL callstyle methods. That is, the receiver of the method is implicit, and the two possible CORBA implicit arguments (environment and context) are not passed.

SOMClass **somClassFromId** (in somId classId);	Finds a class object, given its ID, if it already exists. Does not load the class.
SOMClass **somFindClass** (in somId classId, in long majorVersion, in long minorVersion);	Finds a class object, given its ID. If necessary, loads the class and initializes it.
SOMClass **somFindClsInFile** (in somId classId, in long majorVersion, in long minorVersion, in string file);	Finds a class object for a class when the correct file is known beforehand. If necessary, loads the class and initializes it.
string **somGetInitFunction** ();	Obtains the name of the function that initializes the SOM classes in a shared library.
SOMObject **somGetInterfaceRepository** ();	Returns the Repository object that provides access to the Interface Repository.
SOMClass ***somGetRelatedClasses** (in SOMClass classObj);	Returns an array of class objects that were all registered during the dynamic loading of a class.
SOMClass **somLoadClassFile** (inout somId classId, in long majorVersion, in long minorVersion, in string fileName);	Dynamically loads a class.
string **somLocateClassFile** (in somId classId, in long majorVersion, in long minorVersion);	Determines the file that holds a class to be dynamically loaded.
void **somMergeInto** (in SOMClassMgr target);	Transfers SOM class registry to another SOMClassMgr instance.
void **somRegisterClass** (in SOMClass classObj);	Adds a class object to the SOM run-time class registry.
void **somSetInterfaceRepository** (SOMObject repositoryObj);	Registers the Interface Repository object with the SOM Class Manager.
long **somSubstituteClass** (in string origClassName, in string newClassName);	Causes the somFindClass, somFindClsInFile, and somClassFromId methods to substitute one class for another.
long **somUnloadClassFile** (in SOMClass class);	Unloads a dynamically loaded class and frees the class's object.
long **somUnregisterClass** (in SOMClass class);	Removes a class object from the SOM run-time class registry.

SOMObject class

(see somobj.idl)
Note: Method prototypes for the SOM kernel classes are expressed using IDL syntax for OIDL callstyle methods. That is, the receiver of the method is implicit, and the two possible CORBA implicit arguments (environment and context) are not passed.

boolean **somDispatch** (out somToken retValue, in somId methodId, va_list args);	Invokes the indicated method on the receiver. For static methods, resolution of the indicated method is performed using the method table of the receiver's class. The result returned by the method is stored into the location pointed to by retValue. The va_list must include the target object as well as the arguments.
boolean **somClassDispatch** (in SOMClass clsObj, out somToken retValue, in somId methodId, va_list args);	Like somDispatch, except that static method resolution is performed using the instance method table of the specified class (clsObj).
somToken **somDispatchA** (in somId methodId, in somId descriptor, in va_list args);	Obsolete. Like somDispatch, but restricted to methods that return a pointer. The va_list must not include the target object. This method has been superseded by somDispatch and is included solely for backward compatibility.
double **somDispatchD** (in somId methodId, in somId descriptor, in va_list args);	Obsolete. As above, but restricted to methods that return a double precision floating point.
long **somDispatchL** (in somId methodId, in somId descriptor, in va_list args);	Obsolete. As above, but restricted to methods that return a long.
void **somDispatchV** (in somId methodId, in somId descriptor, in va_list args);	Obsolete. As above, but restricted to methods that return void.
void **somDumpSelf** (in long level);	Clients of an object use this method to write out a detailed description of the object.
void **somDumpSelfInt** (in long level);	Implementors of a class override this method to support somDumpSelf.
void **somFree** ();	Releases the storage used by an object and frees the object.
SOMClass **somGetClass** ();	Returns a pointer to an object's class object.
string **somGetClassName** ();	Returns the name of the class of an object.
long **somGetSize** ();	Returns the size of an object.
void **somInit** ();	Implementors of a class may override this method to initialize instance variables or attributes introduced by the class.

boolean **somIsA** (in SOMClass aClass);	Tests whether the receiving object is an instance of the indicated class or of one of its subclasses.
boolean **somIsInstanceOf(** in SOMClass aClass);	Tests whether the receiving object is an instance of the indicated class.
SOMObject **somPrintSelf** ();	Implementors of a class may override this method to writes a detailed description of the receiving object. A pointer to the receiving object is returned as the result of the method call.
boolean **somRespondsTo** (in somId methodId);	Tests whether an object can respond to an invocation of the indicated method.
void **somUninit** ();	Un-initializes the receiving object. Implementors of a class may override this method to free any allocated memory pointed to by instance data or attributes introduced by the class.

DSOM Framework Quick Reference

Class Organization

SOMObject

- **BOA** – *Basic Object Adapter.* Abstract class which defines basic interfaces that a server process uses to access services of an Object Request Broker like DSOM. Defines methods for creating and exporting object references, registering and activating implementations, and authenticating requests.
  - **SOMOA** – *SOM Object Adapter.* Subclass of BOA. Implements BOA methods, and introduces methods for receiving and dispatching requests.
- **Context** – *Context.* List of properties (Environment variables) that can be passed in a method invocation. Each property consists of a name and a string value.
- **ImplementationDef** – *Implementation Definition.* Attributes define the implementation of a server.
- **ImplRepository** – *Implementation Repository.* Defines and implements methods used to query and update the DSOM implementation repository, which stores copies of the ImplementationDef objects.
- **NVList** – *Named Value List.* Implements a list of <name,value> pairs. NVLists are used in building Request objects and Context objects.
- **ObjectMgr** – *Object Manager.* Abstract class which defines basic interfaces for creating objects, destroying objects, and mapping between objects and their ids.
  - **SOMDObjectMgr** – *DSOM Object Manager.* Provides a DSOM-specific implementations of the ObjectMgr abstract class. Also, introduces methods for finding DSOM server implementations, by id, alias, and class.
- **ORB** – *Object Request Broker.* Defines and implements various utility methods as defined in the CORBA 1.1 specification. Included are methods for converting object references to and from strings, for creating NVLists to be used in building specific Requests, and for obtaining a default Context object.
- **Principal** – *Principal.* Attributes contain the ids of the user and host from which a request originated. Used by application for access control checking.
- **Request** – *Request.* Represents a method call and parameters, in the Dynamic Invocation Interface. Includes methods used to invoke the request, either synchronously (waits for a response) or asynchronously.
- **SOMDServer** – *DSOM Server.* Base class which defines and implements methods for managing objects in a server. Includes methods for object creation and deletion, and mapping between SOM objects and object references. Also supports intercepting and redispatching method calls.
- **SOMDObject** – *DSOM Object.* Implements an "object reference" in DSOM. Includes methods for getting an implementation or interface from a reference, testing whether it is nil, and duplicating or releasing the reference.
  - **SOMDClientProxy** – *DSOM Client Proxy.* Subclass of SOMDObject. This "mixin" class is used to implement proxy objects in client processes. Provides the remote dispatching function used to forward requests to target objects. Also supports the construction of dynamic requests to be invoked against the proxy object.

DSOM functions

(see request.h)

ORBStatus **get_next_response** (Environment* env, Flags response_flags, Request * req);	Returns the next Request object to complete, after starting multiple requests in parallel.
ORBStatus **send_multiple_requests** (Request reqs[ ], Environment* env, long count, Flags invoke_flags);	Initiates multiple Requests in parallel.

(see somdext.h)

void **ORBfree** (void* ptr);	Frees memory allocated by DSOM for return values and output arguments.
void **SOMD_Init** (Environment* env);	Initializes DSOM in the calling process.
void **SOMD_Uninit** (Environment* env);	Free system resources allocated for use by DSOM.
void **SOMD_RegisterCallback** (SOMEEMan emanObj**,** EMRegProc *func);	Registers a callback function for handling DSOM request events.

BOA class

(see boa.idl)

void **change_implementation** (in SOMDObject obj, in ImplementationDef impl);	Changes the implementation definition associated with the referenced object. *(Not implemented.)*
SOMDObject **create** (in ReferenceData id, in InterfaceDef intf, in ImplementationDef impl);	Creates a “reference” for a local application object which can be exported to remote clients.
void **deactivate_impl** (in ImplementationDef impl);	Indicates that a server implementation is no longer ready to process requests.
void **deactivate_obj** (in SOMDObject obj);	Indicates that an object server is no longer ready to process requests. *(Not implemented.)*
void **dispose** (in SOMDObject obj);	Destroys an object reference.
ReferenceData **get_id** (in SOMDObject obj);	Returns reference data associated with the referenced object.
Principal **get_principal** (in SOMDObject obj, in Environment* req_ev);	Returns the ID of the principal that issued the request.
void **impl_is_ready** (in ImplementationDef impl);	Indicates that the server implementation is ready to process requests.
void **obj_is_ready** (in SOMDObject obj, in ImplementationDef impl);	Indicates that the object (server) is ready to process requests. *(Not implemented.)*

void **set_exception** (
in exception_type major,
in string except_name,
in void *param);

Returns an exception to a client.

Context class

(see cntxt.idl)

ORBStatus **create_child** (
in Identifier ctx_name,
out Context child_ctx);

Creates a child of a Context object.

ORBStatus **delete_values** (
in Identifier prop_name);

Deletes property value(s).

ORBStatus **destroy** (
in Flags del_flag);

Deletes a Context object.

ORBStatus **get_values** (
in Identifier start_scope,
in Flags op_flags,
in Identifier prop_name,
out NVList values);

Retrieves the specified property values.

ORBStatus **set_one_value** (
in Identifier prop_name,
in string value);

Adds a single property to the specified Context object.

ORBStatus **set_values** (
in NVList values);

Adds/changes one or more property values in the specified Context object.

ImplementationDef class

(see impldef.idl)

attribute string **impl_id**;

Contains the DSOM-generated identifier for a server implementation.

attribute string **impl_alias**;

Contains the “alias” (user-friendly name) for a server implementation.

attribute string **impl_program**;

Contains the full pathname of the program which will be executed by the process for this server.

attribute Flags **impl_flags**;

Contains a bit-vector of flags used to identify server options (e.g., multi-threading).

attribute string **impl_server_class**;

Contains the name of the SOMDServer class or subclass created by the server process.

attribute string **impl_refdata_file**;

Contains the full pathname of the file used to store ReferenceData for the server.

attribute string **impl_refdata_bkup**;

Contains the full pathname of the backup mirror file used to store ReferenceData for the server.

attribute string **impl_hostname**;

Contains the hostname of the machine where the server is located.

ImplRepository class

(see implrep.idl)

void **add_class_to_impldef** (in ImplId implid, in string classname);	Associates a class with a server.
void **add_impldef** (in ImplementationDef impldef);	Adds an implementation definition to the Implementation Repository.
void **delete_impldef** (in ImplId implid);	Deletes an implementation definition from the Implementation Repository.
sequence<string> **find_classes_by_impldef** (in ImplId implid);	Returns a sequence of class names associated with a server.
ImplementationDef **find_impldef** (in ImplId implid);	Returns a server implementation definition given its id.
ImplementationDef **find_impldef_by_alias** (in string alias_name);	Returns a server implementation definition given its user-friendly alias.
sequence<ImplementationDef> **find_impldef_by_class** (in string classname);	Returns a sequence of implementation definitions for servers that are associated with a specified class.
void **remove_class_from_impldef** (in ImplId implid, in string classname);	Removes the association of a particular class with a server.
void **update_impldef** (in ImplementationDef impldef);	Updates an implementation definition in the Implementation Repository.

NVList class

(see nvlist.idl)

ORBStatus **add_item** (in Identifier item_name, in TypeCode item_type, in void *value, in long value_len, in Flags item_flags);	Adds an item to the specified NVList.
ORBStatus **free** ( );	Frees a specified list structure.
ORBStatus **free_memory** ( );	Frees any dynamically allocated out-arg memory associated with the specified list.
ORBStatus **get_count** (out long count);	Returns the total number of items allocated for a list.
long **get_item** (in long item_number, out Identifier item_name, out TypeCode item_type, out void *value, out long value_len, out Flags item_flags);	Returns the contents of a specified list item.

long **set_item** (
in long item_number,
in Identifier item_name,
in TypeCode item_type,
in void *value,
in long value_len,
in Flags item_flags);

Sets the contents of an item in an NVList.

ObjectMgr class

(see om.idl)

void **somdDestroyObject** (
in SOMObject obj);

Request to destroy the target object.

string **somdGetIdFromObject** (
in SOMObject obj);

Returns the persistent ID for an object managed by a specified Object Manager.

SOMObject **somdGetObjectFromId** (
in string id);

Finds and activates an object implemented by a specified object manager, given its ID.

SOMObject **somdNewObject** (
in Identifier objclass,
in string hints);

Returns a new object of the named type and implementation.

void **somdReleaseObject** (
in SOMObject obj);

Indicates that the client has finished using the object.

ORB class

(see orb.idl)

ORBStatus **create_list** (
in long count,
out NVList new_list);

Creates an NVList of the specified size.

ORBStatus **create_operation_list** (
in OperationDef operation,
out NVList new_list);

Creates an NVList initialized with the argument descriptions for a given operation.

ORBStatus **get_default_context** (
out Context ctx) ;

Returns the default process Context object.

string **object_to_string** (
in SOMDObject obj);

Converts an object reference to an external form (string) which can be stored or transmitted.

SOMDObject **string_to_object** (
in string str);

Converts an externalized (string) form of an object reference into an active object reference.

Principal class

(see principl.idl)

attribute string **userName**;

Identifies the name of the user associated with the request invocation.
(Currently, this value is obtained from the USER environment variable in the process which invoked the request.)

attribute string **hostName**;

Identifies the name of the host from where the request originated.
(Currently, this value is obtained from the HOSTNAME environment variable in the process which invoked the request.)

Request class

(see request.idl)

ORBStatus **add_arg** (in Identifier name, in TypeCode arg_type, in void *value, in long len, in Flags arg_flags);	Incrementally adds an argument to a Request object.
ORBStatus **destroy** ( );	Deletes the memory allocated by DSOM for a Request object.
ORBStatus **get_response** (in Flags response_flags);	Determines whether an asynchronous Request has completed.
ORBStatus **invoke** (in Flags invoke_flags);	Invokes a Request synchronously, waiting for the response.
ORBStatus **send** (in Flags invoke_flags);	Invokes a Request asynchronously.

SOMDClientProxy class

(see somdcprx.idl)

void **somdProxyFree** ( );	Executes somFree on the local proxy object.
SOMClass **somdProxyGetClass** ( );	Returns the class object for the local proxy object.
string **somdProxyGetClassName** ( );	Returns the class name for the local proxy object.
void **somdTargetFree** ( );	Forwards the somFree method call to the remote target object.
SOMClass **somdTargetGetClass** ( );	Returns (a proxy for) the class object for the remote target object.
string **somdTargetGetClassName** ( );	Returns the class name for the remote target object.

SOMDObject class

(see somdobj.idl)

ORBStatus **create_request** (in Context ctx, in Identifier operation, in NVList arg_list, inout NamedValue result, out Request request, in Flags req_flags);	Creates a request to execute a particular operation (method) on the referenced object.
ORBStatus **create_request_args** (in Identifier operation, out NVList arg_list, out NamedValue result);	Creates an argument list appropriate for the specified operation (method).
SOMDObject **duplicate** ( );	Makes a duplicate of an object reference.
ImplementationDef **get_implementation** ( );	Returns the implementation definition for the referenced object.
InterfaceDef **get_interface** ( );	Returns the interface definition object for the referenced object.

boolean **is_constant** ( );	Tests to see if the object reference is a constant (i.e., its ReferenceData is a constant value associated with the reference).
boolean **is_nil** ( );	Tests to see if the object reference is nil.
boolean **is_SOM_ref** ( );	Tests to see if the object reference is a simple reference to a SOM object.
boolean **is_proxy**( );	Tests to see if the object reference is a proxy.
void **release** ( );	Releases the memory associated with the specified object reference.

SOMDObjectMgr class

(see somdom.idl)

SOMDServer **somdFindAnyServerByClass** (in Identifier objclass);	Finds a server capable of creating the specified object.
SOMDServer **somdFindServer** (in ImplId serverid);	Finds a server given its ImplementationDef id.
sequence<SOMDServer> **somdFindServersByClass** (in Identifier objclass);	Finds all servers capable of creating a particular object.
SOMDServer **somdFindServerByName** (in string servername);	Finds a server given its ImplementationDef id.

SOMDServer class

(see somdserv.idl)

SOMObject **somdCreateObj** (in Identifier objclass, in string hint);	Creates an object of the specified class.
void **somdDeleteObj** (in SOMObject somobj);	Deletes the specified object.
void **somdDispatchMethod** (in SOMObject somobj, out somToken retValue, in somId methodId, in va_list ap);	Dispatch a method on the specified SOM object.
SOMClass **somdGetClassObj** (in Identifier objclass);	Creates a class object for the specified class.
SOMDObject **somdRefFromSOMObj** (in SOMObject somobj);	Returns an object reference corresponding to the specified SOM object.
SOMObject **somdSOMObjFromRef** (in SOMDObject objref);	Returns the SOM object corresponding to the specified object reference.

SOMOA class

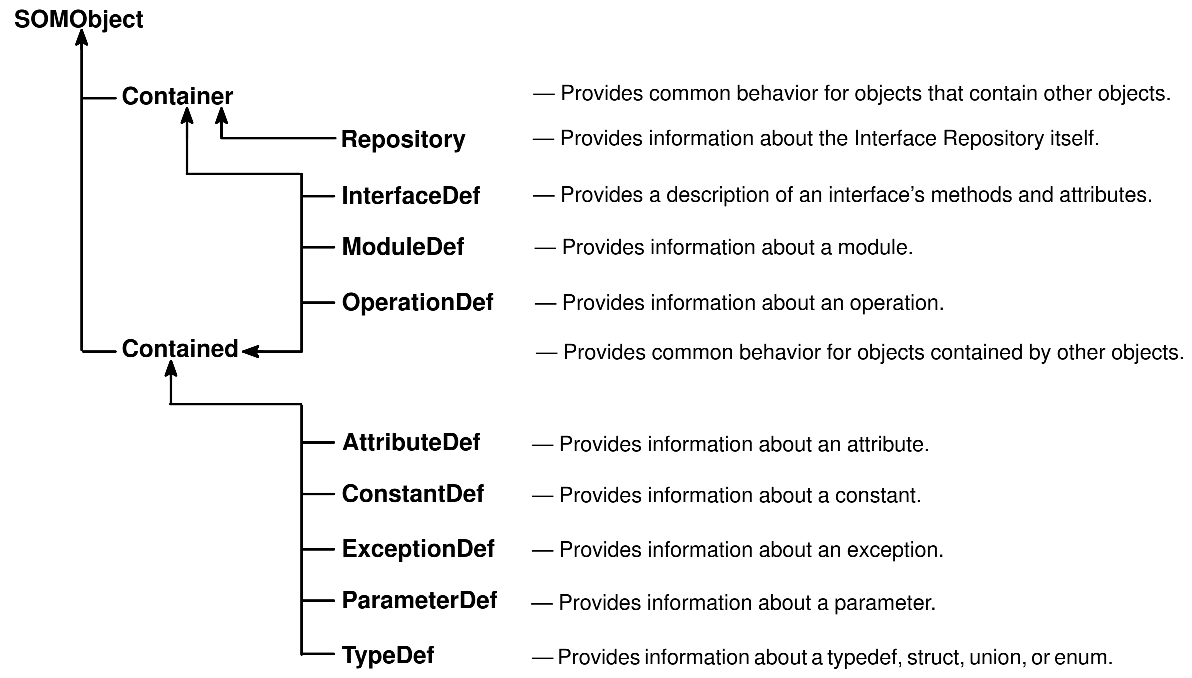
(see somoa.idl)

void **activate_impl_failed** (in ImplementationDef implDef, in long rc);	Sends a message to the DSOM daemon indicating that the server process did not activate.

void **change_id** (in SOMDObject objref, in ReferenceData id);	Changes the reference data associated with an object.
SOMDObject **create_constant** (in ReferenceData id, in InterfaceDef intf, in ImplementationDef impl);	Creates a “constant” object reference.
SOMDObject **create_SOM_ref** (in SOMObject somobj, in ImplementationDef impl);	Creates a simple, transient DSOM reference to a SOM object.
ORBStatus **execute_next_request** (in Flags waitFlag);	Receive a request message, execute the request, and return the result to the caller.
ORBStatus **execute_request_loop** (in Flags waitFlag);	Continuously receives request messages, executing them and returning results.
SOMObject **get_SOM_object** (in SOMDObject somref);	Get the SOM object associated with a simple, transient DSOM reference.

Interface Repository Framework Quick Reference

Class Organization



Contained class
(see containd.idl)

Description **describe** ( );	Returns a structure containing all of the information defined in the IDL specification that corresponds to a specified Contained object in the Interface Repository.
sequence(Container) **within** ( );	Returns a list of objects (in the Interface Repository) that contain a specified Contained object.

Container class
(see containr.idl)

sequence(Contained) **contents** (in InterfaceName limit_type, in boolean exclude_inherited);	Returns a sequence indicating the objects contained within a specified Container object of the Interface Repository.
sequence(ContainerDescription) **describe_contents** (in InterfaceName limit_type, in boolean exclude_inherited, in long max_returned_objs);	Returns a sequence of descriptions of the objects contained within a specified Container object of the Interface Repository.

sequence(Contained) **lookup_name** (in Identifier search_name, in long levels_to_search, in InterfaceName limit_type, in boolean exclude_inherited);	Locates an object by name within a specified Container object of the Interface Repository, or within objects contained in the Container object.

InterfaceDef class

(see intfacdf.idl)

FullInterfaceDescription **describe_interface** ( );	Returns (from the Interface Repository) a description of all the methods and attributes of an interface definition.

Repository class

(see repostry.idl)

Contained **lookup_id** (in RepositoryId search_id);	Returns the object having a specified RepositoryId.
string **lookup_modifier** (in RepositoryId id, in string modifier);	Returns the value of a given SOM modifier for a specified object [that is, for an object that is a component of an IDL interface (class) definition maintained within the Interface Repository].
void **release_cache** ( );	Releases implicitly referenced objects in the internal Interface Repository cache.

Functions

(see somtc.h)

short **TypeCode_alignment** ( );	Returns the alignment value from a given TypeCode.
TypeCode **TypeCode_copy** ( );	Creates a new copy of a given TypeCode.
boolean **TypeCode_equal** (TypeCode tc2);	Compares two TypeCodes for equality.
void **TypeCode_free** ( );	Destroys a given TypeCode by freeing all of the memory used to represent it.
TCKind **TypeCode_kind** ( );	Categorizes the abstract data type described by a TypeCode.

```
enum  TCKind {
        tk_null,  tk_void,
        tk_short,  tk_long,
        tk_ushort, tk_ulong,
        tk_float,  tk_double,
        tk_boolean,  tk_char,
        tk_octet,  tk_any,
        tk_TypeCode,  tk_Principal,
        tk_objref,  tk_struct,
        tk_union,  tk_enum,
        tk_string, tk_sequence,
        tk_array,  tk_pointer,
        tk_self, tk_foreign
        };
```

TypeCode **TypeCodeNew** (TCKind tag, ...); † — Creates a new TypeCode instance.

† Takes *no* implicit parameters.
TypeCodeNew (tk_objref, string interfaceId);
TypeCodeNew (tk_string, long maxLength);
TypeCodeNew (tk_sequence, TypeCode seqTC, long maxLength);
TypeCodeNew (tk_array, TypeCode arrayTC, long length);
TypeCodeNew (tk_pointer, TypeCode ptrTC);
TypeCodeNew (tk_self, string structOrUnionName);
TypeCodeNew (tk_foreign, string typename, string impCtx, long instSize);

TypeCodeNew (tk_struct,
string name,
string mbrName,
TypeCode mbrTC, [...,]
[mbrName and mbrTC repeat as needed]
NULL);

TypeCodeNew (tk_union,
string name,
TypeCode swTC,
long flag,
long labelValue,
string mbrName,
TypeCode mbrTC, [...,]
[flag, labelValue, mbrName and mbrTC repeat as needed]
NULL);

TypeCodeNew (tk_enum,
string name,
string enumId, [...,]
[enumIds repeat as needed]
NULL);

TypeCodeNew (TCKind allOtherTagValues);

'allOtherTagValues' represents one of the values:
tk_null, tk_void, tk_short, tk_long,
tk_ushort, tk_ulong, tk_float, tk_double,
tk_boolean, tk_char, tk_octet,
tk_any, tk_TypeCode, or Tk_Principal
All of these tags represent basic IDL data types that do not require any other descriptive parameters.

long **TypeCode_param_count** ( ); — Obtains the number of parameters available in a given TypeCode.

any **TypeCode_parameter** (long index); — Obtains a specified parameter from a given TypeCode.

void **TypeCode_print** ( ); — Writes all of the information contained in a given TypeCode to "stdout".

void **TypeCode_setAlignment** (short alignment); — Overrides the default alignment associated with the given TypeCode.

long **TypeCode_size** ( ); — Provides the minimum size of an instance of the abstract data type described by a given TypeCode.

Utility Metaclasses Quick Reference

Class Organization

SOMObject

↑

SOMClass
metaclass — The root class of all SOM metaclasses. Defines the essential behavior (methods) common to all SOM classes.

↑

← **SOMMSingleInstance**
metaclass — Serves as the metaclass when defining a class for which only one instance can ever be created.

SOMMSingleInstance class

(see snglicls.idl)

SOMObject **sommGetSingleInstance** ( );	Gets the one instance of a specified class for which only a single instance can exist.

Event Management Framework Quick Reference

Class Organization

SOMObject

- **SOMEEman** — Handles input events. EMan performs a blocked (or timed) wait on all registered event sources concurrently.
- **SOMEEMRegisterData** — Holds registration information for event types to be registered with the SOMEEman class.
- **SOMEEvent** — Timestamps an event before it is passed to a callback routine. This is the base class for all generic events within the Event Manager.
  - **SOMEClientEvent** — Describes generic client events within EMan. Client events are defined created, processed, and destroyed entirely by the application.
  - **SOMESinkEvent** — Describes a sink event generated by EMan when activity occurs on a registered sink. EMan passes an instance of SOMESinkEvent to the callback registered for sink events, so the callback can query it.
  - **SOMETimerEvent** — Describes a timer event generated by EMan when a registered timer pops. EMan passes an instance of SOMETimerEvent to the callback registered for timer events, so the callback can query it.
  - **SOMEWorkProcEvent** — Describes a work procedure event object generated by EMan when a work procedure is registered and there are no other events to process in EMan. EMan passes an instance of SOMEWorkProcEvent to the callbacks of each registered Work Procedure.

SOMEClientEvent class
(see clientev.idl)

void* **somevGetEventClientData** ( );	Returns the user-defined data associated with a client event.
string **somevGetEventClientType** ( );	Returns the type name of a client event.
void **somevSetEventClientData** (in void* clientData);	Sets the user-defined data of a client event.
void **somevSetEventClientType** (in string clientType);	Sets the type name of a client event.

SOMEEMan class
(see eman.idl)

void **someChangeRegData** (in long registrationId, in SOMEEMRegisterData registerData);	Changes the registration data associated with a specified registration ID.

void **someGetEManSem** ( );	Acquires EMan semaphore(s) to achieve mutual exclusion with EMan's activity.
void **someProcessEvent** (in unsigned long mask);	Processes one event.
void **someProcessEvents** ( );	Processes infinite events.
void **someQueueEvent** (in SOMEClientEvent event);	Enqueues the specified client event.
long **someRegister** (in SOMEEMRegisterData registerData, in SOMObject targetObject, in string targetMethod, in void *targetData);	Registers an object/method pair with EMan, given a specified registerData object.
long **someRegisterEv** (in SOMEEMRegisterData registerData, in SOMObject targetObject, inout Environment callbackEv, in string targetMethod, in void *targetData);	Registers the (object, method, Environment parameter) combination of a callback with EMan, given a specified registerData object.
long **someRegisterProc** (in SOMEEMRegisterData registerData, in EMRegProc *targetProcedure, in void *targetData);	Register the procedure with EMan given the specified registerData.
void **someReleaseEManSem** ( );	Releases the semaphore obtained by the someGetEManSem method.
void **someShutdown** ( );	Shuts down an EMan event loop. (That is, this makes the someProcessEvents return!)
void **someUnRegister** (in long registrationId);	Unregisters the event interest associated with a specified registrationId within EMan.

SOMEEMRegisterData class

(see emregdat.idl)

void **someClearRegData** ( );	Clears the registration data.
void **someSetRegDataClientType** (in string clientType);	Sets the type name for a client event.
void **someSetRegDataEventMask** (in long eventType, in va_list ap);	Sets the generic event mask within the registration data using NULL terminated event type list.
void **someSetRegDataSink** (in long sink);	Sets the file descriptor (or socket ID, or message queue ID) for the sink event.
void **someSetRegDataSinkMask** (in unsigned long sinkmask);	Sets the sink mask within the registration data object.
void **someSetRegDataTimerCount** (in long count);	Sets the number of times the timer will trigger, within the registration data.
void **someSetRegDataTimerInterval** (in long interval);	Sets the timer interval within the registration data.

SOMEEvent class
(see event.idl)

unsigned long **somevGetEventTime** ( );	Returns the time of the generic event in milliseconds.
unsigned long **somevGetEventType** ( );	Returns the type of the generic event.
void **somevSetEventTime** (in unsigned long time);	Sets the time of the generic event (time is in milliseconds).
void **somevSetEventType** (in unsigned long type);	Sets the type of the generic event.

SOMESinkEvent class
(see sinkev.idl)

long **somevGetEventSink** ( );	Returns the sink, or source of I/O, of the generic sink event.
void **somevSetEventSink** (in long sink);	Sets the sink, or source of I/O, of the generic sink event.

SOMETimerEvent class
(see timerev.idl)

void **somevGetEventInterval** ( );	Returns the interval of the generic timer event (time in milliseconds).
void **somevSetEventInterval** (in long interval);	Sets the interval of the generic timer event (in milliseconds).

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