Hosting Environment (Daemon)

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Data Structures

- class Broker
- class BrokerLoader
- class BrokerPluginArgument
- class ClientInterface

  Utility base class for MCC.
- class ClientTCP

  Class for setting up a MCC chain for TCP communication.
- struct HTTPClientInfo
- class ClientHTTP

  Class for setting up a MCC chain for HTTP communication.
- class ClientSOAP
- class SecHandlerConfig
- class DNListHandlerConfig
- class ARCPolicyHandlerConfig
- class ClientHTTPwithSAML2SSO
- class ClientSOAPwithSAML2SSO
- class ClientX509Delegation
- class ConfusaCertHandler
- class ConfusaParserUtils
- class HakaClient
- class OpenIdpClient
- class OAuthConsumer
- class SAML2LoginClient
- class SAML2SSOHTTPClient
- class Endpoint
- class ServiceEndpoint

- class RegistryEndpoint
- class ComputingInfoEndpoint
- class EndpointQueryingStatus
- class EndpointQueryOptions
- class EndpointQueryOptions< ServiceEndpoint >
- class EndpointRetrieverPlugin
- class EndpointRetrieverPluginLoader
- class EndpointConsumer
- class EndpointContainer
- class EndpointRetriever
- class ExecutionTargetRetriever
- class ApplicationEnvironment

  ApplicationEnvironment.
- class ComputingEndpointType
- class ExecutionTarget

  ExecutionTarget.
- class GLUE2

  GLUE2 parser.
- class Job

  Job.
- class JobController

  Base class for the JobControllers.
- class JobControllerLoader
- class JobControllerPluginArgument
- class OptIn
- class Range
- class ScalableTime
- class ScalableTime< int >
- class JobIdentificationType

  Job identification.
- class ExecutableType

  Executable.
- class RemoteLoggingType

  Remote logging.
- class NotificationType
- class ApplicationType
- class SlotRequirementType
- class DiskSpaceRequirementType
- class ParallelEnvironmentType
- class ResourcesType
- class SourceType
- class TargetType
- class InputFileType
- class OutputFileType
- class DataStagingType

- class JobDescriptionResult
- class JobDescription
- class JobDescriptionParserResult
- class JobDescriptionParser

  Abstract class for the different parsers.
- class JobDescriptionParserLoader
- class JobState
- class JobSupervisor

  % JobSupervisor class
- class Software

  Used to represent software (names and version) and comparison.
- class SoftwareRequirement

  Class used to express and resolve version requirements on software.
- class Submitter

  Base class for the Submitters.
- class SubmitterLoader
- class SubmitterPluginArgument
- class TargetGenerator

  Target generation class
- class TargetRetriever

  TargetRetriever base class
- class TargetRetrieverLoader
- class TargetRetrieverPluginArgument
- class BrokerTestACCControl
- class JobDescriptionParserTestACCControl
- class JobControllerTestACCControl
- class SubmitterTestACCControl
- class TargetRetrieverTestACCControl
- class JobStateTEST
- class JobListRetrieverPluginTESTControl
- class ServiceEndpointRetrieverPluginTESTControl
- class TargetInformationRetrieverPluginTESTControl
- class Config

  Configuration element - represents (sub)tree of ARC configuration.
- class BaseConfig
- class ArcLocation

  Determines ARC installation location.
- class RegularExpression

  A regular expression class.
- class ArcVersion

  Determines ARC HED libraries version.
- class Base64
- class CheckSum

  Interface for checksum manipulations.

- class CRC32Sum

  Implementation of CRC32 checksum.
- class MD5Sum

  Implementation of MD5 checksum.
- class Adler32Sum

  Implementation of Adler32 checksum.
- class CheckSumAny

  Wrapper for CheckSum class.
- class Counter

  A class defining a common interface for counters.
- class CounterTicket

  A class for "tickets" that correspond to counter reservations.
- class ExpirationReminder

  A class intended for internal use within counters.
- class Period
- class Time

  A class for storing and manipulating times.
- class Database

  Interface for calling database client library.
- class Query
- class FileAccess

  Defines interface for accessing filesystems.
- class FileLock

  A general file locking class.
- class IniConfig
- class IntraProcessCounter

  A class for counters used by threads within a single process.
- class PrintFBase
- class PrintF
- class IString
- struct LoggerFormat
- class LogMessage

  A class for log messages.
- class LogDestination

  A base class for log destinations.
- class LogStream

  A class for logging to ostreams.
- class LogFile

  A class for logging to files.
- class LoggerContext

  Container for logger configuration.
- class Logger

  A logger class.
- class MySQLDatabase

- class MySQLQuery
- class OptionParser
- class Profile
- class Run
- class ThreadDataItem

  Base class for per-thread object.
- class SimpleCondition

  Simple triggered condition.
- class SimpleCounter
- class TimedMutex
- class SharedMutex
- class ThreadedPointerBase

  Helper class for ThreadedPointer.
- class ThreadedPointer

  Wrapper for pointer with automatic destruction and mutiple references.
- class ThreadRegistry
- class ThreadInitializer
- class URL

  Class to hold general URLs.
- class URLLocation

  Class to hold a resolved URL location.
- class PathIterator

  Class to iterate through elements of path.
- class User
- class UserSwitch
- class ConfigEndpoint
- class initializeCredentialsType

  Defines how user credentials are looked for.
- class UserConfig

  User configuration class
- class CertEnvLocker
- class EnvLockWrapper
- class AutoPointer

  Wrapper for pointer with automatic destruction.
- class CountedPointer

  Wrapper for pointer with automatic destruction and mutiple references.
- class NS
- class XMLNode

  Wrapper for LibXML library Tree interface.
- class XMLNodeContainer
- class CredentialError
- class Credential
- class VOMSACInfo
- class VOMSTrustList

- class CredentialStore
- class XmlContainer
- class XmlDatabase
- class DelegationConsumer
- class DelegationProvider
- class DelegationConsumerSOAP
- class DelegationProviderSOAP
- class DelegationContainerSOAP
- class GlobusResult
- class GSSCredential
- class InfoCache

  Stores XML document in filesystem split into parts.
- class InfoCacheInterface
- class InfoFilter

  Filters information document according to identity of requestor.
- class InfoRegister

  Registration to ISIS interface.
- class InfoRegisters

  Handling multiple registrations to ISISes.
- struct Register_Info_Type
- struct ISIS_description
- class InfoRegistrar

  Registration process associated with particular ISIS.
- class InfoRegisterContainer
- class InformationInterface

  Information System message processor.
- class InformationContainer

  Information System document container and processor.
- class InformationRequest

  Request for information in InfoSystem.
- class InformationResponse

  Informational response from InfoSystem.
- class RegisteredService

  RegisteredService - extension of Service performing self-registration.
- class FinderLoader
- class Loader

  Plugins loader.
- class LoadableModuleDesciption
- class ModuleManager

  Manager of shared libraries.
- class Plugin

  Base class for loadable ARC components.
- class PluginArgument

  Base class for passing arguments to loadable ARC components.

- struct PluginDescriptor

  Description of ARC lodable component.
- class PluginDesc

  Description of plugin.
- class ModuleDesc

  Description of loadable module.
- class PluginsFactory

  Generic ARC plugins loader.
- class MCCInterface

  Interface for communication between MCC, Service and Plexer objects.
- class MCC

  Message Chain Component - base class for every MCC plugin.
- class MCCConfig
- class MCCPluginArgument
- class MCC_Status

  A class for communication of MCC processing results.
- class MCCLoader

  Creator of Message Component Chains (MCC).
- class ChainContext

  Interface to chain specific functionality.
- class MessagePayload

  Base class for content of message passed through chain.
- class MessageContextElement

  Top class for elements contained in message context.
- class MessageContext

  Handler for content of message context.
- class MessageAuthContext

  Handler for content of message auth∗ context.
- class Message

  Object being passed through chain of MCCs.
- class AttributeIterator

  A const iterator class for accessing multiple values of an attribute.
- class MessageAttributes

  A class for storage of attribute values.
- class MessageAuth

  Contains authencity information, authorization tokens and decisions.
- class PayloadRawInterface

  Random Access Payload for Message objects.
- struct PayloadRawBuf
- class PayloadRaw

  Raw byte multi-buffer.
- class PayloadSOAP

  Payload of Message with SOAP content.

- class PayloadStreamInterface

  Stream-like Payload for Message object.
- class PayloadStream

  POSIX handle as Payload.
- class PlexerEntry

  A pair of label (regex) and pointer to MCC.
- class Plexer

  The Plexer class, used for routing messages to services.
- class CIStringValue

  This class implements case insensitive strings as security attributes.
- class SecAttrValue

  This is an abstract interface to a security attribute.
- class SecAttrFormat

  Export/import format.
- class SecAttr

  This is an abstract interface to a security attribute.
- class MultiSecAttr

  Container of multiple SecAttr attributes.
- class Service

  Service - last component in a Message Chain.
- class ServicePluginArgument
- class SOAPMessage

  Message restricted to SOAP payload.
- class ClassLoader
- class ClassLoaderPluginArgument
- class WSAEndpointReference

  Interface for manipulation of WS-Adressing Endpoint Reference.
- class WSAHeader

  Interface for manipulation WS-Addressing information in SOAP header.
- class SAMLToken

  Class for manipulating SAML Token Profile.
- class UsernameToken

  Interface for manipulation of WS-Security according to Username Token Profile.
- class X509Token

  Class for manipulating X.509 Token Profile.
- class PayloadWSRF

  This class combines MessagePayload with WSRF.
- class WSRP

  Base class for WS-ResourceProperties structures.
- class WSRPFault

  Base class for WS-ResourceProperties faults.
- class WSRPInvalidResourcePropertyQNameFault
- class WSRPResourcePropertyChangeFailure

- class WSRPUnableToPutResourcePropertyDocumentFault
- class WSRPInvalidModificationFault
- class WSRPUnableToModifyResourcePropertyFault
- class WSRPSetResourcePropertyRequestFailedFault
- class WSRPInsertResourcePropertiesRequestFailedFault
- class WSRPUpdateResourcePropertiesRequestFailedFault
- class WSRPDeleteResourcePropertiesRequestFailedFault
- class WSRPGetResourcePropertyDocumentRequest
- class WSRPGetResourcePropertyDocumentResponse
- class WSRPGetResourcePropertyRequest
- class WSRPGetResourcePropertyResponse
- class WSRPGetMultipleResourcePropertiesRequest
- class WSRPGetMultipleResourcePropertiesResponse
- class WSRPPutResourcePropertyDocumentRequest
- class WSRPPutResourcePropertyDocumentResponse
- class WSRPModifyResourceProperties
- class WSRPInsertResourceProperties
- class WSRPUpdateResourceProperties
- class WSRPDeleteResourceProperties
- class WSRPSetResourcePropertiesRequest
- class WSRPSetResourcePropertiesResponse
- class WSRPInsertResourcePropertiesRequest
- class WSRPInsertResourcePropertiesResponse
- class WSRPUpdateResourcePropertiesRequest
- class WSRPUpdateResourcePropertiesResponse
- class WSRPDeleteResourcePropertiesRequest
- class WSRPDeleteResourcePropertiesResponse
- class WSRPQueryResourcePropertiesRequest
- class WSRPQueryResourcePropertiesResponse
- class WSRF

  Base class for every WSRF message.
- class WSRFBaseFault

  Base class for WSRF fault messages.
- class WSRFResourceUnknownFault
- class WSRFResourceUnavailableFault
- class XMLSecNode

  Extends XMLNode class to support XML security operation.

Typedefs

- typedef Plugin $*$($*$ get_plugin_instance)(PluginArgument $*$arg)
- typedef std::multimap $<$ std::string, std::string $>$ AttrMap
- typedef AttrMap::const_iterator AttrConstIter
- typedef AttrMap::iterator AttrIter

Enumerations

- enum TimeFormat
- enum LogLevel
- enum LogFormat
- enum escape_type { , escape_octal, escape_hex }
- enum StatusKind { , STATUS_OK = 1, GENERIC_ERROR = 2, PARSING_ERROR = 4, PROTOCOL_RECOGNIZED_ERROR = 8, UNKNOWN_SERVICE_-ERROR = 16, BUSY_ERROR = 32, SESSION_CLOSE = 64 }
- enum WSAFault { , WSAFaultUnknown, WSAFaultInvalidAddressingHeader }

Functions

- std::ostream & operator<< (std::ostream &, const Period &)
- std::ostream & operator<< (std::ostream &, const Time &)
- std::string TimeStamp (const TimeFormat &=Time::GetFormat())
- std::string TimeStamp (Time, const TimeFormat &=Time::GetFormat())
- bool FileCopy (const std::string &source_path, const std::string &destination_-path, uid_t uid, gid_t gid)
- bool FileCopy (const std::string &source_path, const std::string &destination_-path)
- bool FileCopy (const std::string &source_path, int destination_handle)
- bool FileCopy (int source_handle, const std::string &destination_path)
- bool FileCopy (int source_handle, int destination_handle)
- bool FileRead (const std::string &filename, std::list< std::string > &data, uid_t uid=0, gid_t gid=0)
- bool FileRead (const std::string &filename, std::string &data, uid_t uid=0, gid_t gid=0)
- bool FileCreate (const std::string &filename, const std::string &data, uid_t uid=0, gid_t gid=0, mode_t mode=0)
- bool FileStat (const std::string &path, struct stat ∗st, bool follow_symlinks)
- bool FileStat (const std::string &path, struct stat ∗st, uid_t uid, gid_t gid, bool follow_symlinks)
- bool FileLink (const std::string &oldpath, const std::string &newpath, bool symbolic)
- bool FileLink (const std::string &oldpath, const std::string &newpath, uid_t uid, gid_t gid, bool symbolic)
- std::string FileReadLink (const std::string &path)
- std::string FileReadLink (const std::string &path, uid_t uid, gid_t gid)
- bool FileDelete (const std::string &path)
- bool FileDelete (const std::string &path, uid_t uid, gid_t gid)
- bool DirCreate (const std::string &path, mode_t mode, bool with_parents=false)
- bool DirCreate (const std::string &path, uid_t uid, gid_t gid, mode_t mode, bool with_parents=false)
- bool DirDelete (const std::string &path)
- bool DirDelete (const std::string &path, uid_t uid, gid_t gid)
- bool TmpDirCreate (std::string &path)

- bool TmpFileCreate (std::string &filename, const std::string &data, uid_t uid=0, gid_t gid=0, mode_t mode=0)
- bool CanonicalDir (std::string &name, bool leading_slash=true)
- void GUID (std::string &guid)
- std::string UUID (void)
- std::ostream & operator<< (std::ostream &os, LogLevel level)
- LogLevel string_to_level (const std::string &str)
- bool istring_to_level (const std::string &llStr, LogLevel &ll)
- bool string_to_level (const std::string &str, LogLevel &ll)
- std::string level_to_string (const LogLevel &level)
- LogLevel old_level_to_level (unsigned int old_level)
- template<typename T >
  T stringto (const std::string &s)
- template<typename T >
  bool stringto (const std::string &s, T &t)
- bool strtoint (const std::string &s, signed int &t, int base=10)
- bool strtoint (const std::string &s, unsigned int &t, int base=10)
- bool strtoint (const std::string &s, signed long &t, int base=10)
- bool strtoint (const std::string &s, unsigned long &t, int base=10)
- bool strtoint (const std::string &s, signed long long &t, int base=10)
- bool strtoint (const std::string &s, unsigned long long &t, int base=10)
- template<typename T >
  std::string tostring (T t, int width=0, int precision=0)
- std::string inttostr (signed long long t, int base=10, int width=0)
- std::string inttostr (unsigned long long t, int base=10, int width=0)
- std::string inttostr (signed int t, int base=10, int width=0)
- std::string inttostr (unsigned int t, int base=10, int width=0)
- std::string inttostr (signed long t, int base=10, int width=0)
- std::string inttostr (unsigned long t, int base=10, int width=0)
- std::string booltostr (bool b)
- bool strtobool (const std::string &s)
- bool strtobool (const std::string &s, bool &b)
- std::string lower (const std::string &s)
- std::string upper (const std::string &s)
- void tokenize (const std::string &str, std::vector< std::string > &tokens, const std::string &delimiters=" ", const std::string &start_quotes="", const std::string &end_quotes="")
- void tokenize (const std::string &str, std::list< std::string > &tokens, const std::string &delimiters=" ", const std::string &start_quotes="", const std::string &end_quotes="")
- std::string::size_type get_token (std::string &token, const std::string &str, std::string::size_type pos, const std::string &delimiters=" ", const std::string &start_quotes="", const std::string &end_quotes="")
- std::string trim (const std::string &str, const char *sep=NULL)
- std::string strip (const std::string &str)
- std::string uri_encode (const std::string &str, bool encode_slash)
- std::string uri_unencode (const std::string &str)

- std::string convert_to_rdn (const std::string &dn)
- std::string escape_chars (const std::string &str, const std::string &chars, char esc, bool excl, escape_type type=escape_char)
- std::string unescape_chars (const std::string &str, char esc, escape_type type=escape_char)
- bool CreateThreadFunction (void(∗func)(void ∗), void ∗arg, SimpleCounter ∗count=NULL)
- std::list< URL > ReadURLList (const URL &urllist)
- std::string GetEnv (const std::string &var)
- std::string GetEnv (const std::string &var, bool &found)
- bool SetEnv (const std::string &var, const std::string &value, bool overwrite=true)
- void UnsetEnv (const std::string &var)
- void EnvLockWrap (bool all=false)
- void EnvLockUnwrap (bool all=false)
- void EnvLockUnwrapComplete (void)
- std::string StrError (int errnum=errno)
- bool MatchXMLName (const XMLNode &node1, const XMLNode &node2)
- bool MatchXMLName (const XMLNode &node, const char ∗name)
- bool MatchXMLName (const XMLNode &node, const std::string &name)
- bool MatchXMLNamespace (const XMLNode &node1, const XMLNode &node2)
- bool MatchXMLNamespace (const XMLNode &node, const char ∗uri)
- bool MatchXMLNamespace (const XMLNode &node, const std::string &uri)
- bool createVOMSAC (std::string &codedac, Credential &issuer_cred, Credential &holder_cred, std::vector< std::string > &fqan, std::vector< std::string > &targets, std::vector< std::string > &attributes, std::string &voname, std::string &uri, int lifetime)
- bool addVOMSAC (ArcCredential::AC ∗∗&aclist, std::string &acorder, std::string &decodedac)
- bool parseVOMSAC (X509 ∗holder, const std::string &ca_cert_dir, const std::string &ca_cert_file, VOMSTrustList &vomscert_trust_dn, std::vector< VOMSACInfo > &output, bool verify=true, bool reportall=false)
- bool parseVOMSAC (const Credential &holder_cred, const std::string &ca_cert_dir, const std::string &ca_cert_file, VOMSTrustList &vomscert_trust_dn, std::vector< VOMSACInfo > &output, bool verify=true, bool reportall=false)
- char ∗ VOMSDecode (const char ∗data, int size, int ∗j)
- std::string getCredentialProperty (const Arc::Credential &u, const std::string &property, const std::string &ca_cert_dir=std::string(""), const std::string &ca_cert_file=std::string(""), const std::vector< std::string > &voms_trust_list=std::vector< std::string >())
- bool OpenSSLInit (void)
- void HandleOpenSSLError (void)
- void HandleOpenSSLError (int code)
- std::string string (StatusKind kind)
- const char ∗ ContentFromPayload (const MessagePayload &payload)
- void WSAFaultAssign (SOAPEnvelope &mesage, WSAFault fid)
- WSAFault WSAFaultExtract (SOAPEnvelope &message)

- int passphrase_callback (char ∗buf, int size, int rwflag, void ∗)
- bool init_xmlsec (void)
- bool final_xmlsec (void)
- std::string get_cert_str (const char ∗certfile)
- xmlSecKey ∗ get_key_from_keystr (const std::string &value)
- xmlSecKey ∗ get_key_from_keyfile (const char ∗keyfile)
- std::string get_key_from_certfile (const char ∗certfile)
- xmlSecKey ∗ get_key_from_certstr (const std::string &value)
- xmlSecKeysMngrPtr load_key_from_keyfile (xmlSecKeysMngrPtr ∗keys_-manager, const char ∗keyfile)
- xmlSecKeysMngrPtr load_key_from_certfile (xmlSecKeysMngrPtr ∗keys_-manager, const char ∗certfile)
- xmlSecKeysMngrPtr load_key_from_certstr (xmlSecKeysMngrPtr ∗keys_-manager, const std::string &certstr)
- xmlSecKeysMngrPtr load_trusted_cert_file (xmlSecKeysMngrPtr ∗keys_-manager, const char ∗cert_file)
- xmlSecKeysMngrPtr load_trusted_cert_str (xmlSecKeysMngrPtr ∗keys_-manager, const std::string &cert_str)
- xmlSecKeysMngrPtr load_trusted_certs (xmlSecKeysMngrPtr ∗keys_manager, const char ∗cafile, const char ∗capath)
- XMLNode get_node (XMLNode &parent, const char ∗name)

Variables

- const Glib::TimeVal ETERNAL
- const Glib::TimeVal HISTORIC
- const size_t thread_stacksize = (16 ∗ 1024 ∗ 1024)
- Logger CredentialLogger
- const char ∗ plugins_table_name

4.1.1 Detailed Description

Arc namespace contains all core ARC classes.

4.1.2 Typedef Documentation

4.1.2.1 typedef AttrMap::const_iterator Arc::AttrConstIter

A typedef of a const_iterator for AttrMap.

This typedef is used as a shorthand for a const_iterator for AttrMap. It is used extensively within the MessageAttributes class as well as the AttributesIterator class, but is not visible externally.

4.1.2.2 typedef AttrMap::iterator **Arc::AttrIter**

A typedef of an (non-const) iterator for AttrMap.

This typedef is used as a shorthand for a (non-const) iterator for AttrMap. It is used in one method within the MessageAttributes class, but is not visible externally.

4.1.2.3 typedef std::multimap<std::string,std::string> **Arc::AttrMap**

A typefed of a multimap for storage of message attributes.

This typedef is used as a shorthand for a multimap that uses strings for keys as well as values. It is used within the MesssageAttributes class for internal storage of message attributes, but is not visible externally.

4.1.2.4 typedef **Plugin**∗(∗ **Arc::get_plugin_instance)(PluginArgument** ∗arg)

Constructor function of ARC lodable component.

This function is called with plugin-specific argument and should produce and return valid instance of plugin. If plugin can't be produced by any reason (for example because passed argument is not applicable) then NULL is returned. No exceptions should be raised.

4.1.3 Enumeration Type Documentation

4.1.3.1 enum **Arc::escape_type**

Type of escaping or encoding to use.

Enumerator:

escape_octal place the escape character before the character being escaped

escape_hex octal encoding of the character hex encoding of the character

4.1.3.2 enum **Arc::LogFormat**

Output formats.

Defines prefix for every message. LongFormat - all informatino about message is printed ShortFormat - only message level is printed DebugFormat - message time (microsecond precision) and time difference from previous message are printed. This format is mostly meant for profiling. EmptyFormat - only message is printed

4.1.3.3 enum **Arc::LogLevel**

Logging levels.

Logging levels for tagging and filtering log messages. FATAL level designates very severe error events that will presumably lead the application to abort. ERROR level designates error events that might still allow the application to continue running. WARNING level designates potentially harmful situations. INFO level designates informational messages that highlight the progress of the application at coarse-grained level. VERBOSE level designates fine-grained informational events that will give additional information about the application. DEBUG level designates finer-grained informational events which should only be used for debugging purposes.

4.1.3.4 enum Arc::StatusKind

Status kinds (types)

This enum defines a set of possible status kinds.

Enumerator:

- ***STATUS_OK*** Default status - undefined error.
- ***GENERIC_ERROR*** No error.
- ***PARSING_ERROR*** Error does not fit any class.
- ***PROTOCOL_RECOGNIZED_ERROR*** Error detected while parsing request/response.
- ***UNKNOWN_SERVICE_ERROR*** Message does not fit into expected protocol.
- ***BUSY_ERROR*** There is no destination configured for this message.
- ***SESSION_CLOSE*** Message can't be processed now.

4.1.3.5 enum Arc::WSAFault

WS-Addressing possible faults.

Enumerator:

- ***WSAFaultUnknown*** This is not a fault
- ***WSAFaultInvalidAddressingHeader*** This is not a WS-Addressing fault

4.1.4 Function Documentation

4.1.4.1 bool Arc::addVOMSAC (ArcCredential::AC **& *aclist*, std::string & *acorder*, std::string & *decodedac*)

Add decoded AC string into a list of AC objects

Parameters

aclist	The list of AC objects (output)
acorder	The order of AC objects (output)
decodedac	The AC string that is decoded from the string returned from voms server (input)

4.1.4.2 bool Arc::CanonicalDir (std::string & *name*, bool *leading_slash* = `true`)

Removes /../ from 'name'. If leading_slash=true '/' will be added at the beginning of 'name' if missing. Otherwise it will be removed. The directory separator used here depends on the platform. Returns false if it is not possible to remove all the ../

4.1.4.3 const char∗ Arc::ContentFromPayload (const MessagePayload & *payload*)

Returns pointer to main memory chunk of Message payload.

If no buffer is present or if payload is not of PayloadRawInterface type NULL is returned.

4.1.4.4 bool Arc::CreateThreadFunction (void(∗)(void ∗) *func*, void ∗ *arg*, SimpleCounter ∗ *count* = `NULL`)

This macro behaves like function which makes thread of class' method.

It accepts class instance and full name of method - like class::method. 'method' should not be static member of the class. Result is true if creation of thread succeeded. - Specified instance must be valid during whole lifetime of thread. So probably it is safer to destroy 'instance' in 'method' just before exiting. Helper function to create simple thread. It takes care of all pecularities of Glib::Thread API. As result it runs function 'func' with argument 'arg' in a separate thread. If count parameter not NULL then corresponding object will be incremented before function returns and then decremented then thread finished. Returns true on success.

4.1.4.5 bool Arc::createVOMSAC (std::string & *codedac*, Credential & *issuer_cred*, Credential & *holder_cred*, std::vector< std::string > & *fqan*, std::vector< std::string > & *targets*, std::vector< std::string > & *attributes*, std::string & *voname*, std::string & *uri*, int *lifetime*)

Create AC(Attribute Certificate) with voms specific format.

Parameters

codedac	The coded AC as output of this method
issuer_cred	The issuer credential which is used to sign the AC
holder_cred	The holder credential, the holder certificate is the one which carries AC The rest arguments are the same as the above method

4.1.4.6 bool Arc::DirCreate (const std::string & *path*, uid_t *uid*, gid_t *gid*, mode_t *mode*, bool *with_parents* = `false`)

Create a new directory using the specified uid and gid Specified uid and gid are used for accessing filesystem.

4.1.4.7 bool Arc::DirDelete (const std::string & *path*, uid_t *uid*, gid_t *gid*)

Delete a directory using the specified uid and gid Specified uid and gid are used for accessing filesystem.

4.1.4.8 void Arc::EnvLockUnwrap (bool *all* = `false`)

End code which is using setenv/getenv. Value of all must be same as in corresponding EnvLockWrap.

4.1.4.9 void Arc::EnvLockWrap (bool *all* = `false`)

Start code which is using setenv/getenv. Use all=true for setenv and all=false for getenv. Must always have corresponding EnvLockUnwrap.

4.1.4.10 std::string Arc::escape_chars (const std::string & *str*, const std::string & *chars*, char *esc*, bool *excl*, escape_type *type* = `escape_char`)

Escape or encode the given chars in str using the escape character esc. If excl is true then escape all characters not in chars

4.1.4.11 bool Arc::FileCopy (const std::string & *source_path*, const std::string & *destination_path*, uid_t *uid*, gid_t *gid*)

Utility functions for handling files and directories. Those functions offer posibility to access files and directories under user and group ids different from those of current user. Id switching is done in way safe for muti-threaded application. If any of specified ids is 0 then such id is not switched and current id is used instead. Copy file source_-path to file destination_path. Specified uid and gid are used for accessing filesystem.

4.1.4.12 bool Arc::FileCreate (const std::string & *filename*, const std::string & *data*, uid_t *uid* = `0`, gid_t *gid* = `0`, mode_t *mode* = `0`)

Simple method to create a new file containing given data. Specified uid and gid are used for accessing filesystem. An existing file is overwritten with the new data. Permissions of the created file are determined using the current umask. If protected access is required, FileLock should be used in addition to FileRead. If uid/gid are zero then no real switch of uid/gid is done.

4.1.4.13 bool Arc::FileDelete (const std::string & *path*, uid_t *uid*, gid_t *gid*)

Deletes file at path using the specified uid and gid Specified uid and gid are used for accessing filesystem.

4.1.4.14 bool Arc::FileLink (const std::string & *oldpath*, const std::string & *newpath*, uid_t *uid*, gid_t *gid*, bool *symbolic*)

Make symbolic or hard link of file using the specified uid and gid Specified uid and gid are used for accessing filesystem.

4.1.4.15 bool Arc::FileRead (const std::string & *filename*, std::list< std::string > & *data*, uid_t *uid* = 0, gid_t *gid* = 0)

Simple method to read file content from filename. Specified uid and gid are used for accessing filesystem. The content is split into lines with the new line character removed, and the lines are returned in the data list. If protected access is required, FileLock should be used in addition to FileRead.

4.1.4.16 bool Arc::FileRead (const std::string & *filename*, std::string & *data*, uid_t *uid* = 0, gid_t *gid* = 0)

Simple method to read whole file content from filename. Specified uid and gid are used for accessing filesystem.

4.1.4.17 std::string Arc::FileReadLink (const std::string & *path*, uid_t *uid*, gid_t *gid*)

Returns path at which symbolic link is pointing using the specified uid and gid Specified uid and gid are used for accessing filesystem.

4.1.4.18 bool Arc::FileStat (const std::string & *path*, struct stat * *st*, uid_t *uid*, gid_t *gid*, bool *follow_symlinks*)

Stat a file using the specified uid and gid and put info into the st struct Specified uid and gid are used for accessing filesystem.

4.1.4.19 bool Arc::final_xmlsec (void)

Finalize the xml security library

4.1.4.20 std::string Arc::get_cert_str (const char * *certfile*)

Get certificate in string format from certificate file

4.1.4.21 std::string Arc::get_key_from_certfile (const char * *certfile*)

Get public key in string format from certificate file

4.1.4.22 xmlSecKey∗ Arc::get_key_from_certstr (const std::string & *value*)

Get public key in xmlSecKey structure from certificate string (the string under "-----BEGIN CERTIFICATE-----" and "-----END CERTIFICATE-----")

4.1.4.23 xmlSecKey∗ Arc::get_key_from_keyfile (const char ∗ *keyfile*)

Get key in xmlSecKey structure from key file

4.1.4.24 xmlSecKey∗ Arc::get_key_from_keystr (const std::string & *value*)

Get key in xmlSecKey structure from key in string format

4.1.4.25 XMLNode Arc::get_node (XMLNode & *parent*, const char ∗ *name*)

Generate a new child XMLNode with specified name

4.1.4.26 std::string Arc::getCredentialProperty (const Arc::Credential & *u*, const std::string & *property*, const std::string & *ca_cert_dir* = `std::string("")`, const std::string & *ca_cert_file* = `std::string("")`, const std::vector< std::string > & *voms_trust_list* = `std::vector< std::string >()`)

Extract the needed field from the certificate.

Parameters

u	The proxy certificate which includes the voms specific formated AC.
property	The property that caller would get, including: dn, voms:vo, voms:role, voms:group
ca_cert_dir	
ca_cert_file	
voms_trust-_list	the dn chain that is trusted when parsing voms AC

4.1.4.27 void Arc::GUID (std::string & *guid*)

Utilities for generating unique identifiers in the form 12345678-90ab-cdef-1234-567890abcdef.

Generates a unique identifier using information such as IP address, current time etc.

4.1.4.28 bool Arc::init_xmlsec (void)

Initialize the xml security library, it should be called before the xml security functionality is used.

4.1.4.29 std::string Arc::inttostr (signed long long *t*, int *base* = `10`, int *width* = `0`)

Convert long long integer to textual representation for specied base. Result is padded with zeroes on left till width.

Referenced by inttostr().

4.1.4.30 std::string Arc::inttostr (unsigned long long *t*, int *base* = `10`, int *width* = `0`)

Convert unsigned long long integer to textual representation for specied base. Result is padded with zeroes on left till width.

4.1.4.31 std::string Arc::inttostr (signed int *t*, int *base* = `10`, int *width* = `0`) `[inline]`

Convert integer to textual representation for specied base. Result is padded with zeroes on left till width.

References inttostr().

4.1.4.32 std::string Arc::inttostr (unsigned int *t*, int *base* = `10`, int *width* = `0`) `[inline]`

Convert unsigned integer to textual representation for specied base. Result is padded with zeroes on left till width.

References inttostr().

4.1.4.33 std::string Arc::inttostr (signed long *t*, int *base* = `10`, int *width* = `0`) `[inline]`

Convert long integer to textual representation for specied base. Result is padded with zeroes on left till width.

References inttostr().

4.1.4.34 std::string Arc::inttostr (unsigned long *t*, int *base* = `10`, int *width* = `0`) `[inline]`

Convert unsigned long integer to textual representation for specied base. Result is padded with zeroes on left till width.

References inttostr().

4.1.4.35 bool Arc::istring_to_level (const std::string & *llStr*, LogLevel & *ll*)

Case-insensitive parsing of a string to a LogLevel with error response.

The method will try to parse (case-insensitive) the argument string to a corresponding LogLevel. If the method suceeds, true will be returned and the argument *ll* will be set to the parsed LogLevel. If the parsing fails `false` will be returned. The parsing succeeds if *llStr* match (case-insensitively) one of the names of the LogLevel members.

Parameters

llStr	a string which should be parsed to a Arc::LogLevel.
ll	a Arc::LogLevel reference which will be set to the matching Arc::Log-Level upon successful parsing.

Returns

`true` in case of successful parsing, otherwise `false`.

See also

LogLevel

4.1.4.36 xmlSecKeysMngrPtr Arc::load_key_from_certfile (xmlSecKeysMngrPtr ∗ *keys_manager*, const char ∗ *certfile*)

Load public key from a certificate file into key manager

4.1.4.37 xmlSecKeysMngrPtr Arc::load_key_from_certstr (xmlSecKeysMngrPtr ∗ *keys_manager*, const std::string & *certstr*)

Load public key from a certificate string into key manager

4.1.4.38 xmlSecKeysMngrPtr Arc::load_key_from_keyfile (xmlSecKeysMngrPtr ∗ *keys_manager*, const char ∗ *keyfile*)

Load private or public key from a key file into key manager

4.1.4.39 xmlSecKeysMngrPtr Arc::load_trusted_cert_file (xmlSecKeysMngrPtr ∗ *keys_manager*, const char ∗ *cert_file*)

Load trusted certificate from certificate file into key manager

4.1.4.40 xmlSecKeysMngrPtr Arc::load_trusted_cert_str (xmlSecKeysMngrPtr ∗ *keys_manager*, const std::string & *cert_str*)

Load trusted certificate from cetrtificate string into key manager

4.1.4.41 xmlSecKeysMngrPtr Arc::load_trusted_certs (xmlSecKeysMngrPtr ∗ *keys_manager*, const char ∗ *cafile*, const char ∗ *capath*)

Load trusted cetificates from a file or directory into key manager

4.1.4.42 bool Arc::MatchXMLName (const XMLNode & *node1*, const XMLNode & *node2*)

Returns true if underlying XML elements have same names

4.1.4.43 bool Arc::MatchXMLName (const XMLNode & *node*, const char * *name*)

Returns true if 'name' matches name of 'node'. If name contains prefix it's checked too

4.1.4.44 bool Arc::MatchXMLName (const XMLNode & *node*, const std::string & *name*)

Returns true if 'name' matches name of 'node'. If name contains prefix it's checked too

4.1.4.45 bool Arc::MatchXMLNamespace (const XMLNode & *node1*, const XMLNode & *node2*)

Returns true if underlying XML elements belong to same namespaces

4.1.4.46 bool Arc::MatchXMLNamespace (const XMLNode & *node*, const char * *uri*)

Returns true if 'namespace' matches 'node's namespace.

4.1.4.47 bool Arc::MatchXMLNamespace (const XMLNode & *node*, const std::string & *uri*)

Returns true if 'namespace' matches 'node's namespace.

4.1.4.48 bool Arc::OpenSSLInit (void)

This module contains various convenience utilities for using OpenSSL.

Application may be linked to this module instead of OpenSSL libraries directly. This function initializes OpenSSL library. It may be called multiple times and makes sure everything is done properly and OpenSSL may be used in multi-threaded environment. Because this function makes use of ArcLocation it is advisable to call it after ArcLocation::Init().

4.1.4.49 std::ostream& Arc::operator<< (std::ostream & *os*, LogLevel *level*)

Printing of LogLevel values to ostreams.

Output operator so that LogLevel values can be printed in a nicer way.

4.1.4.50 std::ostream& Arc::operator<< (std::ostream & , const Period &)

Prints a Period-object to the given ostream -- typically cout.

4.1.4.51 std::ostream& Arc::operator<< (std::ostream & , const Time &)

Prints a Time-object to the given ostream -- typically cout.

4.1.4.52 bool Arc::parseVOMSAC (X509 ∗ *holder,* const std::string & *ca_cert_dir,* const std::string & *ca_cert_file,* VOMSTrustList & *vomscert_trust_dn,* std::vector< VOMSACInfo > & *output,* bool *verify* = `true`, bool *reportall* = `false`)

Parse the certificate, and output the attributes.

Parameters

holder	The proxy certificate which includes the voms specific formated AC.
ca_cert_dir	The trusted certificates which are used to verify the certificate which is used to sign the AC
ca_cert_file	The same as ca_cert_dir except it is a file instead of a directory. Only one of them need to be set
vomsdir	The directory which include ∗.lsc file for each vo. - For instance, a vo called "knowarc.eu" should have file $prefix/vomsdir/knowarc/voms.knowarc.eu.lsc which contains on the first line the DN of the VOMS server, and on the second line the corresponding CA DN: /O=Grid/O=NorduGrid/OU=Know-ARC/CN=voms.knowarc.eu /O=Grid/O=NorduGrid/CN=NorduGrid Certification Authority See more in : `https://twiki.-cern.ch/twiki/bin/view/LCG/VomsFAQforService-Managers`
output	The parsed attributes (Role and Generic Attribute) . Each attribute is stored in element of a vector as a string. It is up to the consumer to understand the meaning of the attribute. There are two types of attributes stored in VOMS AC: AC_IETFATTR, AC_FULL_ATTRIBU-TES. The AC_IETFATTR will be like /Role=Employee/Group=Tester/-Capability=NULL The AC_FULL_ATTRIBUTES will be like knowarc:-Degree=PhD (qualifier::name=value) In order to make the output at-tribute values be identical, the voms server information is added as pre-fix of the original attributes in AC. for AC_FULL_ATTRIBUTES, the von-ame + hostname is added: /voname=knowarc.eu/hostname=arthur.-hep.lu.se:15001//knowarc.eu/coredev:attribute1=1 for AC_IETFATTR, the 'VO' (voname) is added: /VO=knowarc.eu/Group=coredev/Role=-NULL/Capability=NULL /VO=knowarc.eu/Group=testers/Role=NULL/-Capability=NULL

some other redundant attributes is provided: voname=knowarc.eu/hostname=arthur.-hep.lu.se:15001

Parameters

verify	true: Verify the voms certificate is trusted based on the ca_cert_dir/ca_-cert_file which specifies the CA certificates, and the vomscert_trust_dn which specifies the trusted DN chain from voms server certificate to -CA certificate. false: Not verify, which means the issuer of AC (voms server certificate is supposed to be trusted by default). In this case the parameters 'ca_cert_dir', 'ca_cert_file' and 'vomscert_trust_dn' will not effect, and may be left empty. This case is specifically used by 'arcproxy --info' to list all of the attributes in AC, and not to need to verify if the AC's issuer is trusted.
reportall	If set to true fills output with all attributes including those which failed passing test procedures. Validity of attributes can be checked through status members of output items. Combination of verify=true and reportall=true provides most information.

4.1.4.53 bool Arc::parseVOMSAC (const Credential & *holder_cred,* const std::string & *ca_cert_dir,* const std::string & *ca_cert_file,* VOMSTrustList & *vomscert_trust_dn,* std::vector< VOMSACInfo > & *output,* bool *verify* = `true`, bool *reportall* = `false`)

Parse the certificate. Similar to above one, but collects information From all certificates in a chain.

4.1.4.54 int Arc::passphrase_callback (char ∗ *buf,* int *size,* int *rwflag,* void ∗)

callback method for inputing passphrase of key file

4.1.4.55 std::string Arc::string (StatusKind *kind*)

Conversion to string.

Conversion from StatusKind to string.

Parameters

kind	The StatusKind to convert.

Referenced by Arc::PayloadStream::Get().

4.1.4.56 bool Arc::strtobool (const std::string & *s*) `[inline]`

Convert string to bool. Simply checks string if equal to "true" or "1".

4.1.4.57 bool Arc::strtobool (const std::string & *s,* bool & *b*) `[inline]`

Convert string to bool Checks whether string is equal to one of "true", "false", "1" or "0", and if not returns false. If equal, true is returned and the bool reference is set to true, if string equals "true" or "1", otherwise it is set to false.

4.1.4.58 bool Arc::strtoint (const std::string & *s*, signed int & *t*, int *base* = `10`)

Convert string to integer with specified base. Returns false if any argument is wrong.

4.1.4.59 bool Arc::strtoint (const std::string & *s*, unsigned int & *t*, int *base* = `10`)

Convert string to unsigned integer with specified base. Returns false if any argument is wrong.

4.1.4.60 bool Arc::strtoint (const std::string & *s*, signed long & *t*, int *base* = `10`)

Convert string to long integer with specified base. Returns false if any argument is wrong.

4.1.4.61 bool Arc::strtoint (const std::string & *s*, unsigned long & *t*, int *base* = `10`)

Convert string to unsigned long integer with specified base. Returns false if any argument is wrong.

4.1.4.62 bool Arc::strtoint (const std::string & *s*, signed long long & *t*, int *base* = `10`)

Convert string to long long integer with specified base. Returns false if any argument is wrong.

4.1.4.63 bool Arc::strtoint (const std::string & *s*, unsigned long long & *t*, int *base* = `10`)

Convert string to unsigned long long integer with specified base. Returns false if any argument is wrong.

4.1.4.64 std::string Arc::TimeStamp (const TimeFormat & = `Time::GetFormat()`)

Returns a time-stamp of the current time in some format.

4.1.4.65 std::string Arc::TimeStamp (Time , const TimeFormat & = `Time::GetFormat()`)

Returns a time-stamp of some specified time in some format.

4.1.4.66 bool Arc::TmpDirCreate (std::string & *path*)

Create a temporary directory under the system defined temp location, and return its path.

Uses mkdtemp if available, and a combination of random parameters if not. This latter method is not as safe as mkdtemp.

4.1.4.67 bool Arc::TmpFileCreate (std::string & *filename,* const std::string & *data,* uid_t *uid =* 0, gid_t *gid =* 0, mode_t *mode =* 0)

Simple method to create a temporary file containing given data. Specified uid and gid are used for accessing filesystem. Permissions of the created file are determined using the current umask. If uid/gid are zero then no real switch of uid/gid is done. Input value of filename argument is ignored. On output it contains path to created file. Content of data argument is written into created file.

4.1.4.68 std::string Arc::uri_encode (const std::string & *str,* bool *encode_slash*)

This method %-encodes characters in URI str.

Characters which are not unreserved according to RFC 3986 are encoded. If encode-_slash is true forward slashes will also be encoded. It is useful to set encode_slash to false when encoding full paths. be encoded

4.1.4.69 char* Arc::VOMSDecode (const char * *data,* int *size,* int * *j*)

Decode the data which is encoded by voms server. Since voms code uses some specific coding method (not base64 encoding), we simply copy the method from voms code to here

4.1.4.70 void Arc::WSAFaultAssign (SOAPEnvelope & *mesage,* WSAFault *fid*)

Makes WS-Addressing fault.

It fills SOAP Fault message with WS-Addressing fault related information.

4.1.4.71 WSAFault Arc::WSAFaultExtract (SOAPEnvelope & *message*)

Gets WS-addressing fault.

Analyzes SOAP Fault message and returns WS-Addressing fault it represents.

4.1.5 Variable Documentation

4.1.5.1 Logger Arc::CredentialLogger

Logger to be used by all modules of credentials library

4.1.5.2 const char* Arc::plugins_table_name

Name of symbol refering to table of plugins.

This C null terminated string specifies name of symbol which shared library should export to give an access to an array of PluginDescriptor elements. The array is terminated by element with all components set to NULL.

4.1.5.3 const size_t Arc::thread_stacksize = (16 * 1024 * 1024)

This module provides convenient helpers for Glibmm interface for thread management.

So far it takes care of automatic initialization of threading environment and creation of simple detached threads. Always use it instead of glibmm/thread.h and keep among first includes. It safe to use it multiple times and to include it both from source files and other include files. Defines size of stack assigned to every new thread.

4.2 ArcCredential Namespace Reference

Data Structures

- struct cert_verify_context
- struct PROXYPOLICY_st
- struct PROXYCERTINFO_st
- struct ACDIGEST
- struct ACIS
- struct ACFORM
- struct ACACI
- struct ACHOLDER
- struct ACVAL
- struct ACIETFATTR
- struct ACTARGET
- struct ACTARGETS
- struct ACATTR
- struct ACINFO
- struct ACC
- struct ACSEQ
- struct ACCERTS
- struct ACATTRIBUTE
- struct ACATTHOLDER
- struct ACFULLATTRIBUTES

Enumerations

- enum certType { CERT_TYPE_EEC, CERT_TYPE_CA, CERT_TYPE_GSI_3_I-MPERSONATION_PROXY, CERT_TYPE_GSI_3_INDEPENDENT_PROXY, × CERT_TYPE_GSI_3_LIMITED_PROXY, CERT_TYPE_GSI_3_RESTRICTED_-PROXY, CERT_TYPE_GSI_2_PROXY, CERT_TYPE_GSI_2_LIMITED_PROX-Y, CERT_TYPE_RFC_IMPERSONATION_PROXY, CERT_TYPE_RFC_INDE-PENDENT_PROXY, CERT_TYPE_RFC_LIMITED_PROXY, CERT_TYPE_RF-C_RESTRICTED_PROXY, CERT_TYPE_RFC_ANYLANGUAGE_PROXY }

4.2.1 Detailed Description

Functions and constants for maintaining proxy certificates The code is derived from globus gsi, voms, and openssl-0.9.8e. The existing code for maintaining proxy certificates in OpenSSL only covers standard proxies and does not cover old Globus proxies, so here the Globus code is introduced.

Borrow the code about Attribute Certificate from VOMS The VOMSAttribute.h and VOMSAttribute.cpp are integration about code written by VOMS project, so here the original license follows.

4.2.2 Enumeration Type Documentation

4.2.2.1 enum ArcCredential::certType

Enumerator:

CERT_TYPE_EEC A end entity certificate

CERT_TYPE_CA A CA certificate

CERT_TYPE_GSI_3_IMPERSONATION_PROXY A X.509 Proxy Certificate - Profile (pre-RFC) compliant impersonation proxy

CERT_TYPE_GSI_3_INDEPENDENT_PROXY A X.509 Proxy Certificate Profile (pre-RFC) compliant independent proxy

CERT_TYPE_GSI_3_LIMITED_PROXY A X.509 Proxy Certificate Profile (pre-- RFC) compliant limited proxy

CERT_TYPE_GSI_3_RESTRICTED_PROXY A X.509 Proxy Certificate Profile (pre-RFC) compliant restricted proxy

CERT_TYPE_GSI_2_PROXY A legacy Globus impersonation proxy

CERT_TYPE_GSI_2_LIMITED_PROXY A legacy Globus limited impersonation proxy

CERT_TYPE_RFC_IMPERSONATION_PROXY A X.509 Proxy Certificate - Profile RFC compliant impersonation proxy; RFC inheritAll proxy

CERT_TYPE_RFC_INDEPENDENT_PROXY A X.509 Proxy Certificate Profile - RFC compliant independent proxy; RFC independent proxy

CERT_TYPE_RFC_LIMITED_PROXY A X.509 Proxy Certificate Profile RFC compliant limited proxy

CERT_TYPE_RFC_RESTRICTED_PROXY A X.509 Proxy Certificate Profile R-FC compliant restricted proxy

CERT_TYPE_RFC_ANYLANGUAGE_PROXY RFC anyLanguage proxy

4.3 DataStaging Namespace Reference

Data Structures

- class DataDelivery

  DataDelivery transfers data between specified physical locations.
- class DataDeliveryComm

  This class provides an abstract interface for the Delivery layer.
- class DataDeliveryCommHandler

  Singleton class handling all active DataDeliveryComm objects.
- class DataDeliveryLocalComm

  This class starts, monitors and controls a local Delivery process.
- class DataDeliveryRemoteComm

  This class contacts a remote service to make a Delivery request.
- class TransferParameters
- class CacheParameters

  The configured cache directories.
- class DTRCallback

  The base class from which all callback-enabled classes should be derived.
- class DTR

  Data Transfer Request.
- class DTRList

  Global list of all active DTRs in the system.
- class DTRStatus

  Class representing the status of a DTR.
- class DTRErrorStatus

  A class to represent error states reported by various components.
- class Generator

  Simple Generator implementation.
- class Processor

  The Processor performs pre- and post-transfer operations.
- class Scheduler

  The Scheduler is the control centre of the data staging framework.
- class TransferSharesConf

  TransferSharesConf describes the configuration of TransferShares.
- class TransferShares

  TransferShares is used to implement fair-sharing and priorities.

Typedefs

- typedef Arc::ThreadedPointer< DTR > DTR_ptr
- typedef Arc::ThreadedPointer < Arc::Logger > DTRLogger

Enumerations

- enum StagingProcesses
- enum ProcessState
- enum CacheState { CACHEABLE, NON_CACHEABLE, CACHE_ALREADY_P-RESENT, CACHE_DOWNLOADED, CACHE_LOCKED, CACHE_SKIP, CACH-E_NOT_USED }

4.3.1 Detailed Description

DataStaging contains all components for data transfer scheduling and execution.

4.3.2 Enumeration Type Documentation

4.3.2.1 enum DataStaging::CacheState

Represents possible cache states of this DTR.

Enumerator:

CACHEABLE Source should be cached.

NON_CACHEABLE Source should not be cached.

CACHE_ALREADY_PRESENT Source is available in cache from before.

CACHE_DOWNLOADED Source has just been downloaded and put in cache.

CACHE_LOCKED Cache file is locked.

CACHE_SKIP Source is cacheable but due to some problem should not be cached.

CACHE_NOT_USED Cache was started but was not used.

Chapter 5

Data Structure Documentation

5.1 ArcCredential::ACACI Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.2 ArcCredential::ACATTHOLDER Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.3 ArcCredential::ACATTR Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.4 ArcCredential::ACATTRIBUTE Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.5 ArcCredential::ACC Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.6 ArcCredential::ACCERTS Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.7 ArcCredential::ACDIGEST Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.8 ArcCredential::ACFORM Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.9 ArcCredential::ACFULLATTRIBUTES Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.10 ArcCredential::ACHOLDER Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.11 ArcCredential::ACIETFATTR Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.12 ArcCredential::ACINFO Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.13 ArcCredential::ACIS Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.14 ArcCredential::ACSEQ Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.15 ArcCredential::ACTARGET Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.16 ArcCredential::ACTARGETS Struct Reference

The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.17 ArcCredential::ACVAL Struct Reference

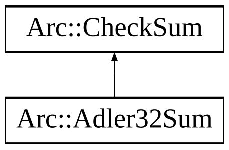
The documentation for this struct was generated from the following file:

- VOMSAttribute.h

5.18 Arc::Adler32Sum Class Reference

```
#include <CheckSum.h>
```

Inheritance diagram for Arc::Adler32Sum:



Public Member Functions

- virtual void start (void)
- virtual void add (void ∗buf, unsigned long long int len)
- virtual void end (void)
- virtual void result (unsigned char ∗&res, unsigned int &len) const
- virtual int print (char ∗buf, int len) const
- virtual void scan (const char ∗)
- virtual operator bool (void) const
- virtual bool operator! (void) const

5.18.1 Detailed Description

Implementation of Adler32 checksum.

This class is a specialized class of the CheckSum class. It provides an implementation of the Adler-32 checksum algorithm.

5.18.2 Member Function Documentation

5.18.2.1 virtual void Arc::Adler32Sum::add (void ∗ *buf,* unsigned long long int *len*) `[inline, virtual]`

Add data to be checksummed.

This method calculates the checksum of the passed data chuck, taking into account the previous state of this object.

Parameters

buf	pointer to data chuck to be checksummed.
len	size of the data chuck.

Implements Arc::CheckSum.

5.18.2.2 virtual void Arc::Adler32Sum::end (void) `[inline, virtual]`

Finalize the checksumming.

This method finalizes the checksum algorithm, that is calculating the final checksum result.

Implements Arc::CheckSum.

5.18.2.3 virtual int Arc::Adler32Sum::print (char ∗ *buf*, int *len*) const [inline, virtual]

Retrieve result of checksum into a string.

The passed string buf is filled with result of checksum algorithm in base 16. At most len chacters is filled into buffer buf. The hexadecimal value is prepended with "<algorithm>:", where <algorithm> is one of "cksum", "md5" or "adler32" respectively corresponding to the result from the CRC32Sum, MD5Sum and Adler32 classes.

Parameters

buf	pointer to buffer which should be filled with checksum result.
len	max number of character filled into buffer.

Reimplemented from Arc::CheckSum.

5.18.2.4 virtual void Arc::Adler32Sum::scan (const char ∗ *buf*) [inline, virtual]

Set internal checksum state.

This method sets the internal state to that of the passed textural representation. The format passed to this method must be the same as retrieved from the CheckSum::print method.

Parameters

buf	string containing textural representation of checksum

See also

CheckSum::print

Implements Arc::CheckSum.

5.18.2.5 virtual void Arc::Adler32Sum::start (void) [inline, virtual]

Initiate the checksum algorithm.

This method must be called before starting a new checksum calculation.

Implements Arc::CheckSum.

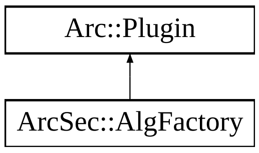
The documentation for this class was generated from the following file:

- CheckSum.h

5.19 ArcSec::AlgFactory Class Reference

```
#include <AlgFactory.h>
```

Inheritance diagram for ArcSec::AlgFactory:



Public Member Functions

- virtual CombiningAlg ∗ createAlg (const std::string &type)=0

5.19.1 Detailed Description

Interface for algorithm factory class.

AlgFactory is in charge of creating CombiningAlg according to the algorithm type given as argument of method createAlg. This class can be inherited for implementing a factory class which can create some specific combining algorithm objects.

5.19.2 Member Function Documentation

5.19.2.1 virtual **CombiningAlg**∗ ArcSec::AlgFactory::createAlg (const std::string & *type*) `[pure virtual]`

creat algorithm object based on the type algorithm type

Parameters

type	The type of combining algorithm

Returns

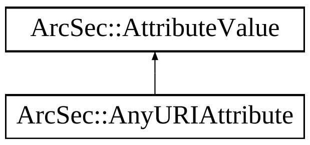
The object of CombiningAlg

The documentation for this class was generated from the following file:

- AlgFactory.h

5.20 ArcSec::AnyURIAttribute Class Reference

Inheritance diagram for ArcSec::AnyURIAttribute:



Public Member Functions

- virtual bool equal (AttributeValue ∗other, bool check_id=true)
- virtual std::string encode ()
- std::string getId ()
- virtual std::string getType ()

5.20.1 Member Function Documentation

5.20.1.1 virtual std::string ArcSec::AnyURIAttribute::encode ( ) `[inline, virtual]`

encode the value in a string format

Implements ArcSec::AttributeValue.

5.20.1.2 virtual bool ArcSec::AnyURIAttribute::equal (AttributeValue ∗ *value*, bool *check_id* `= true`) `[virtual]`

Evluate whether "this" equale to the parameter value

Implements ArcSec::AttributeValue.

5.20.1.3 std::string ArcSec::AnyURIAttribute::getId ( ) `[inline, virtual]`

Get the AttributeId of the <Attribute>

Implements ArcSec::AttributeValue.

5.20.1.4 virtual std::string ArcSec::AnyURIAttribute::getType ( ) `[inline, virtual]`

Get the DataType of the <Attribute>

Implements ArcSec::AttributeValue.

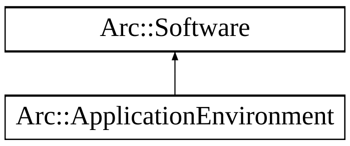
The documentation for this class was generated from the following file:

- AnyURIAttribute.h

5.21 Arc::ApplicationEnvironment Class Reference

```
#include <ExecutionTarget.h>
```

Inheritance diagram for Arc::ApplicationEnvironment:



5.21.1 Detailed Description

ApplicationEnvironment.

The ApplicationEnviroment is closely related to the definition given in GLUE2. By extending the Software class the two GLUE2 attributes AppName and AppVersion are mapped to two private members. However these can be obtained through the inheriated member methods getName and getVersion.

GLUE2 description: A description of installed application software or software environment characteristics available within one or more Execution Environments.

The documentation for this class was generated from the following file:

- ExecutionTarget.h

5.22 Arc::ApplicationType Class Reference

Data Fields

- ExecutableType Executable
- std::string Input
- std::string Output
- std::string Error
- std::list< ExecutableType > PreExecutable
- std::list< ExecutableType > PostExecutable
- std::string LogDir
- std::list< RemoteLoggingType > RemoteLogging

5.22.1 Field Documentation

5.22.1.1 std::string Arc::ApplicationType::Error

Standard error.

The Error string specifies the relative path to the job session directory of the file which standard error of the job should be written to.

5.22.1.2 ExecutableType Arc::ApplicationType::Executable

Main executable to be run.

The Executable object specifies the main executable which should be run by the job created by the job description enclosing this object. Note that in some job description languages specifying a main executable is not essential.

5.22.1.3 std::string Arc::ApplicationType::Input

Standard input.

The Input string specifies the relative path to the job session directory of the file to be used for standard input for the job.

5.22.1.4 std::string Arc::ApplicationType::LogDir

Name of logging directory.

The LogDir string specifies the name of the logging directory at the execution service which should be used to access log files for the job.

5.22.1.5 std::string Arc::ApplicationType::Output

Standard output.

The Output string specifies the relative path to the job session directory of the file which standard output of the job should be written to.

5.22.1.6 std::list<ExecutableType> Arc::ApplicationType::PostExecutable

Executables to be run after the main executable.

The PostExecutable object specifies a number of executables which should be executed after invoking the main application, where the main application is either the main executable (Executable) or the specified run time environment (RunTimeEnvironment in the ResourcesType class).

5.22.1.7 std::list<ExecutableType> Arc::ApplicationType::PreExecutable

Executables to be run before the main executable.

The PreExecutable object specifies a number of executables which should be executed before invoking the main application, where the main application is either the main executable (Executable) or the specified run time environment (RunTimeEnvironment in the ResourcesType class).

5.22.1.8 std::list<RemoteLoggingType> Arc::ApplicationType::RemoteLogging

Remote logging services.

The RemoteLogging list specifies the services to use for logging job information. See the RemoteLoggingType class for more details.

The documentation for this class was generated from the following file:

- JobDescription.h

5.23 Arc::ArcLocation Class Reference

```
#include <ArcLocation.h>
```

Static Public Member Functions

- static void Init (std::string path)
- static const std::string & Get ()
- static std::list< std::string > GetPlugins ()

5.23.1 Detailed Description

Determines ARC installation location.

5.23.2 Member Function Documentation

5.23.2.1 static std::list<std::string> Arc::ArcLocation::GetPlugins ( ) `[static]`

Returns ARC plugins directory location.

Main source is value of variable ARC_PLUGIN_PATH, otherwise path is derived from installation location.

5.23.2.2 static void Arc::ArcLocation::Init (std::string *path*) `[static]`

Initializes location information.

Main source is value of variable ARC_LOCATION, otherwise path to executable provided in is used. If nothing works then warning message is sent to logger and initial installation prefix is used.

The documentation for this class was generated from the following file:

- ArcLocation.h

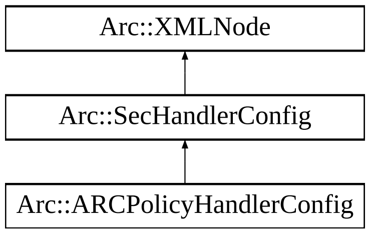
5.24 ArcSec::ArcPeriod Struct Reference

The documentation for this struct was generated from the following file:

- DateTimeAttribute.h

5.25 Arc::ARCPolicyHandlerConfig Class Reference

Inheritance diagram for Arc::ARCPolicyHandlerConfig:



The documentation for this class was generated from the following file:

- ClientInterface.h

5.26 Arc::ArcVersion Class Reference

```
#include <ArcVersion.h>
```

5.26.1 Detailed Description

Determines ARC HED libraries version.

The documentation for this class was generated from the following file:

- ArcVersion.h

5.27 ArcSec::Attr Struct Reference

```
#include <Request.h>
```

5.27.1 Detailed Description

Attr contains a tuple of attribute type and value.

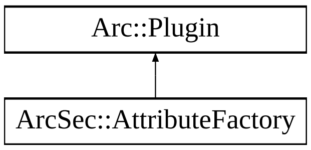
The documentation for this struct was generated from the following file:

- Request.h

5.28 ArcSec::AttributeFactory Class Reference

```
#include <AttributeFactory.h>
```

Inheritance diagram for ArcSec::AttributeFactory:



5.28.1 Detailed Description

Base attribute factory class

The documentation for this class was generated from the following file:

- AttributeFactory.h

5.29 Arc::AttributeIterator Class Reference

```
#include <MessageAttributes.h>
```

Public Member Functions

- AttributeIterator ()
- const std::string & operator∗ () const
- const std::string ∗ operator-> () const
- const std::string & key (void) const
- const AttributeIterator & operator++ ()
- AttributeIterator operator++ (int)
- bool hasMore () const

Protected Member Functions

- AttributeIterator (AttrConstIter begin, AttrConstIter end)

Protected Attributes

- AttrConstIter current_
- AttrConstIter end_

Friends

- class MessageAttributes

5.29.1 Detailed Description

A const iterator class for accessing multiple values of an attribute.

This is an iterator class that is used when accessing multiple values of an attribute. The getAll() method of the MessageAttributes class returns an AttributeIterator object that can be used to access the values of the attribute.

Typical usage is:

```
MessageAttributes attributes;
...
for (AttributeIterator iterator=attributes.getAll("Foo:Bar");
     iterator.hasMore(); ++iterator)
  std::cout << *iterator << std::endl;
```

5.29.2 Constructor & Destructor Documentation

5.29.2.1 Arc::AttributeIterator::AttributeIterator ( )

Default constructor.

The default constructor. Does nothing since all attributes are instances of well-behaving STL classes.

5.29.2.2 Arc::AttributeIterator::AttributeIterator (**AttrConstIter** *begin*, **AttrConstIter** *end*) `[protected]`

Protected constructor used by the MessageAttributes class.

This constructor is used to create an iterator for iteration over all values of an attribute. It is not supposed to be visible externally, but is only used from within the getAll() method of MessageAttributes class.

Parameters

begin	A const_iterator pointing to the first matching key-value pair in the internal multimap of the MessageAttributes class.
end	A const_iterator pointing to the first key-value pair in the internal multimap of the MessageAttributes class where the key is larger than the key searched for.

5.29.3 Member Function Documentation

5.29.3.1 bool Arc::AttributeIterator::hasMore ( ) const

Predicate method for iteration termination.

This method determines whether there are more values for the iterator to refer to.

Returns

Returns true if there are more values, otherwise false.

5.29.3.2 const std::string& Arc::AttributeIterator::key (void) const

The key of attribute.

This method returns reference to key of attribute to which iterator refers.

5.29.3.3 const std::string& Arc::AttributeIterator::operator* ( ) const

The dereference operator.

This operator is used to access the current value referred to by the iterator.

Returns

A (constant reference to a) string representation of the current value.

5.29.3.4 const AttributeIterator& Arc::AttributeIterator::operator++ ( )

The prefix advance operator.

Advances the iterator to the next value. Works intuitively.

Returns

A const reference to this iterator.

5.29.3.5 AttributeIterator Arc::AttributeIterator::operator++ (int)

The postfix advance operator.

Advances the iterator to the next value. Works intuitively.

Returns

An iterator referring to the value referred to by this iterator before the advance.

5.29.3.6 const std::string* Arc::AttributeIterator::operator-> ( ) const

The arrow operator.

Used to call methods for value objects (strings) conveniently.

5.29.4 Friends And Related Function Documentation

5.29.4.1 friend class MessageAttributes [friend]

The MessageAttributes class is a friend.

The constructor that creates an AttributeIterator that is connected to the internal multimap of the MessageAttributes class should not be exposed to the outside, but it still needs to be accessible from the getAll() method of the MessageAttributes class. - Therefore, that class is a friend.

5.29.5 Field Documentation

5.29.5.1 AttrConstIter Arc::AttributeIterator::current_ [protected]

A const_iterator pointing to the current key-value pair.

This iterator is the internal representation of the current value. It points to the corresponding key-value pair in the internal multimap of the MessageAttributes class.

5.29.5.2 AttrConstIter Arc::AttributeIterator::end_ [protected]

A const_iterator pointing beyond the last key-value pair.

A const_iterator pointing to the first key-value pair in the internal multimap of the - MessageAttributes class where the key is larger than the key searched for.

The documentation for this class was generated from the following file:

- MessageAttributes.h

5.30 ArcSec::AttributeProxy Class Reference

```
#include <AttributeProxy.h>
```

Public Member Functions

- virtual AttributeValue * getAttribute (const Arc::XMLNode &node)=0

5.30.1 Detailed Description

Interface for creating the AttributeValue object, it will be used by AttributeFactory.

The AttributeProxy object will be insert into AttributeFactoty; and the getAttribute(node) method will be called inside AttributeFacroty.createvalue(node), in order to create a specific AttributeValue

5.30.2 Member Function Documentation

5.30.2.1 virtual **AttributeValue**∗ ArcSec::AttributeProxy::getAttribute (const **Arc::XMLNode** & *node*) `[pure virtual]`

Create a AttributeValue object according to the information inside the XMLNode as parameter.

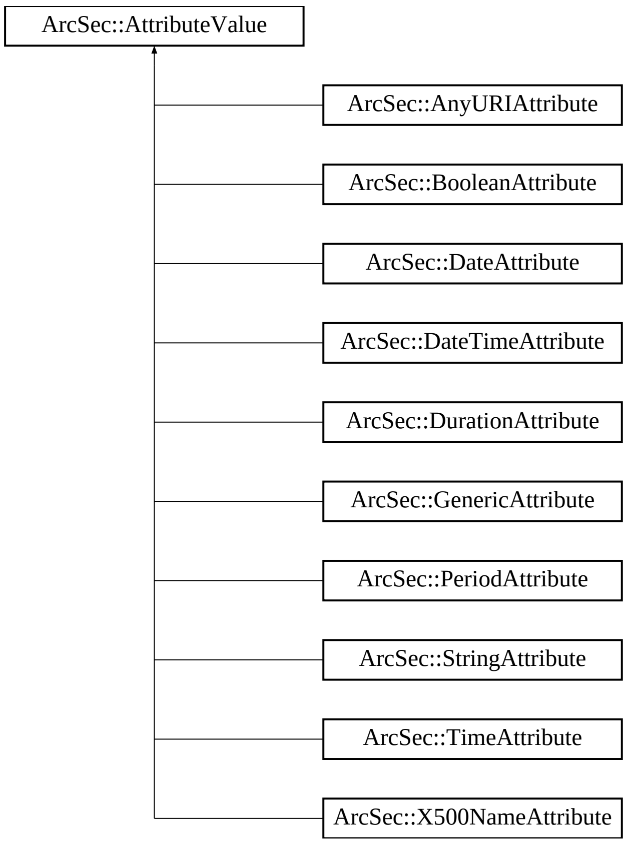
The documentation for this class was generated from the following file:

- AttributeProxy.h

5.31 ArcSec::AttributeValue Class Reference

`#include <AttributeValue.h>`

Inheritance diagram for ArcSec::AttributeValue:



Public Member Functions

- virtual bool equal (AttributeValue ∗value, bool check_id=true)=0
- virtual std::string encode ()=0
- virtual std::string getType ()=0
- virtual std::string getId ()=0

5.31.1 Detailed Description

Interface for containing different type of <Attribute> node for both policy and request.

<Attribute> contains different "Type" definition; Each type of <Attribute> needs different approach to compare the value. Any specific class which is for processing specific "Type" shoud inherit this class. The "Type" supported so far is: StringAttribute, DateAttribute, TimeAttribute, DurationAttribute, PeriodAttribute, AnyURIAttribute, X500-NameAttribute

5.31.2 Member Function Documentation

5.31.2.1 virtual std::string ArcSec::AttributeValue::encode ( ) [pure virtual]

encode the value in a string format

Implemented in ArcSec::PeriodAttribute, ArcSec::DurationAttribute, ArcSec::DateAttribute, ArcSec::TimeAttribute, ArcSec::DateTimeAttribute, ArcSec::GenericAttribute, ArcSec::StringAttribute, ArcSec::AnyURIAttribute, ArcSec::BooleanAttribute, and ArcSec::X500NameAttribute.

5.31.2.2 virtual bool ArcSec::AttributeValue::equal (AttributeValue * *value*, bool *check_id* = true) [pure virtual]

Evluate whether "this" equale to the parameter value

Implemented in ArcSec::PeriodAttribute, ArcSec::DurationAttribute, ArcSec::DateAttribute, ArcSec::TimeAttribute, ArcSec::DateTimeAttribute, ArcSec::GenericAttribute, ArcSec::AnyURIAttribute, ArcSec::BooleanAttribute, ArcSec::StringAttribute, and ArcSec::X500NameAttribute.

5.31.2.3 virtual std::string ArcSec::AttributeValue::getId ( ) [pure virtual]

Get the AttributeId of the <Attribute>

Implemented in ArcSec::PeriodAttribute, ArcSec::DurationAttribute, ArcSec::DateAttribute, ArcSec::TimeAttribute, ArcSec::DateTimeAttribute, ArcSec::GenericAttribute, ArcSec::StringAttribute, ArcSec::X500NameAttribute, ArcSec::AnyURIAttribute, and ArcSec::BooleanAttribute.

5.31.2.4 virtual std::string ArcSec::AttributeValue::getType ( ) [pure virtual]

Get the DataType of the <Attribute>

Implemented in ArcSec::PeriodAttribute, ArcSec::DurationAttribute, ArcSec::DateAttribute, ArcSec::TimeAttribute, ArcSec::DateTimeAttribute, ArcSec::AnyURIAttribute, ArcSec::BooleanAttribute, ArcSec::GenericAttribute, ArcSec::StringAttribute, and ArcSec::X500NameAttribute.

The documentation for this class was generated from the following file:

- AttributeValue.h

5.32 ArcSec::Attrs Class Reference

```
#include <Request.h>
```

5.32.1 Detailed Description

Attrs is a container for one or more Attr.

Attrs includes includes methonds for inserting, getting items, and counting size as well

The documentation for this class was generated from the following file:

- Request.h

5.33 ArcSec::AuthzRequest Struct Reference

The documentation for this struct was generated from the following file:

- PDP.h

5.34 ArcSec::AuthzRequestSection Struct Reference

```
#include <PDP.h>
```

5.34.1 Detailed Description

These structure are based on the request schema for PDP, so far it can apply to the ArcPDP's request schema, see src/hed/pdc/Request.xsd and src/hed/pdc/Request.xml. It could also apply to the XACMLPDP's request schema, since the difference is minor.

Another approach is, the service composes/marshalls the xml structure directly, then the service should use difference code to compose for ArcPDP's request schema and XACMLPDP's schema, which is not so good.

The documentation for this struct was generated from the following file:

- PDP.h

5.35 Arc::AutoPointer Class Reference

```
#include <Utils.h>
```

Public Member Functions

- AutoPointer (void)
- AutoPointer (T ∗o)
- ∼AutoPointer (void)
- T & operator∗ (void) const
- T ∗ operator-> (void) const
- operator bool (void) const
- bool operator! (void) const
- T ∗ Ptr (void) const
- T ∗ Release (void)

5.35.1 Detailed Description

Wrapper for pointer with automatic destruction.

If ordinary pointer is wrapped in instance of this class it will be automatically destroyed when instance is destroyed. This is useful for maintaing pointers in scope of one function. Only pointers returned by new() are supported.

The documentation for this class was generated from the following file:

- Utils.h

5.36 Arc::CountedPointer::Base Class Reference

The documentation for this class was generated from the following file:

- Utils.h

5.37 Arc::Base64 Class Reference

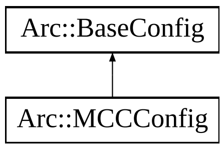
The documentation for this class was generated from the following file:

- Base64.h

5.38 Arc::BaseConfig Class Reference

`#include <ArcConfig.h>`

Inheritance diagram for Arc::BaseConfig:



Public Member Functions

- void AddPluginsPath (const std::string &path)
- void AddPrivateKey (const std::string &path)
- void AddCertificate (const std::string &path)
- void AddProxy (const std::string &path)
- void AddCAFile (const std::string &path)
- void AddCADir (const std::string &path)

- void AddOverlay (XMLNode cfg)
- void GetOverlay (std::string fname)
- virtual XMLNode MakeConfig (XMLNode cfg) const

5.38.1 Detailed Description

Configuration for client interface. It contains information which can't be expressed in class constructor arguments. Most probably common things like software installation location, identity of user, etc.

5.38.2 Member Function Documentation

5.38.2.1 void Arc::BaseConfig::AddCADir (const std::string & *path*)

Add CA directory

5.38.2.2 void Arc::BaseConfig::AddCAFile (const std::string & *path*)

Add CA file

5.38.2.3 void Arc::BaseConfig::AddCertificate (const std::string & *path*)

Add certificate

5.38.2.4 void Arc::BaseConfig::AddOverlay (XMLNode *cfg*)

Add configuration overlay

5.38.2.5 void Arc::BaseConfig::AddPluginsPath (const std::string & *path*)

Adds non-standard location of plugins

5.38.2.6 void Arc::BaseConfig::AddPrivateKey (const std::string & *path*)

Add private key

5.38.2.7 void Arc::BaseConfig::AddProxy (const std::string & *path*)

Add credentials proxy

5.38.2.8 void Arc::BaseConfig::GetOverlay (std::string *fname*)

Read overlay from file

5.38.2.9 virtual **XMLNode** Arc::BaseConfig::MakeConfig (**XMLNode** *cfg*) const [virtual]

Adds configuration part corresponding to stored information into common configuration tree supplied in 'cfg' argument. Returns reference to XML node representing configuration of ModuleManager

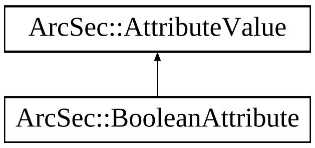
Reimplemented in Arc::MCCConfig.

The documentation for this class was generated from the following file:

- ArcConfig.h

5.39 ArcSec::BooleanAttribute Class Reference

Inheritance diagram for ArcSec::BooleanAttribute:



Public Member Functions

- virtual bool equal (AttributeValue ∗o, bool check_id=true)
- virtual std::string encode ()
- std::string getId ()
- std::string getType ()

5.39.1 Member Function Documentation

5.39.1.1 virtual std::string ArcSec::BooleanAttribute::encode ( ) [inline, virtual]

encode the value in a string format

Implements ArcSec::AttributeValue.

5.39.1.2 virtual bool ArcSec::BooleanAttribute::equal (**AttributeValue** ∗ *value,* bool *check_id* =true) [virtual]

Evluate whether "this" equale to the parameter value

Implements ArcSec::AttributeValue.

5.39.1.3 std::string ArcSec::BooleanAttribute::getId ( ) [inline, virtual]

Get the AttributeId of the <Attribute>

Implements ArcSec::AttributeValue.

5.39.1.4 std::string ArcSec::BooleanAttribute::getType ( ) [inline, virtual]

Get the DataType of the <Attribute>

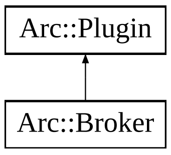
Implements ArcSec::AttributeValue.

The documentation for this class was generated from the following file:

- BooleanAttribute.h

5.40 Arc::Broker Class Reference

Inheritance diagram for Arc::Broker:



Public Member Functions

- const ExecutionTarget ∗ GetBestTarget ()
- void PreFilterTargets (std::list< ExecutionTarget > &targets, const JobDescription &jobdesc, const std::list< URL > &rejectTargets=std::list< URL >())
- void RegisterJobsubmission ()

Protected Member Functions

- virtual void SortTargets ()=0

Protected Attributes

- std::list< ExecutionTarget ∗ > PossibleTargets
- bool TargetSortingDone

5.40.1 Member Function Documentation

5.40.1.1 const ExecutionTarget∗ Arc::Broker::GetBestTarget ( )

Returns next target from the list of ExecutionTarget objects.

When first called this method will sort its list of ExecutionTarget objects, which have been filled by the PreFilterTargets method, and then the first target in the list will be returned.

If this is not the first call then the next target in the list is simply returned.

If there are no targets in the list or the end of the target list have been reached the NULL pointer is returned.

Returns

The pointer to the next ExecutionTarget in the list is returned.

5.40.1.2 void Arc::Broker::PreFilterTargets (std::list< ExecutionTarget > & *targets*, const JobDescription & *jobdesc*, const std::list< URL > & *rejectTargets* = `std::list< URL >()`)

Filter ExecutionTarget objects according to attributes in JobDescription object.

Each of the ExecutionTarget objects in the passed list will be matched against attributes in the passed JobDescription object. For a list of which attributes are considered for matchmaking see appendix B of the libarcclient technical manual (NORDUGRID-TE-CH-20). If a ExecutionTarget object matches the job description, it is added to the internal list of ExecutionTarget objects. NOTE: The list of ExecutionTarget objects must be available through out the scope of this Broker object.

Parameters

targets	A list of ExecutionTarget objects to be considered for addition to the Broker.
jobdesc	JobDescription object holding requirements.
rejectTargets	

5.40.1.3 virtual void Arc::Broker::SortTargets ( ) `[protected, pure virtual]`

Custom Brokers should implement this method.

The task is to sort the PossibleTargets list by "custom" way, for example: FastestQueue-Broker, ExecutionTarget which has the shortest queue lenght will be at the begining of the PossibleTargets list

5.40.2 Field Documentation

5.40.2.1 std::list<ExecutionTarget*> Arc::Broker::PossibleTargets [protected]

This content the Prefilteres ExecutionTargets.

If an Execution Tartget has enought memory, CPU, diskspace, etc. for the actual job requirement than it will be added to the PossibleTargets list

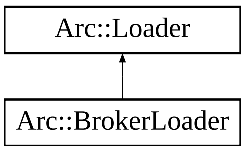
The documentation for this class was generated from the following file:

- Broker.h

5.41 Arc::BrokerLoader Class Reference

`#include <Broker.h>`

Inheritance diagram for Arc::BrokerLoader:



Public Member Functions

- BrokerLoader ()
- ~BrokerLoader ()
- Broker * load (const std::string &name, const UserConfig &usercfg)
- const std::list< Broker * > & GetBrokers () const

5.41.1 Detailed Description

Class responsible for loading Broker plugins The Broker objects returned by a BrokerLoader must not be used after the BrokerLoader goes out of scope.

5.41.2 Constructor & Destructor Documentation

5.41.2.1 Arc::BrokerLoader::BrokerLoader ( )

Constructor Creates a new BrokerLoader.

5.41.2.2 Arc::BrokerLoader::~BrokerLoader ( )

Destructor Calling the destructor destroys all Brokers loaded by the BrokerLoader instance.

5.41.3 Member Function Documentation

5.41.3.1 const std::list<Broker*>& Arc::BrokerLoader::GetBrokers ( ) const [inline]

Retrieve the list of loaded Brokers.

Returns

A reference to the list of Brokers.

5.41.3.2 Broker* Arc::BrokerLoader::load (const std::string & *name*, const UserConfig & *usercfg*)

Load a new Broker

Parameters

name	The name of the Broker to load.
usercfg	The UserConfig object for the new Broker.

Returns

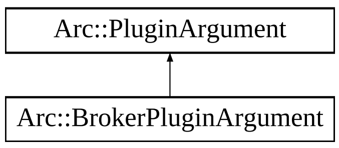
A pointer to the new Broker (NULL on error).

The documentation for this class was generated from the following file:

- Broker.h

5.42 Arc::BrokerPluginArgument Class Reference

Inheritance diagram for Arc::BrokerPluginArgument:



The documentation for this class was generated from the following file:

- Broker.h

5.43 Arc::BrokerTestACCControl Class Reference

The documentation for this class was generated from the following file:

- TestACCControl.h

5.44 DataStaging::Processor::BulkThreadArgument Class Reference

5.44.1 Detailed Description

Class used to pass information to spawned thread (for bulk operations)

The documentation for this class was generated from the following file:

- Processor.h

5.45 DataStaging::CacheParameters Class Reference

```
#include <DTR.h>
```

Public Member Functions

- CacheParameters (void)
- CacheParameters (std::vector< std::string > caches, std::vector< std::string > remote_caches, std::vector< std::string > drain_caches)

Data Fields

- std::vector< std::string > cache_dirs
- std::vector< std::string > remote_cache_dirs
- std::vector< std::string > drain_cache_dirs

5.45.1 Detailed Description

The configured cache directories.

The documentation for this class was generated from the following file:

- DTR.h

5.46 ArcCredential::cert_verify_context Struct Reference

The documentation for this struct was generated from the following file:

- CertUtil.h

5.47 Arc::CertEnvLocker Class Reference

The documentation for this class was generated from the following file:

- UserConfig.h

5.48 Arc::ChainContext Class Reference

```
#include <MCCLoader.h>
```

Public Member Functions

- operator PluginsFactory ∗ ()

5.48.1 Detailed Description

Interface to chain specific functionality.

Object of this class is associated with every MCCLoader object. It is accessible for -MCC and Service components and provides an interface to manipulate chains stored in Loader. This makes it possible to modify chains dynamically - like deploying new services on demand.

5.48.2 Member Function Documentation

5.48.2.1 Arc::ChainContext::operator **PluginsFactory** ∗ ( ) `[inline]`

Returns associated PluginsFactory object

References Arc::Loader::factory_.

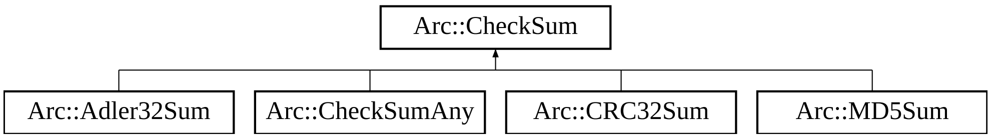
The documentation for this class was generated from the following file:

- MCCLoader.h

5.49 Arc::CheckSum Class Reference

```
#include <CheckSum.h>
```

Inheritance diagram for Arc::CheckSum:



Public Member Functions

- CheckSum (void)
- virtual void start (void)=0
- virtual void add (void ∗buf, unsigned long long int len)=0
- virtual void end (void)=0
- virtual void result (unsigned char ∗&res, unsigned int &len) const =0
- virtual int print (char ∗buf, int len) const
- virtual void scan (const char ∗buf)=0
- virtual operator bool (void) const
- virtual bool operator! (void) const

5.49.1 Detailed Description

Interface for checksum manipulations.

This class is an interface and is extended in the specialized classes CRC32Sum, MD5Sum and Adler32Sum. The interface is among others used during data transfers through DataBuffer class

See also

CRC32Sum
MD5Sum
Adler32Sum

5.49.2 Member Function Documentation

5.49.2.1 virtual void Arc::CheckSum::add (void ∗ *buf*, unsigned long long int *len*) [pure virtual]

Add data to be checksummed.

This method calculates the checksum of the passed data chuck, taking into account the previous state of this object.

Parameters

buf	pointer to data chuck to be checksummed.
len	size of the data chuck.

Implemented in Arc::CheckSumAny, Arc::Adler32Sum, Arc::MD5Sum, and Arc::CRC32Sum.

Referenced by Arc::CheckSumAny::add().

5.49.2.2 virtual void Arc::CheckSum::end (void) [pure virtual]

Finalize the checksumming.

This method finalizes the checksum algorithm, that is calculating the final checksum result.

Implemented in Arc::CheckSumAny, Arc::Adler32Sum, Arc::MD5Sum, and Arc::CRC32Sum.

Referenced by Arc::CheckSumAny::end().

5.49.2.3 virtual int Arc::CheckSum::print (char ∗ *buf,* int *len*) const [inline, virtual]

Retrieve result of checksum into a string.

The passed string buf is filled with result of checksum algorithm in base 16. At most len chacters is filled into buffer buf. The hexadecimal value is prepended with "<algorithm>:", where <algorithm> is one of "cksum", "md5" or "adler32" respectively corresponding to the result from the CRC32Sum, MD5Sum and Adler32 classes.

Parameters

buf	pointer to buffer which should be filled with checksum result.
len	max number of character filled into buffer.

Reimplemented in Arc::CheckSumAny, Arc::Adler32Sum, Arc::MD5Sum, and Arc::CRC32Sum.

Referenced by Arc::CheckSumAny::print().

5.49.2.4 virtual void Arc::CheckSum::scan (const char ∗ *buf*) [pure virtual]

Set internal checksum state.

This method sets the internal state to that of the passed textural representation. The format passed to this method must be the same as retrieved from the CheckSum::print method.

Parameters

buf	string containing textural representation of checksum

See also

CheckSum::print

Implemented in Arc::CheckSumAny, Arc::Adler32Sum, Arc::MD5Sum, and Arc::CR-C32Sum.

Referenced by Arc::CheckSumAny::scan().

5.49.2.5 virtual void Arc::CheckSum::start (void) [pure virtual]

Initiate the checksum algorithm.

This method must be called before starting a new checksum calculation.

Implemented in Arc::CheckSumAny, Arc::Adler32Sum, Arc::MD5Sum, and Arc::CR-C32Sum.

Referenced by Arc::CheckSumAny::start().

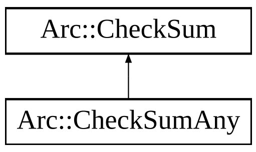
The documentation for this class was generated from the following file:

- CheckSum.h

5.50 Arc::CheckSumAny Class Reference

```
#include <CheckSum.h>
```

Inheritance diagram for Arc::CheckSumAny:



Public Member Functions

- virtual void start (void)
- virtual void add (void ∗buf, unsigned long long int len)
- virtual void end (void)
- virtual void result (unsigned char ∗&res, unsigned int &len) const
- virtual int print (char ∗buf, int len) const
- virtual void scan (const char ∗buf)
- virtual operator bool (void) const
- virtual bool operator! (void) const

Static Public Member Functions

- static std::string FileChecksum (const std::string &filepath, type tp=md5, bool decimalbase=false)

5.50.1 Detailed Description

Wrapper for CheckSum class.

To be used for manipulation of any supported checksum type in a transparent way.

5.50.2 Member Function Documentation

5.50.2.1 virtual void Arc::CheckSumAny::add (void ∗ *buf,* unsigned long long int *len*) `[inline, virtual]`

Add data to be checksummed.

This method calculates the checksum of the passed data chuck, taking into account the previous state of this object.

Parameters

buf	pointer to data chuck to be checksummed.
len	size of the data chuck.

Implements Arc::CheckSum.

References Arc::CheckSum::add().

5.50.2.2 virtual void Arc::CheckSumAny::end (void) `[inline, virtual]`

Finalize the checksumming.

This method finalizes the checksum algorithm, that is calculating the final checksum result.

Implements Arc::CheckSum.

References Arc::CheckSum::end().

5.50.2.3 static std::string Arc::CheckSumAny::FileChecksum (const std::string & *filepath,* type *tp* = `md5`, bool *decimalbase* = `false`) `[static]`

Get checksum of a file.

This method provide an easy way to get the checksum of a file, by only specifying the path to the file. Optionally the checksum type can be specified, if not the MD5 algorithm will be used.

Parameters

filepath	path to file of which checksum should be calculated
tp	type of checksum algorithm to use, default is md5.
decimalbase	specifies whether output should be in base 10 or 16

Returns

a string containing the calculated checksum is returned.

5.50.2.4 virtual int Arc::CheckSumAny::print (char * *buf*, int *len*) const [inline, virtual]

Retrieve result of checksum into a string.

The passed string buf is filled with result of checksum algorithm in base 16. At most len chacters is filled into buffer buf. The hexadecimal value is prepended with "<algorithm>:", where <algorithm> is one of "cksum", "md5" or "adler32" respectively corresponding to the result from the CRC32Sum, MD5Sum and Adler32 classes.

Parameters

buf	pointer to buffer which should be filled with checksum result.
len	max number of character filled into buffer.

Reimplemented from Arc::CheckSum.

References Arc::CheckSum::print().

5.50.2.5 virtual void Arc::CheckSumAny::scan (const char * *buf*) [inline, virtual]

Set internal checksum state.

This method sets the internal state to that of the passed textural representation. The format passed to this method must be the same as retrieved from the CheckSum::print method.

Parameters

buf	string containing textural representation of checksum

See also

CheckSum::print

Implements Arc::CheckSum.

References Arc::CheckSum::scan().

5.50.2.6 virtual void Arc::CheckSumAny::start (void) `[inline, virtual]`

Initiate the checksum algorithm.

This method must be called before starting a new checksum calculation.

Implements Arc::CheckSum.

References Arc::CheckSum::start().

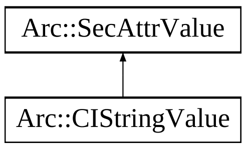
The documentation for this class was generated from the following file:

- CheckSum.h

5.51 Arc::CIStringValue Class Reference

`#include <CIStringValue.h>`

Inheritance diagram for Arc::CIStringValue:



Public Member Functions

- CIStringValue ()
- CIStringValue (const char *ss)
- CIStringValue (const std::string &ss)
- virtual operator bool ()

Protected Member Functions

- virtual bool equal (SecAttrValue &b)

5.51.1 Detailed Description

This class implements case insensitive strings as security attributes.

This is an example of how to inherit SecAttrValue. The class is meant to implement security attributes that are case insensitive strings.

5.51.2 Constructor & Destructor Documentation

5.51.2.1 Arc::CIStringValue::CIStringValue ( )

Default constructor

5.51.2.2 Arc::CIStringValue::CIStringValue (const char ∗ *ss*)

This is a constructor that takes a string litteral.

5.51.2.3 Arc::CIStringValue::CIStringValue (const std::string & *ss*)

This is a constructor that takes a string object.

5.51.3 Member Function Documentation

5.51.3.1 virtual bool Arc::CIStringValue::equal (SecAttrValue & *b*) [protected, virtual]

This function returns true if two strings are the same apart from letter case

Reimplemented from Arc::SecAttrValue.

5.51.3.2 virtual Arc::CIStringValue::operator bool ( ) [virtual]

This function returns false if the string is empty or uninitialized

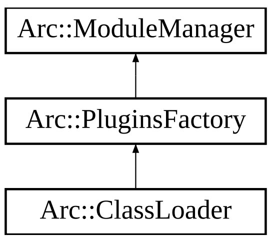
Reimplemented from Arc::SecAttrValue.

The documentation for this class was generated from the following file:

- CIStringValue.h

5.52 Arc::ClassLoader Class Reference

Inheritance diagram for Arc::ClassLoader:

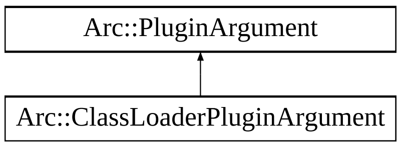


The documentation for this class was generated from the following file:

- ClassLoader.h

5.53 Arc::ClassLoaderPluginArgument Class Reference

Inheritance diagram for Arc::ClassLoaderPluginArgument:



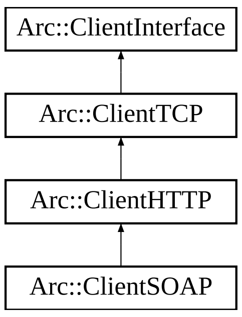
The documentation for this class was generated from the following file:

- ClassLoader.h

5.54 Arc::ClientHTTP Class Reference

```
#include <ClientInterface.h>
```

Inheritance diagram for Arc::ClientHTTP:



5.54.1 Detailed Description

Class for setting up a MCC chain for HTTP communication.

The ClientHTTP class inherits from the ClientTCP class and adds an HTTP MCC to the chain.

The documentation for this class was generated from the following file:

- ClientInterface.h

5.55 Arc::ClientHTTPwithSAML2SSO Class Reference

Public Member Functions

- ClientHTTPwithSAML2SSO ()
- MCC_Status process (const std::string &method, PayloadRawInterface ∗request, HTTPClientInfo ∗info, PayloadRawInterface ∗∗response, const std::string &idp-_name, const std::string &username, const std::string &password, const bool reuse_authn=false)

5.55.1 Constructor & Destructor Documentation

5.55.1.1 Arc::ClientHTTPwithSAML2SSO::ClientHTTPwithSAML2SSO ( ) `[inline]`

Constructor creates MCC chain and connects to server.

5.55.2 Member Function Documentation

5.55.2.1 MCC_Status Arc::ClientHTTPwithSAML2SSO::process (const std::string & *method*, PayloadRawInterface ∗ *request*, HTTPClientInfo ∗ *info*, PayloadRawInterface ∗∗ *response*, const std::string & *idp_name*, const std::string & *username*, const std::string & *password*, const bool *reuse_authn* = `false`)

Send HTTP request and receive response.

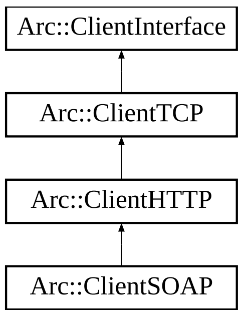
The documentation for this class was generated from the following file:

- ClientSAML2SSO.h

5.56 Arc::ClientInterface Class Reference

`#include <ClientInterface.h>`

Inheritance diagram for Arc::ClientInterface:



5.56.1 Detailed Description

Utility base class for MCC.

The ClientInterface class is a utility base class used for configuring a client side - Message Chain Component (MCC) chain and loading it into memory. It has several specializations of increasing complexity of the MCC chains.

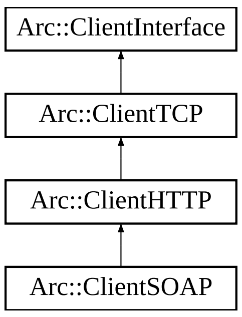
The documentation for this class was generated from the following file:

- ClientInterface.h

5.57 Arc::ClientSOAP Class Reference

```
#include <ClientInterface.h>
```

Inheritance diagram for Arc::ClientSOAP:



Public Member Functions

- ClientSOAP ()
- MCC_Status process (PayloadSOAP ∗request, PayloadSOAP ∗∗response)
- MCC_Status process (const std::string &action, PayloadSOAP ∗request, - PayloadSOAP ∗∗response)
- MCC ∗ GetEntry ()
- void AddSecHandler (XMLNode handlercfg, const std::string &libanme="", const std::string &libpath="")
- virtual bool Load ()

5.57.1 Detailed Description

Class with easy interface for sending/receiving SOAP messages over HTTP(S/G). It takes care of configuring MCC chain and making an entry point.

5.57.2 Constructor & Destructor Documentation

5.57.2.1 Arc::ClientSOAP::ClientSOAP ( ) [inline]

Constructor creates MCC chain and connects to server.

5.57.3 Member Function Documentation

5.57.3.1 void Arc::ClientSOAP::AddSecHandler (XMLNode *handlercfg*, const std::string & *libanme* = "", const std::string & *libpath* = "")

Adds security handler to configuration of SOAP MCC

Reimplemented from Arc::ClientHTTP.

5.57.3.2 MCC∗ Arc::ClientSOAP::GetEntry ( ) [inline]

Returns entry point to SOAP MCC in configured chain. To initialize entry point Load() method must be called.

Reimplemented from Arc::ClientHTTP.

5.57.3.3 virtual bool Arc::ClientSOAP::Load ( ) [virtual]

Instantiates pluggable elements according to generated configuration

Reimplemented from Arc::ClientHTTP.

5.57.3.4 MCC_Status Arc::ClientSOAP::process (PayloadSOAP ∗ *request*, PayloadSOAP ∗∗ *response*)

Send SOAP request and receive response.

5.57.3.5 MCC_Status Arc::ClientSOAP::process (const std::string & *action*, PayloadSOAP ∗ *request*, PayloadSOAP ∗∗ *response*)

Send SOAP request with specified SOAP action and receive response.

The documentation for this class was generated from the following file:

- ClientInterface.h

5.58 Arc::ClientSOAPwithSAML2SSO Class Reference

Public Member Functions

- ClientSOAPwithSAML2SSO ()
- MCC_Status process (PayloadSOAP ∗request, PayloadSOAP ∗∗response, const std::string &idp_name, const std::string &username, const std::string &password, const bool reuse_authn=false)
- MCC_Status process (const std::string &action, PayloadSOAP ∗request, -PayloadSOAP ∗∗response, const std::string &idp_name, const std::string &username, const std::string &password, const bool reuse_authn=false)

5.58.1 Constructor & Destructor Documentation

5.58.1.1 Arc::ClientSOAPwithSAML2SSO::ClientSOAPwithSAML2SSO ( ) `[inline]`

Constructor creates MCC chain and connects to server.

5.58.2 Member Function Documentation

5.58.2.1 MCC_Status Arc::ClientSOAPwithSAML2SSO::process (PayloadSOAP ∗ *request*, PayloadSOAP ∗∗ *response*, const std::string & *idp_name*, const std::string & *username*, const std::string & *password*, const bool *reuse_authn* = `false`)

Send SOAP request and receive response.

5.58.2.2 MCC_Status Arc::ClientSOAPwithSAML2SSO::process (const std::string & *action*, PayloadSOAP ∗ *request*, PayloadSOAP ∗∗ *response*, const std::string & *idp_name*, const std::string & *username*, const std::string & *password*, const bool *reuse_authn* = `false`)

Send SOAP request with specified SOAP action and receive response.

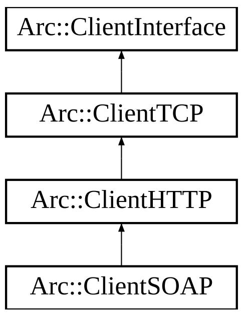
The documentation for this class was generated from the following file:

- ClientSAML2SSO.h

5.59 Arc::ClientTCP Class Reference

```
#include <ClientInterface.h>
```

Inheritance diagram for Arc::ClientTCP:



5.59.1 Detailed Description

Class for setting up a MCC chain for TCP communication.

The ClientTCP class is a specialization of the ClientInterface which sets up a client MCC chain for TCP communication, and optionally with a security layer on top which can be either TLS, GSI or SSL3.

The documentation for this class was generated from the following file:

- ClientInterface.h

5.60 Arc::ClientX509Delegation Class Reference

Public Member Functions

- ClientX509Delegation ()
- bool createDelegation (DelegationType deleg, std::string &delegation_id)
- bool acquireDelegation (DelegationType deleg, std::string &delegation_cred, std::string &delegation_id, const std::string cred_identity="", const std::string cred_delegator_ip="", const std::string username="", const std::string password="")

5.60.1 Constructor & Destructor Documentation

5.60.1.1 Arc::ClientX509Delegation::ClientX509Delegation ( ) `[inline]`

Constructor creates MCC chain and connects to server.

5.60.2 Member Function Documentation

5.60.2.1 bool Arc::ClientX509Delegation::acquireDelegation (DelegationType *deleg*, std::string & *delegation_cred*, std::string & *delegation_id*, const std::string *cred_identity* = "", const std::string *cred_delegator_ip* = "", const std::string *username* = "", const std::string *password* = "")

Acquire delegation credential from delegation service. This method should be called by intermediate service ('n+1' service as explained on above) in order to use this delegation credential on behalf of the EEC's holder.

Parameters

deleg	Delegation type
delegation_-id	delegation ID which is used to look up the credential by delegation service
cred_identity	the identity (in case of x509 credential, it is the DN of EEC credential).
cred_-delegator_ip	the IP address of the credential delegator. Regard of delegation, an intermediate service should accomplish three tasks: 1. Acquire 'n' level delegation credential (which is delegated by 'n-1' level delegator) from delegation service; 1. Create 'n+1' level delegation credential to delegation service; 2. Use 'n' level delegation credential to act on behalf of the EEC's holder. In case of absense of delegation_id, the 'n-1' level delegator's IP address and credential's identity are supposed to be used for look up the delegation credential from delegation service.

5.60.2.2 bool Arc::ClientX509Delegation::createDelegation (DelegationType *deleg*, std::string & *delegation_id*)

Create the delegation credential according to the different remote delegation service. This method should be called by holder of EEC(end entity credential) which would delegate its EEC credential, or by holder of delegated credential(normally, the holder is intermediate service) which would further delegate the credential (on behalf of the original EEC's holder) (for instance, the 'n' intermediate service creates a delegation credential, then the 'n+1' intermediate service aquires this delegation credential from the delegation service and also acts on behalf of the EEC's holder by using this delegation credential).

Parameters

deleg	Delegation type
delegation_-id	For gridsite delegation service, the delegation_id is supposed to be created by client side, and sent to service side; for ARC delegation service, the delegation_id is supposed to be created by service side, and returned back. So for gridsite delegation service, this parameter is treated as input, while for ARC delegation service, it is treated as output.

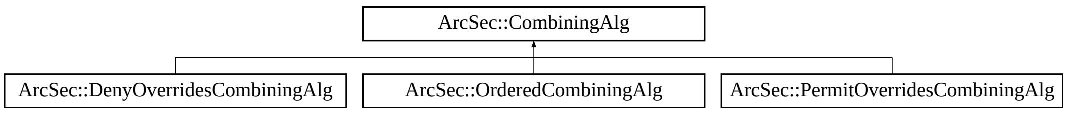
The documentation for this class was generated from the following file:

- ClientX509Delegation.h

5.61 ArcSec::CombiningAlg Class Reference

`#include <CombiningAlg.h>`

Inheritance diagram for ArcSec::CombiningAlg:


ArcSec::CombiningAlg
ArcSec::DenyOverridesCombiningAlg
ArcSec::OrderedCombiningAlg
ArcSec::PermitOverridesCombiningAlg

Public Member Functions

- virtual Result combine (EvaluationCtx ∗ctx, std::list< Policy ∗ > policies)=0
- virtual const std::string & getalgId (void) const =0

5.61.1 Detailed Description

Interface for combining algrithm.

This class is used to implement a specific combining algorithm for combining policies.

5.61.2 Member Function Documentation

5.61.2.1 virtual Result ArcSec::CombiningAlg::combine (**EvaluationCtx** ∗ *ctx*, std::list< **Policy** ∗ > *policies*) `[pure virtual]`

Evaluate request against policy, and if there are more than one policies, combine the evaluation results according to the combing algorithm implemented inside in the method combine(ctx, policies) itself.

Parameters

ctx	The information about request is included
policies	The "match" and "eval" method inside each policy will be called, and then those results from each policy will be combined according to the combining algorithm inside CombingAlg class.

Implemented in ArcSec::PermitOverridesCombiningAlg, and ArcSec::DenyOverrides-CombiningAlg.

5.61.2.2 virtual const std::string& ArcSec::CombiningAlg::getalgId (void) const `[pure virtual]`

Get the identifier of the combining algorithm class

Returns

The identity of the algorithm

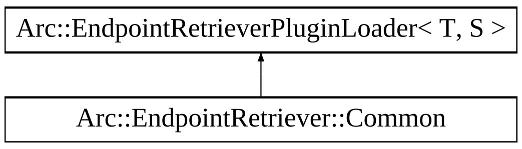
Implemented in ArcSec::PermitOverridesCombiningAlg, and ArcSec::DenyOverrides-CombiningAlg.

The documentation for this class was generated from the following file:

- CombiningAlg.h

5.62 Arc::EndpointRetriever::Common Class Reference

Inheritance diagram for Arc::EndpointRetriever::Common:

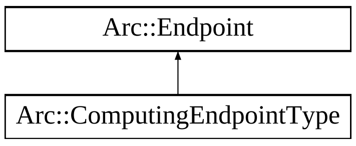

Arc::EndpointRetrieverPluginLoader< T, S >
Arc::EndpointRetriever::Common

The documentation for this class was generated from the following file:

- EndpointRetriever.h

5.63 Arc::ComputingEndpointType Class Reference

Inheritance diagram for Arc::ComputingEndpointType:

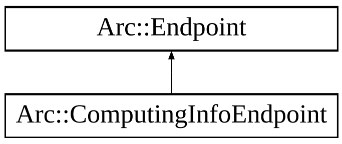


The documentation for this class was generated from the following file:

- ExecutionTarget.h

5.64 Arc::ComputingInfoEndpoint Class Reference

Inheritance diagram for Arc::ComputingInfoEndpoint:



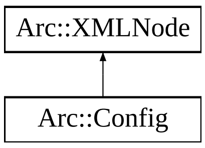
The documentation for this class was generated from the following file:

- Endpoint.h

5.65 Arc::Config Class Reference

```
#include <ArcConfig.h>
```

Inheritance diagram for Arc::Config:



Public Member Functions

- Config ()
- Config (const char ∗filename)
- Config (const std::string &xml_str)
- Config (XMLNode xml)
- Config (long cfg_ptr_addr)
- Config (const Config &cfg)
- void print (void)
- bool parse (const char ∗filename)
- const std::string & getFileName (void) const
- void setFileName (const std::string &filename)
- void save (const char ∗filename)

5.65.1 Detailed Description

Configuration element - represents (sub)tree of ARC configuration.

This class is intended to be used to pass configuration details to various parts of HED and external modules. Currently it's just a wrapper over XML tree. But than may change in a future, although interface should be preserved. Currently it is capable of loading XML configuration document from file. In future it will be capable of loading more user-readable format and process it into tree-like structure convenient for machine processing (XML-like). So far there are no schema and/or namespaces assigned.

5.65.2 Constructor & Destructor Documentation

5.65.2.1 Arc::Config::Config ( ) [inline]

Creates empty XML tree

5.65.2.2 Arc::Config::Config (const char * *filename*)

Loads configuration document from file 'filename'

5.65.2.3 Arc::Config::Config (const std::string & *xml_str*) [inline]

Parse configuration document from memory

5.65.2.4 Arc::Config::Config (XMLNode *xml*) [inline]

Acquire existing XML (sub)tree. Content is not copied. Make sure XML tree is not destroyed while in use by this object.

5.65.2.5 Arc::Config::Config (long *cfg_ptr_addr*)

Copy constructor used by language bindings

5.65.2.6 Arc::Config::Config (const Config & *cfg*)

Copy constructor used by language bindings

5.65.3 Member Function Documentation

5.65.3.1 const std::string& Arc::Config::getFileName (void) const [inline]

Gives back file name of config file or empty string if it was generared from the XMLNode subtree

5.65.3.2 bool Arc::Config::parse (const char * *filename*)

Parse configuration document from file 'filename'

5.65.3.3 void Arc::Config::print (void)

Print structure of document. For debuging purposes. Printed content is not an XML document.

5.65.3.4 void Arc::Config::save (const char * *filename*)

Save to file

5.65.3.5 void Arc::Config::setFileName (const std::string & *filename*) `[inline]`

Set the file name of config file

The documentation for this class was generated from the following file:

- ArcConfig.h

5.66 Arc::ConfigEndpoint Class Reference

The documentation for this class was generated from the following file:

- UserConfig.h

5.67 Arc::ConfusaCertHandler Class Reference

```
#include <ConfusaCertHandler.h>
```

Public Member Functions

- ConfusaCertHandler (int keysize, const std::string dn)
- std::string getCertRequestB64 ()
- bool createCertRequest (std::string password="", std::string storedir="./")

5.67.1 Detailed Description

Wrapper around Credential handling the Confusa specifics.

5.67.2 Constructor & Destructor Documentation

5.67.2.1 Arc::ConfusaCertHandler::ConfusaCertHandler (int *keysize,* const std::string *dn*)

Create a new ConfusaCertHandler for DN dn and given keysize Basically Confusa cert handler wraps around Credential

5.67.3 Member Function Documentation

5.67.3.1 bool Arc::ConfusaCertHandler::createCertRequest (std::string *password* = "", std::string *storedir* = "./")

Create a new end entity certificate, with a private key encrypted with password password. Private key and certificate will be stored in directory storedir.

5.67.3.2 std::string Arc::ConfusaCertHandler::getCertRequestB64 ( )

Get the certificate request managed by this confusa cert handler in base 64 encoding

The documentation for this class was generated from the following file:

- ConfusaCertHandler.h

5.68 Arc::ConfusaParserUtils Class Reference

```
#include <ConfusaParserUtils.h>
```

Static Public Member Functions

- static std::string urlencode (const std::string url)
- static std::string urlencode_params (const std::string url)
- static xmlDocPtr get_doc (const std::string xml_file)
- static void destroy_doc (xmlDocPtr doc)
- static std::string extract_body_information (const std::string html_string)
- static std::string handle_redirect_step (Arc::MCCConfig cfg, const std::string remote_url, std::string ∗cookies=NULL, std::multimap< std::string, std::string > ∗httpAttributes=NULL)
- static std::string evaluate_path (xmlDocPtr doc, const std::string xpathExpr, std::list< std::string > ∗contentList=NULL)

5.68.1 Detailed Description

Methods often needed in evaluation web pages from the Confusa WebSSO workflow

5.68.2 Member Function Documentation

5.68.2.1 static void Arc::ConfusaParserUtils::destroy_doc (xmlDocPtr *doc*) [static]

Destroy a libxml2 doc representation

5.68.2.2 static std::string Arc::ConfusaParserUtils::evaluate_path (xmlDocPtr *doc*, const std::string *xpathExpr*, std::list< std::string > ∗ *contentList* = NULL) [static]

Evaluate the given xPathExpr on the document ptr. Return a string with the FIRST result if contentList is NULL. Return a string with the first result and all results, including the first one, in contentList if contentList is not null.

5.68.2.3 static std::string Arc::ConfusaParserUtils::extract_body_information (const std::string *html_string*) [static]

Get the part only within <body> and </body> in a HTML string For parsing, usually only this part is interesting.

5.68.2.4 static xmlDocPtr Arc::ConfusaParserUtils::get_doc (const std::string *xml_file*) [static]

Construct a lixml2 doc representation from the xml file

5.68.2.5 static std::string Arc::ConfusaParserUtils::handle_redirect_step (Arc::MCCConfig *cfg*, const std::string *remote_url*, std::string ∗ *cookies* = NULL, std::multimap< std::string, std::string > ∗ *httpAttributes* = NULL) [static]

Handle a single redirect step from the SAML2 WebSSO profile. Store the received cookie in ∗cookie and pass the given httpAttributes to the site during redirect.

5.68.2.6 static std::string Arc::ConfusaParserUtils::urlencode (const std::string *url*) [static]

urlencode the passed string

5.68.2.7 static std::string Arc::ConfusaParserUtils::urlencode_params (const std::string *url*) [static]

Urlencode the passed string with respect to the parameters. The difference to urlencode is that the parameters will keep their seperators, i.e. the ? and & separating parameters will be preserved.

The documentation for this class was generated from the following file:

- ConfusaParserUtils.h

5.69 Arc::CountedPointer Class Reference

```
#include <Utils.h>
```

Data Structures

- class Base

Public Member Functions

- T & operator$*$ (void) const
- T $*$ operator-$>$ (void) const
- operator bool (void) const
- bool operator! (void) const
- bool operator== (const CountedPointer &p) const
- bool operator!= (const CountedPointer &p) const
- bool operator$<$ (const CountedPointer &p) const
- T $*$ Ptr (void) const
- T $*$ Release (void)

5.69.1 Detailed Description

Wrapper for pointer with automatic destruction and mutiple references.

If ordinary pointer is wrapped in instance of this class it will be automatically destroyed when all instances refering to it are destroyed. This is useful for maintaing pointers refered from multiple structures wihth automatic destruction of original object when last reference is destroyed. It is similar to Java approach with a difference that desctruction time is strictly defined. Only pointers returned by new() are supported. This class is not thread-safe

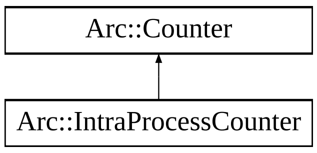
The documentation for this class was generated from the following file:

- Utils.h

5.70 Arc::Counter Class Reference

`#include <Counter.h>`

Inheritance diagram for Arc::Counter:



Public Member Functions

- virtual ∼Counter ()
- virtual int getLimit ()=0
- virtual int setLimit (int newLimit)=0
- virtual int changeLimit (int amount)=0
- virtual int getExcess ()=0
- virtual int setExcess (int newExcess)=0
- virtual int changeExcess (int amount)=0
- virtual int getValue ()=0
- virtual CounterTicket reserve (int amount=1, Glib::TimeVal duration=ETERNAL, bool prioritized=false, Glib::TimeVal timeOut=ETERNAL)=0

Protected Types

- typedef unsigned long long int IDType

Protected Member Functions

- Counter ()
- virtual void cancel (IDType reservationID)=0
- virtual void extend (IDType &reservationID, Glib::TimeVal &expiryTime, Glib::-TimeVal duration=ETERNAL)=0
- Glib::TimeVal getCurrentTime ()
- Glib::TimeVal getExpiryTime (Glib::TimeVal duration)
- CounterTicket getCounterTicket (Counter::IDType reservationID, Glib::TimeVal expiryTime, Counter ∗counter)
- ExpirationReminder getExpirationReminder (Glib::TimeVal expTime, Counter::I-DType resID)

Friends

- class CounterTicket
- class ExpirationReminder

5.70.1 Detailed Description

A class defining a common interface for counters.

This class defines a common interface for counters as well as some common functionality.

The purpose of a counter is to provide housekeeping some resource such as e.g. disk space, memory or network bandwidth. The counter itself will not be aware of what kind of resource it limits the use of. Neither will it be aware of what unit is being used to measure that resource. Counters are thus very similar to semaphores. Furthermore, counters are designed to handle concurrent operations from multiple threads/processes in a consistent manner.

Every counter has a limit, an excess limit and a value. The limit is a number that specify how many units are available for reservation. The value is the number of units that are currently available for reservation, i.e. has not allready been reserved. The excess limit specify how many extra units can be reserved for high priority needs even if there are no normal units available for reservation. The excess limit is similar to the credit limit of e.g. a VISA card.

The users of the resource must thus first call the counter in order to make a reservation of an appropriate amount of the resource, then allocate and use the resource and finally call the counter again to cancel the reservation.

Typical usage is:

```
// Declare a counter. Replace XYZ by some appropriate kind of
// counter and provide required parameters. Unit is MB.
XYZCounter memory(...);
...
// Make a reservation of memory for 2000000 doubles.
CounterTicket tick = memory.reserve(2*sizeof(double));
// Use the memory.
double* A=new double[2000000];
doSomething(A);
delete[] A;
// Cancel the reservation.
tick.cancel();
```

There are also alternative ways to make reservations, including self-expiring reservations, prioritized reservations and reservations that fail if they cannot be made fast enough.

For self expiring reservations, a duration is provided in the reserve call:

```
tick = memory.reserve(2*sizeof(double), Glib::TimeVal(1,0));
```

A self-expiring reservation can be cancelled explicitly before it expires, but if it is not cancelled it will expire automatically when the duration has passed. The default value for the duration is ETERNAL, which means that the reservation will not be cancelled automatically.

Prioritized reservations may use the excess limit and succeed immediately even if there are no normal units available for reservation. The value of the counter will in this case become negative. A prioritized reservation looks like this:

```
tick = memory.reserve(2*sizeof(double), Glib::TimeVal(1,0), true);
```

Finally, a time out option can be provided for a reservation. If some task should be performed within two seconds or not at all, the reservation can look like this:

```
tick = memory.reserve(2*sizeof(double), Glib::TimeVal(1,0),
                      true, Glib::TimeVal(2,0));
if (tick.isValid())
 doSomething(...);
```

5.70.2 Member Typedef Documentation

5.70.2.1 typedef unsigned long long int **Arc::Counter::IDType** `[protected]`

A typedef of identification numbers for reservation.

This is a type that is used as identification numbesrs (keys) for referencing of reservations. It is used internally in counters for book keeping of reservations as well as in the CounterTicket class in order to be able to cancel and extend reservations.

5.70.3 Constructor & Destructor Documentation

5.70.3.1 Arc::Counter::Counter ( ) `[protected]`

Default constructor.

This is the default constructor. Since Counter is an abstract class, it should only be used by subclasses. Therefore it is protected. Furthermore, since the Counter class has no attributes, nothing needs to be initialized and thus this constructor is empty.

5.70.3.2 virtual Arc::Counter::∼Counter ( ) `[virtual]`

The destructor.

This is the destructor of the Counter class. Since the Counter class has no attributes, nothing needs to be cleaned up and thus the destructor is empty.

5.70.4 Member Function Documentation

5.70.4.1 virtual void Arc::Counter::cancel (**IDType** *reservationID*) `[protected, pure virtual]`

Cancellation of a reservation.

This method cancels a reservation. It is called by the CounterTicket that corresponds to the reservation.

Parameters

reservationID	The identity number (key) of the reservation to cancel.

Implemented in Arc::IntraProcessCounter.

5.70.4.2 virtual int Arc::Counter::changeExcess (int *amount*) `[pure virtual]`

Changes the excess limit of the counter.

Changes the excess limit of the counter by adding a certain amount to the current excess limit.

Parameters

amount	The amount by which to change the excess limit.

Returns

The new excess limit.

Implemented in Arc::IntraProcessCounter.

5.70.4.3 virtual int Arc::Counter::changeLimit (int *amount*) `[pure virtual]`

Changes the limit of the counter.

Changes the limit of the counter by adding a certain amount to the current limit.

Parameters

amount	The amount by which to change the limit.

Returns

The new limit.

Implemented in Arc::IntraProcessCounter.

5.70.4.4 virtual void Arc::Counter::extend (IDType & *reservationID*, Glib::TimeVal & *expiryTime*, Glib::TimeVal *duration* = ETERNAL) `[protected, pure virtual]`

Extension of a reservation.

This method extends a reservation. It is called by the CounterTicket that corresponds to the reservation.

Parameters

reservationI-D	Used for input as well as output. Contains the identification number of the original reservation on entry and the new identification number of the extended reservation on exit.
expiryTime	Used for input as well as output. Contains the expiry time of the original reservation on entry and the new expiry time of the extended reservation on exit.
duration	The time by which to extend the reservation. The new expiration time is computed based on the current time, NOT the previous expiration time.

Implemented in Arc::IntraProcessCounter.

5.70.4.5 CounterTicket Arc::Counter::getCounterTicket (Counter::IDType *reservationID,* Glib::TimeVal *expiryTime,* Counter ∗ *counter*) [protected]

A "relay method" for a constructor of the CounterTicket class.

This method acts as a relay for one of the constructors of the CounterTicket class. - That constructor is private, but needs to be accessible from the subclasses of Counter (bot not from anywhere else). In order not to have to declare every possible subclass of Counter as a friend of CounterTicket, only the base class Counter is a friend and its subclasses access the constructor through this method. (If C++ had supported "package access", as Java does, this trick would not have been necessary.)

Parameters

reservationI-D	The identity number of the reservation corresponding to the Counter-Ticket.
expiryTime	the expiry time of the reservation corresponding to the CounterTicket.
counter	The Counter from which the reservation has been made.

Returns

The counter ticket that has been created.

5.70.4.6 Glib::TimeVal Arc::Counter::getCurrentTime ( ) [protected]

Get the current time.

Returns the current time. An "adapter method" for the assign_current_time() method in the Glib::TimeVal class. return The current time.

5.70.4.7 virtual int Arc::Counter::getExcess ( ) [pure virtual]

Returns the excess limit of the counter.

Returns the excess limit of the counter, i.e. by how much the usual limit may be exceeded by prioritized reservations.

Returns

The excess limit.

Implemented in Arc::IntraProcessCounter.

5.70.4.8 ExpirationReminder Arc::Counter::getExpirationReminder (Glib::TimeVal *expTime,* Counter::IDType *resID*) [protected]

A "relay method" for the constructor of ExpirationReminder.

This method acts as a relay for one of the constructors of the ExpirationReminder class. That constructor is private, but needs to be accessible from the subclasses of Counter (bot not from anywhere else). In order not to have to declare every possible subclass of Counter as a friend of ExpirationReminder, only the base class Counter is a friend and its subclasses access the constructor through this method. (If C++ had supported "package access", as Java does, this trick would not have been necessary.)

Parameters

expTime	the expiry time of the reservation corresponding to the Expiration-Reminder.
resID	The identity number of the reservation corresponding to the Expiration-Reminder.

Returns

The ExpirationReminder that has been created.

5.70.4.9 Glib::TimeVal Arc::Counter::getExpiryTime (Glib::TimeVal *duration*) `[protected]`

Computes an expiry time.

This method computes an expiry time by adding a duration to the current time.

Parameters

duration	The duration.

Returns

The expiry time.

5.70.4.10 virtual int Arc::Counter::getLimit ( ) `[pure virtual]`

Returns the current limit of the counter.

This method returns the current limit of the counter, i.e. how many units can be reserved simultaneously by different threads without claiming high priority.

Returns

The current limit of the counter.

Implemented in Arc::IntraProcessCounter.

5.70.4.11 virtual int Arc::Counter::getValue ( ) `[pure virtual]`

Returns the current value of the counter.

Returns the current value of the counter, i.e. the number of unreserved units. Initially, the value is equal to the limit of the counter. When a reservation is made, the the value is decreased. Normally, the value should never be negative, but this may happen if there are prioritized reservations. It can also happen if the limit is decreased after some reservations have been made, since reservations are never revoked.

Returns

The current value of the counter.

Implemented in Arc::IntraProcessCounter.

5.70.4.12 virtual **CounterTicket** Arc::Counter::reserve (int *amount* = `1`, Glib::TimeVal *duration* = **ETERNAL**, bool *prioritized* = `false`, Glib::TimeVal *timeOut* = **ETERNAL**) `[pure virtual]`

Makes a reservation from the counter.

This method makes a reservation from the counter. If the current value of the counter is too low to allow for the reservation, the method blocks until the reservation is possible or times out.

Parameters

amount	The amount to reserve, default value is 1.
duration	The duration of a self expiring reservation, default is that it lasts forever.
prioritized	Whether this reservation is prioritized and thus allowed to use the excess limit.
timeOut	The maximum time to block if the value of the counter is too low, default is to allow "eternal" blocking.

Returns

A CounterTicket that can be queried about the status of the reservation as well as for cancellations and extensions.

Implemented in Arc::IntraProcessCounter.

5.70.4.13 virtual int Arc::Counter::setExcess (int *newExcess*) `[pure virtual]`

Sets the excess limit of the counter.

This method sets a new excess limit for the counter.

Parameters

newExcess	The new excess limit, an absolute number.

Returns

The new excess limit.

Implemented in Arc::IntraProcessCounter.

5.70.4.14 virtual int Arc::Counter::setLimit (int *newLimit*) `[pure virtual]`

Sets the limit of the counter.

This method sets a new limit for the counter.

Parameters

newLimit	The new limit, an absolute number.

Returns

The new limit.

Implemented in Arc::IntraProcessCounter.

The documentation for this class was generated from the following file:

- Counter.h

5.71 Arc::CounterTicket Class Reference

```
#include <Counter.h>
```

Public Member Functions

- CounterTicket ()
- bool isValid ()
- void extend (Glib::TimeVal duration)
- void cancel ()

Friends

- class Counter

5.71.1 Detailed Description

A class for "tickets" that correspond to counter reservations.

This is a class for reservation tickets. When a reservation is made from a Counter, a ReservationTicket is returned. This ticket can then be queried about the validity of a reservation. It can also be used for cancelation and extension of reservations.

Typical usage is:

```
// Declare a counter. Replace XYZ by some appropriate kind of
// counter and provide required parameters. Unit is MB.
XYZCounter memory(...);
...
// Make a reservation of memory for 2000000 doubles.
CounterTicket tick = memory.reserve(2*sizeof(double));
// Use the memory.
double* A=new double[2000000];
doSomething(A);
delete[] A;
// Cancel the reservation.
tick.cancel();
```

5.71.2 Constructor & Destructor Documentation

5.71.2.1 Arc::CounterTicket::CounterTicket ( )

The default constructor.

This is the default constructor. It creates a CounterTicket that is not valid. The ticket object that is created can later be assigned a ticket that is returned by the reserve() method of a Counter.

5.71.3 Member Function Documentation

5.71.3.1 void Arc::CounterTicket::cancel ( )

Cancels a resrvation.

This method is called to cancel a reservation. It may be called also for self-expiring reservations, which will then be cancelled before they were originally planned to expire.

5.71.3.2 void Arc::CounterTicket::extend (Glib::TimeVal *duration*)

Extends a reservation.

Extends a self-expiring reservation. In order to succeed the extension should be made before the previous reservation expires.

Parameters

duration	The time by which to extend the reservation. The new expiration time is computed based on the current time, NOT the previous expiration time.

5.71.3.3 bool Arc::CounterTicket::isValid ( )

Returns the validity of a CounterTicket.

This method checks whether a CounterTicket is valid. The ticket was probably returned earlier by the reserve() method of a Counter but the corresponding reservation may have expired.

Returns

The validity of the ticket.

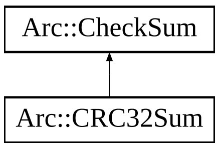
The documentation for this class was generated from the following file:

- Counter.h

5.72 Arc::CRC32Sum Class Reference

```
#include <CheckSum.h>
```

Inheritance diagram for Arc::CRC32Sum:



Public Member Functions

- virtual void start (void)
- virtual void add (void ∗buf, unsigned long long int len)
- virtual void end (void)
- virtual void result (unsigned char ∗&res, unsigned int &len) const
- virtual int print (char ∗buf, int len) const
- virtual void scan (const char ∗buf)
- virtual operator bool (void) const
- virtual bool operator! (void) const

5.72.1 Detailed Description

Implementation of CRC32 checksum.

This class is a specialized class of the CheckSum class. It provides an implementation for the CRC-32 IEEE 802.3 standard.

5.72.2 Member Function Documentation

5.72.2.1 virtual void Arc::CRC32Sum::add (void ∗ *buf*, unsigned long long int *len*) [virtual]

Add data to be checksummed.

This method calculates the checksum of the passed data chuck, taking into account the previous state of this object.

Parameters

buf	pointer to data chuck to be checksummed.
len	size of the data chuck.

Implements Arc::CheckSum.

5.72.2.2 virtual void Arc::CRC32Sum::end (void) [virtual]

Finalize the checksumming.

This method finalizes the checksum algorithm, that is calculating the final checksum result.

Implements Arc::CheckSum.

5.72.2.3 virtual int Arc::CRC32Sum::print (char ∗ *buf*, int *len*) const [virtual]

Retrieve result of checksum into a string.

The passed string buf is filled with result of checksum algorithm in base 16. At most len chacters is filled into buffer buf. The hexadecimal value is prepended with "<algorithm>:", where <algorithm> is one of "cksum", "md5" or "adler32" respectively corresponding to the result from the CRC32Sum, MD5Sum and Adler32 classes.

Parameters

buf	pointer to buffer which should be filled with checksum result.
len	max number of character filled into buffer.

Reimplemented from Arc::CheckSum.

5.72.2.4 virtual void Arc::CRC32Sum::scan (const char ∗ *buf*) [virtual]

Set internal checksum state.

This method sets the internal state to that of the passed textural representation. The format passed to this method must be the same as retrieved from the CheckSum::print method.

Parameters

buf	string containing textural representation of checksum

See also

CheckSum::print

Implements Arc::CheckSum.

5.72.2.5 virtual void Arc::CRC32Sum::start (void) [virtual]

Initiate the checksum algorithm.

This method must be called before starting a new checksum calculation.

Implements Arc::CheckSum.

The documentation for this class was generated from the following file:

- CheckSum.h

5.73 Arc::Credential Class Reference

```
#include <Credential.h>
```

Public Member Functions

- Credential ()
- Credential (int keybits)
- Credential (const std::string &CAfile, const std::string &CAkey, const std::string &CAserial, const std::string &extfile, const std::string &extsect, const std::string &passphrase4key)
- Credential (Time start, Period lifetime=Period("PT12H"), int keybits=1024, std::string proxyversion="rfc", std::string policylang="inheritAll", std::string policy="", int pathlength=-1)
- Credential (const std::string &cert, const std::string &key, const std::string &cadir, const std::string &cafile, const std::string &passphrase4key="", const bool is_file=true)
- Credential (const UserConfig &usercfg, const std::string &passphrase4key="")
- void AddCertExtObj (std::string &sn, std::string &oid)
- void LogError (void) const
- bool GetVerification (void) const
- EVP_PKEY ∗ GetPrivKey (void) const
- EVP_PKEY ∗ GetPubKey (void) const
- X509 ∗ GetCert (void) const
- X509_REQ ∗ GetCertReq (void) const

- STACK_OF (X509)∗GetCertChain(void) const
- int GetCertNumofChain (void) const
- Credformat getFormat (BIO ∗in, const bool is_file=true) const
- std::string GetDN (void) const
- std::string GetIdentityName (void) const
- ArcCredential::certType GetType (void) const
- std::string GetIssuerName (void) const
- std::string GetCAName (void) const
- std::string GetProxyPolicy (void) const
- void SetProxyPolicy (const std::string &proxyversion, const std::string &policy-lang, const std::string &policy, int pathlength)
- bool OutputPrivatekey (std::string &content, bool encryption=false, const std-::string &passphrase="")
- bool OutputPublickey (std::string &content)
- bool OutputCertificate (std::string &content, bool is_der=false)
- bool OutputCertificateChain (std::string &content, bool is_der=false)
- Period GetLifeTime (void) const
- Time GetStartTime () const
- Time GetEndTime () const
- void SetLifeTime (const Period &period)
- void SetStartTime (const Time &start_time)
- bool IsValid (void)
- bool AddExtension (const std::string &name, const std::string &data, bool crit=false)
- bool AddExtension (const std::string &name, char ∗∗binary)
- std::string GetExtension (const std::string &name)
- bool GenerateEECRequest (BIO ∗reqbio, BIO ∗keybio, const std::string &dn="")
- bool GenerateEECRequest (std::string &reqcontent, std::string &keycontent, const std::string &dn="")
- bool GenerateEECRequest (const char ∗request_filename, const char ∗key_-filename, const std::string &dn="")
- bool GenerateRequest (BIO ∗bio, bool if_der=false)
- bool GenerateRequest (std::string &content, bool if_der=false)
- bool GenerateRequest (const char ∗filename, bool if_der=false)
- bool InquireRequest (BIO ∗reqbio, bool if_eec=false, bool if_der=false)
- bool InquireRequest (std::string &content, bool if_eec=false, bool if_der=false)
- bool InquireRequest (const char ∗filename, bool if_eec=false, bool if_der=false)
- bool SignRequest (Credential ∗proxy, BIO ∗outputbio, bool if_der=false)
- bool SignRequest (Credential ∗proxy, std::string &content, bool if_der=false)
- bool SignRequest (Credential ∗proxy, const char ∗filename, bool foamat=false)
- bool SelfSignEECRequest (const std::string &dn, const char ∗extfile, const std-::string &extsect, const char ∗certfile)
- bool SignEECRequest (Credential ∗eec, const std::string &dn, BIO ∗outputbio)
- bool SignEECRequest (Credential ∗eec, const std::string &dn, std::string &con-tent)
- bool SignEECRequest (Credential ∗eec, const std::string &dn, const char ∗filename)

Static Public Member Functions

- static void InitProxyCertInfo (void)
- static bool IsCredentialsValid (const UserConfig &usercfg)

5.73.1 Detailed Description

Credential class covers the functionality about general processing about certificate/key files, including: 1. cerficate/key parsing, information extracting (such as subject name, issuer name, lifetime, etc.), chain verifying, extension processing about proxy certinfo, extension processing about other general certificate extension (such as voms attributes, it should be the extension-specific code itself to create, parse and verify the extension, not the Credential class. For voms, it is some code about writing and parsing voms-implementing Attibute Certificate/ RFC3281, the voms-attibute is then be looked as a binary part and embeded into extension of X509 certificate/proxy certificate); 2. certificate request, extension emeding and certificate signing, for both proxy certificate and EEC (end entity certificate) certificate The Credential class support PEM, DER PKCS12 credential.

5.73.2 Constructor & Destructor Documentation

5.73.2.1 Arc::Credential::Credential ( )

Default constructor, only acts as a container for inquiring certificate request, is meaningless for any other use.

5.73.2.2 Arc::Credential::Credential (int *keybits*)

Constructor with user-defined keylength. Needed for creation of EE certs, since some applications will only support keys with a certain minimum length $>$ 1024

5.73.2.3 Arc::Credential::Credential (const std::string & *CAfile*, const std::string & *CAkey*, const std::string & *CAserial*, const std::string & *extfile*, const std::string & *extsect*, const std::string & *passphrase4key*)

Constructor, specific constructor for CA certificate is meaningless for any other use.

5.73.2.4 Arc::Credential::Credential (Time *start*, Period *lifetime* = Period `("PT12H")`, int *keybits* = `1024`, std::string *proxyversion* = `"rfc"`, std::string *policylang* = `"inheritAll"`, std::string *policy* = `""`, int *pathlength* = `-1`)

Constructor, specific constructor for proxy certificate, only acts as a container for constraining certificate signing and/or generating certificate request(only keybits is useful for creating certificate request), is meaningless for any other use. The proxyversion and policylang is for specifying the proxy certificate type and the policy language inside proxy. The definition of proxyversion and policy language is based on http://dev.globus.org/wiki/Security/ProxyCertTypes#RFC-_3820_Proxy_Certificates The code is supposed to support proxy version: GSI2(legacy proxy), GSI3(Proxy draft) and RFC(RFC3820 proxy), and correspoding policy language. GSI2(GSI2, GSI2_LIMITED) GSI3 and RFC (IMPERSONATION_P-ROXY--1.3.6.1.5.5.7.21.1, INDEPENDENT_PROXY--1.3.6.1.5.5.7.21.2, LIMITED_PR-OXY--1.3.6.1.4.1.3536.1.1.1.9, RESTRICTED_PROXY--policy language undefined) In openssl>=098, there are three types of policy languages: id-ppl-inheritAll--1.3.6.1.5.5.-7.21.1, id-ppl-independent--1.3.6.1.5.5.7.21.2, and id-ppl-anyLanguage-1.3.6.1.5.5.7.-21.0

Parameters

start,start	time of proxy certificate
life-time,lifetime	of proxy certificate
key-bits,modulus	size for RSA key generation, it should be greater than 1024 if 'this' class is used for generating X509 request; it should be '0' if 'this' class is used for constraing certificate signing.

5.73.2.5 Arc::Credential::Credential (const std::string & *cert*, const std::string & *key*, const std::string & *cadir*, const std::string & *cafile*, const std::string & *passphrase4key* = " ", const bool *is_file* = `true`)

Constructor, specific constructor for usual certificate, constructing from credential files. only acts as a container for parsing the certificate and key files, is meaningless for any other use. this constructor will parse the credential information, and put them into "this" object

Parameters

passphrase4key,specifies	the password for descrypting private key (if needed). If value is empty then password will be asked interrctively. To avoid askig for password use value provided by NoPassword() method.
is_-file,specifies	if the cert/key are from file, otherwise they are supposed to be from string. default is from file

5.73.2.6 Arc::Credential::Credential (const UserConfig & *usercfg*, const std::string & *passphrase4key* = " ")

Constructor, specific constructor for usual certificate, constructing from information in UserConfig object. Only acts as a container for parsing the certificate and key files, is meaningless for any other use. this constructor will parse the credential ∗ information, and put them into "this" object

Parameters

is_-file,specify	if the cert/key are from file, otherwise they are supposed to be from string. default is from file

5.73.3 Member Function Documentation

5.73.3.1 void Arc::Credential::AddCertExtObj (std::string & *sn,* std::string & *oid*)

General method for adding a new nid into openssl's global const

5.73.3.2 bool Arc::Credential::AddExtension (const std::string & *name,* const std::string & *data,* bool *crit* = `false`)

Add an extension to the extension part of the certificate

Parameters

name,the	name of the extension, there OID related with the name should be registered into openssl firstly
data,the	data which will be inserted into certificate extension

5.73.3.3 bool Arc::Credential::AddExtension (const std::string & *name,* char ∗∗ *binary*)

Add an extension to the extension part of the certificate

Parameters

binary,the	data which will be inserted into certificate extension part as a specific extension there should be specific methods defined inside specific - X509V3_EXT_METHOD structure to parse the specific extension format. For example, VOMS attribute certificate is a specific extension to proxy certificate. There is specific X509V3_EXT_METHOD defined in VOMSAttribute.h and VOMSAttribute.c for parsing attribute certificate. In openssl, the specific X509V3_EXT_METHOD can be got according to the extension name/id, see X509V3_EXT_get_nid(ext_nid)

5.73.3.4 bool Arc::Credential::GenerateEECRequest (BIO ∗ *reqbio,* BIO ∗ *keybio,* const std::string & *dn* = " ")

Generate an EEC request, based on the keybits and signing algorithm information inside this object output the certificate request to output BIO

The user will be asked for a private key password

5.73.3.5 bool Arc::Credential::GenerateEECRequest (std::string & *reqcontent,* std::string & *keycontent,* const std::string & *dn* = " ")

Generate an EEC request, output the certificate request to a string

5.73.3.6 bool Arc::Credential::GenerateEECRequest (const char ∗ *request_filename,* const char ∗ *key_filename,* const std::string & *dn =* "")

Generate an EEC request, output the certificate request and the key to a file

5.73.3.7 bool Arc::Credential::GenerateRequest (BIO ∗ *bio,* bool *if_der =* `false`)

Generate a proxy request, base on the keybits and signing algorithm information inside this object output the certificate request to output BIO

5.73.3.8 bool Arc::Credential::GenerateRequest (std::string & *content,* bool *if_der =* `false`)

Generate a proxy request, output the certificate request to a string

5.73.3.9 bool Arc::Credential::GenerateRequest (const char ∗ *filename,* bool *if_der =* `false`)

Generate a proxy request, output the certificate request to a file

5.73.3.10 std::string Arc::Credential::GetCAName (void) const

Get CA of the certificate attached to this object, if the certificate is an EEC, GetCAName get the same value as GetIssuerName

5.73.3.11 X509∗ Arc::Credential::GetCert (void) const

Get the certificate attached to this object

5.73.3.12 int Arc::Credential::GetCertNumofChain (void) const

Get the number of certificates in the certificate chain attached to this object

5.73.3.13 X509_REQ∗ Arc::Credential::GetCertReq (void) const

Get the certificate request, if there is any

5.73.3.14 std::string Arc::Credential::GetDN (void) const

Get the DN of the certificate attached to this object

5.73.3.15 Time Arc::Credential::GetEndTime ( ) const

Returns validity end time of certificate or proxy

5.73.3.16 std::string Arc::Credential::GetExtension (const std::string & *name*)

Get the specific extension (named by the parameter) in a certificate this function is only supposed to be called after certificate and key are loaded by the constructor for usual certificate

Parameters

name,the	name of the extension to get

5.73.3.17 Credformat Arc::Credential::getFormat (BIO ∗ *in*, const bool *is_file* = `true`) const

Get the certificate format, PEM PKCS12 or DER BIO could be memory or file, they should be processed differently.

5.73.3.18 std::string Arc::Credential::GetIdentityName (void) const

Get the Identity name of the certificate attached to this object, the result will not include proxy CN

5.73.3.19 std::string Arc::Credential::GetIssuerName (void) const

Get issuer of the certificate attached to this object

5.73.3.20 Period Arc::Credential::GetLifeTime (void) const

Returns lifetime of certificate or proxy

5.73.3.21 EVP_PKEY∗ Arc::Credential::GetPrivKey (void) const

Get the private key attached to this object

5.73.3.22 std::string Arc::Credential::GetProxyPolicy (void) const

Get the proxy policy attached to the "proxy certificate information" extension of the proxy certicate

5.73.3.23 EVP_PKEY∗ Arc::Credential::GetPubKey (void) const

Get the public key attached to this object

5.73.3.24 Time Arc::Credential::GetStartTime ( ) const

Returns validity start time of certificate or proxy

5.73.3.25 ArcCredential::certType Arc::Credential::GetType (void) const

Get type of the certificate attached to this object

5.73.3.26 bool Arc::Credential::GetVerification (void) const [inline]

Get the verification result about certificate chain checking

5.73.3.27 static void Arc::Credential::InitProxyCertInfo (void) [static]

Initiate nid for proxy certificate extension

5.73.3.28 bool Arc::Credential::InquireRequest (BIO ∗ *reqbio*, bool *if_eec* = false, bool *if_der* = false)

Inquire the certificate request from BIO, and put the request information to X509_REQ inside this object, and parse the certificate type from the PROXYCERTINFO of request' extension

Parameters

if_der	false for PEM; true for DER

5.73.3.29 bool Arc::Credential::InquireRequest (std::string & *content*, bool *if_eec* = false, bool *if_der* = false)

Inquire the certificate request from a string

5.73.3.30 bool Arc::Credential::InquireRequest (const char ∗ *filename*, bool *if_eec* = false, bool *if_der* = false)

Inquire the certificate request from a file

5.73.3.31 static bool Arc::Credential::IsCredentialsValid (const UserConfig & *usercfg*) [static]

Returns true if credentials are valid. Credentials are read from locations specified in UserConfig object. This method is deprecated. User per-instance method IsValid() instead.

5.73.3.32 bool Arc::Credential::IsValid (void)

Returns true if credentials are valid

5.73.3.33 void Arc::Credential::LogError (void) const

Log error information related with openssl

5.73.3.34 bool Arc::Credential::OutputCertificate (std::string & *content*, bool *is_der* = `false`)

Output the certificate into string

Parameters

is_der	false for PEM, true for DER

5.73.3.35 bool Arc::Credential::OutputCertificateChain (std::string & *content*, bool *is_der* = `false`)

Output the certificate chain into string

Parameters

is_der	false for PEM, true for DER

5.73.3.36 bool Arc::Credential::OutputPrivatekey (std::string & *content*, bool *encryption* = `false`, const std::string & *passphrase* = " ")

Output the private key into string

Parameters

encryption,whether	encrypt the output private key or not
passphrase,the	passphrase to encrypt the output private key

5.73.3.37 bool Arc::Credential::OutputPublickey (std::string & *content*)

Output the public key into string

5.73.3.38 bool Arc::Credential::SelfSignEECRequest (const std::string & *dn*, const char ∗ *extfile*, const std::string & *extsect*, const char ∗ *certfile*)

Self sign a certificate. This functionality is specific for creating a CA credential by using this Credential class.

Parameters

dn	the DN for the subject
extfile	the configration file which includes the extension information, typically the openssl.cnf file
extsect	the section/group name for the extension, e.g. in openssl.cnf, usr_cert and v3_ca
certfile	the certificate file, which contains the signed certificate

5.73.3.39 void Arc::Credential::SetLifeTime (const Period & *period*)

Set lifetime of certificate or proxy

5.73.3.40 void Arc::Credential::SetProxyPolicy (const std::string & *proxyversion,* const std::string & *policylang,* const std::string & *policy,* int *pathlength*)

Set the proxy policy attached to the "proxy certificate information" extension of the proxy certicate

5.73.3.41 void Arc::Credential::SetStartTime (const Time & *start_time*)

Set start time of certificate or proxy

5.73.3.42 bool Arc::Credential::SignEECRequest (Credential ∗ *eec,* const std::string & *dn,* BIO ∗ *outputbio*)

Sign eec request, and output the signed certificate to output BIO

5.73.3.43 bool Arc::Credential::SignEECRequest (Credential ∗ *eec,* const std::string & *dn,* std::string & *content*)

Sign request and output the signed certificate to a string

5.73.3.44 bool Arc::Credential::SignEECRequest (Credential ∗ *eec,* const std::string & *dn,* const char ∗ *filename*)

Sign request and output the signed certificate to a file

5.73.3.45 bool Arc::Credential::SignRequest (Credential ∗ *proxy,* BIO ∗ *outputbio,* bool *if_der* = `false`)

Sign request based on the information inside proxy, and output the signed certificate to output BIO

Parameters

if_der	false for PEM, true for DER

5.73.3.46 bool Arc::Credential::SignRequest (Credential ∗ *proxy,* std::string & *content,* bool *if_der* = `false`)

Sign request and output the signed certificate to a string

Parameters

if_der	false for PEM, true for DER

5.73.3.47 bool Arc::Credential::SignRequest (Credential ∗ *proxy,* const char ∗ *filename,* bool *foamat* = `false`)

Sign request and output the signed certificate to a file

Parameters

if_der	false for PEM, true for DER

5.73.3.48 Arc::Credential::STACK_OF (X509) const

Get the certificate chain attached to this object

The documentation for this class was generated from the following file:

- Credential.h

5.74 Arc::CredentialError Class Reference

```
#include <Credential.h>
```

Public Member Functions

- CredentialError (const std::string &what="")

5.74.1 Detailed Description

This is an exception class that is used to handle runtime errors discovered in the -Credential class.

5.74.2 Constructor & Destructor Documentation

5.74.2.1 Arc::CredentialError::CredentialError (const std::string & *what* = "")

This is the constructor of the CredentialError class.

Parameters

what	An explanation of the error.

The documentation for this class was generated from the following file:

- Credential.h

5.75 Arc::CredentialStore Class Reference

```
#include <CredentialStore.h>
```

5.75.1 Detailed Description

This class provides functionality for storing delegated crdentials and retrieving them from some store services. This is very preliminary implementation and currently support only one type of credentials - X.509 proxies, and only one type of store service - MyProxy. Later it will be extended to support at least following services: ARC delegation service, VOMS service, local file system.

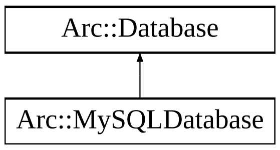
The documentation for this class was generated from the following file:

- CredentialStore.h

5.76 Arc::Database Class Reference

```
#include <DBInterface.h>
```

Inheritance diagram for Arc::Database:



Public Member Functions

- Database ()

- Database (std::string &server, int port)
- Database (const Database &other)
- virtual ∼Database ()
- virtual bool connect (std::string &dbname, std::string &user, std::string &password)=0
- virtual bool isconnected () const =0
- virtual void close ()=0
- virtual bool enable_ssl (const std::string &keyfile="", const std::string &certfile="", const std::string &cafile="", const std::string &capath="")=0
- virtual bool shutdown ()=0

5.76.1 Detailed Description

Interface for calling database client library.

For different types of database client library, different classes should be implemented by implementing this interface.

5.76.2 Constructor & Destructor Documentation

5.76.2.1 Arc::Database::Database ( ) `[inline]`

Default constructor

5.76.2.2 Arc::Database::Database (std::string & *server,* int *port*) `[inline]`

Constructor which uses the server's name(or IP address) and port as parametes

5.76.2.3 Arc::Database::Database (const Database & *other*) `[inline]`

Copy constructor

5.76.2.4 virtual Arc::Database::∼Database ( ) `[inline, virtual]`

Deconstructor

5.76.3 Member Function Documentation

5.76.3.1 virtual void Arc::Database::close ( ) `[pure virtual]`

Close the connection with database server

Implemented in Arc::MySQLDatabase.

5.76.3.2 virtual bool Arc::Database::connect (std::string & *dbname*, std::string & *user*, std::string & *password*) `[pure virtual]`

Do connection with database server

Parameters

dbname	The database name which will be used.
user	The username which will be used to access database.
password	The password which will be used to access database.

Implemented in Arc::MySQLDatabase.

5.76.3.3 virtual bool Arc::Database::enable_ssl (const std::string & *keyfile* = `""`, const std::string & *certfile* = `""`, const std::string & *cafile* = `""`, const std::string & *capath* = `""`) `[pure virtual]`

Enable ssl communication for the connection

Parameters

keyfile	The location of key file.
certfile	The location of certificate file.
cafile	The location of ca file.
capath	The location of ca directory

Implemented in Arc::MySQLDatabase.

5.76.3.4 virtual bool Arc::Database::isconnected ( ) const `[pure virtual]`

Get the connection status

Implemented in Arc::MySQLDatabase.

5.76.3.5 virtual bool Arc::Database::shutdown ( ) `[pure virtual]`

Ask database server to shutdown

Implemented in Arc::MySQLDatabase.

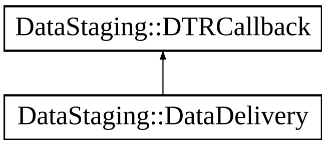
The documentation for this class was generated from the following file:

- DBInterface.h

5.77 DataStaging::DataDelivery Class Reference

`#include <DataDelivery.h>`

Inheritance diagram for DataStaging::DataDelivery:



Public Member Functions

- DataDelivery ()
- ∼DataDelivery ()
- virtual void receiveDTR (DTR_ptr request)
- bool cancelDTR (DTR_ptr request)
- bool start ()
- bool stop ()
- void SetTransferParameters (const TransferParameters &params)

5.77.1 Detailed Description

DataDelivery transfers data between specified physical locations.

All meta-operations for a DTR such as resolving replicas must be done before sending to DataDelivery. Calling receiveDTR() starts a new process which performs data transfer as specified in DTR.

5.77.2 Member Function Documentation

5.77.2.1 virtual void DataStaging::DataDelivery::receiveDTR (DTR_ptr *request*) `[virtual]`

Pass a DTR to Delivery.

This method is called by the scheduler to pass a DTR to the delivery. The DataDelivery starts a process to do the processing, and then returns. DataDelivery's own thread then monitors the started process.

Implements DataStaging::DTRCallback.

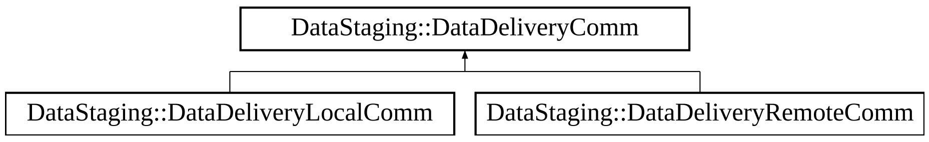
The documentation for this class was generated from the following file:

- DataDelivery.h

5.78 DataStaging::DataDeliveryComm Class Reference

```
#include <DataDeliveryComm.h>
```

Inheritance diagram for DataStaging::DataDeliveryComm:


DataStaging::DataDeliveryComm
DataStaging::DataDeliveryLocalComm
DataStaging::DataDeliveryRemoteComm

Data Structures

- struct Status

  Plain C struct to pass information from executing process back to main thread.

Public Types

- enum CommStatusType { CommInit, CommNoError, CommTimeout, CommClosed, CommExited, CommFailed }

Public Member Functions

- virtual ∼DataDeliveryComm ()
- Status GetStatus () const
- std::string GetError () const
- virtual operator bool () const =0
- virtual bool operator! () const =0

Static Public Member Functions

- static DataDeliveryComm ∗ CreateInstance (DTR_ptr dtr, const TransferParameters &params)
- static bool CheckComm (DTR_ptr dtr, std::vector< std::string > &allowed_dirs)

Protected Member Functions

- virtual void PullStatus ()=0
- DataDeliveryComm (DTR_ptr dtr, const TransferParameters &params)

Protected Attributes

- Status status_
- Status status_buf_
- unsigned int status_pos_
- Glib::Mutex lock_

- DataDeliveryCommHandler ∗ handler_
- std::string dtr_id
- TransferParameters transfer_params
- Arc::Time start_
- DTRLogger logger_

5.78.1 Detailed Description

This class provides an abstract interface for the Delivery layer.

Different implementations provide different ways of providing Delivery functionality. - DataDeliveryLocalComm launches a local process to perform the transfer and Data- DeliveryRemoteComm contacts a remote service which performs the transfer. The implementation is chosen depending on what is set in the DTR, which the Scheduler should set based on various factors.

CreateInstance() should be used to get a pointer to the instantiated object. This also starts the transfer. Deleting this object stops the transfer and cleans up any used resources. A singleton instance of DataDeliveryCommHandler regularly polls all active transfers using PullStatus() and fills the Status object with current information, which can be obtained through GetStatus().

5.78.2 Member Enumeration Documentation

5.78.2.1 enum **DataStaging::DataDeliveryComm::CommStatusType**

Communication status with transfer.

Enumerator:

CommInit Initializing/starting transfer, rest of information not valid.

CommNoError Communication going on smoothly.

CommTimeout Communication experienced timeout.

CommClosed Communication channel was closed.

CommExited Transfer exited. Mostly same as CommClosed but exit detected before pipe closed.

CommFailed Transfer failed. If we have CommFailed and no error code reported that normally means segfault or external kill.

5.78.3 Constructor & Destructor Documentation

5.78.3.1 DataStaging::DataDeliveryComm::DataDeliveryComm (**DTR_ptr** *dtr*, **const TransferParameters &** *params*) `[protected]`

Start transfer with parameters taken from DTR and supplied transfer limits.

Constructor should not be used directly, CreateInstance() should be used instead.

5.78.4 Member Function Documentation

5.78.4.1 static bool DataStaging::DataDeliveryComm::CheckComm (DTR_ptr *dtr,* std::vector< std::string > & *allowed_dirs*) [static]

Check the delivery is available. Calls CheckComm of the appropriate subclass.

Parameters

dtr	DTR from which credentials are used
allowed_dirs	List of dirs that this comm is allowed to read/write

Reimplemented in DataStaging::DataDeliveryLocalComm, and DataStaging::DataDeliveryRemoteComm.

5.78.4.2 virtual void DataStaging::DataDeliveryComm::PullStatus ( ) [protected, pure virtual]

Check for new state and fill state accordingly.

This method is periodically called by the comm handler to obtain status info. It detects communication and delivery failures and delivery termination.

Implemented in DataStaging::DataDeliveryLocalComm, and DataStaging::DataDeliveryRemoteComm.

The documentation for this class was generated from the following file:

- DataDeliveryComm.h

5.79 DataStaging::DataDeliveryCommHandler Class Reference

```
#include <DataDeliveryComm.h>
```

Public Member Functions

- void Add (DataDeliveryComm ∗item)
- void Remove (DataDeliveryComm ∗item)

Static Public Member Functions

- static DataDeliveryCommHandler ∗ getInstance ()

5.79.1 Detailed Description

Singleton class handling all active DataDeliveryComm objects.

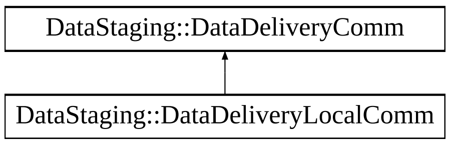
The documentation for this class was generated from the following file:

- DataDeliveryComm.h

5.80 DataStaging::DataDeliveryLocalComm Class Reference

`#include <DataDeliveryLocalComm.h>`

Inheritance diagram for DataStaging::DataDeliveryLocalComm:


DataStaging::DataDeliveryComm
DataStaging::DataDeliveryLocalComm

Public Member Functions

- DataDeliveryLocalComm (DTR_ptr dtr, const TransferParameters &params)
- virtual ∼DataDeliveryLocalComm ()
- virtual void PullStatus ()
- virtual operator bool () const
- virtual bool operator! () const

Static Public Member Functions

- static bool CheckComm (DTR_ptr dtr, std::vector< std::string > &allowed_dirs)

5.80.1 Detailed Description

This class starts, monitors and controls a local Delivery process.

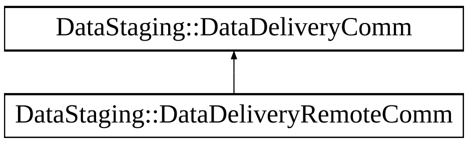
The documentation for this class was generated from the following file:

- DataDeliveryLocalComm.h

5.81 DataStaging::DataDeliveryRemoteComm Class Reference

`#include <DataDeliveryRemoteComm.h>`

Inheritance diagram for DataStaging::DataDeliveryRemoteComm:


DataStaging::DataDeliveryComm
DataStaging::DataDeliveryRemoteComm

Public Member Functions

- virtual void PullStatus ()
- virtual operator bool () const
- virtual bool operator! () const

Static Public Member Functions

- static bool CheckComm (DTR_ptr dtr, std::vector< std::string > &allowed_dirs)

5.81.1 Detailed Description

This class contacts a remote service to make a Delivery request.

The documentation for this class was generated from the following file:

- DataDeliveryRemoteComm.h

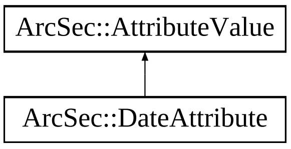
5.82 Arc::DataStagingType Class Reference

The documentation for this class was generated from the following file:

- JobDescription.h

5.83 ArcSec::DateAttribute Class Reference

Inheritance diagram for ArcSec::DateAttribute:



Public Member Functions

- virtual bool equal (AttributeValue ∗other, bool check_id=true)
- virtual std::string encode ()
- virtual std::string getType ()
- virtual std::string getId ()

5.83.1 Member Function Documentation

5.83.1.1 virtual std::string ArcSec::DateAttribute::encode ( ) `[virtual]`

encode the value in a string format

Implements ArcSec::AttributeValue.

5.83.1.2 virtual bool ArcSec::DateAttribute::equal (AttributeValue ∗ *value*, bool *check_id* = `true`) `[virtual]`

Evluate whether "this" equale to the parameter value

Implements ArcSec::AttributeValue.

5.83.1.3 virtual std::string ArcSec::DateAttribute::getId ( ) `[inline, virtual]`

Get the AttributeId of the <Attribute>

Implements ArcSec::AttributeValue.

5.83.1.4 virtual std::string ArcSec::DateAttribute::getType ( ) `[inline, virtual]`

Get the DataType of the <Attribute>

Implements ArcSec::AttributeValue.

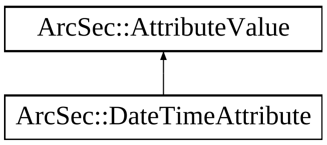
The documentation for this class was generated from the following file:

- DateTimeAttribute.h

5.84 ArcSec::DateTimeAttribute Class Reference

```
#include <DateTimeAttribute.h>
```

Inheritance diagram for ArcSec::DateTimeAttribute:



Public Member Functions

- virtual bool equal (AttributeValue ∗other, bool check_id=true)
- virtual std::string encode ()
- virtual std::string getType ()
- virtual std::string getId ()

5.84.1 Detailed Description

Format: YYYYMMDDHHMMSSZ Day Month DD HH:MM:SS YYYY YYYY-MM-DD HH-:MM:SS YYYY-MM-DDTHH:MM:SS+HH:MM YYYY-MM-DDTHH:MM:SSZ

5.84.2 Member Function Documentation

5.84.2.1 virtual std::string ArcSec::DateTimeAttribute::encode ( ) `[virtual]`

encode the value in a string format

Implements ArcSec::AttributeValue.

5.84.2.2 virtual bool ArcSec::DateTimeAttribute::equal (**AttributeValue** ∗ *value*, bool *check_id* = `true`) `[virtual]`

Evluate whether "this" equale to the parameter value

Implements ArcSec::AttributeValue.

5.84.2.3 virtual std::string ArcSec::DateTimeAttribute::getId ( ) `[inline, virtual]`

Get the AttributeId of the <Attribute>

Implements ArcSec::AttributeValue.

5.84.2.4 virtual std::string ArcSec::DateTimeAttribute::getType ( ) `[inline, virtual]`

Get the DataType of the <Attribute>

Implements ArcSec::AttributeValue.

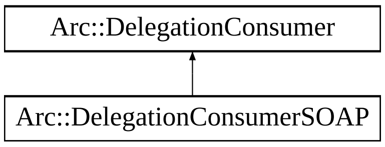
The documentation for this class was generated from the following file:

- DateTimeAttribute.h

5.85 Arc::DelegationConsumer Class Reference

```
#include <DelegationInterface.h>
```

Inheritance diagram for Arc::DelegationConsumer:



Public Member Functions

- DelegationConsumer (void)
- DelegationConsumer (const std::string &content)
- const std::string & ID (void)
- bool Backup (std::string &content)
- bool Restore (const std::string &content)
- bool Request (std::string &content)
- bool Acquire (std::string &content)
- bool Acquire (std::string &content, std::string &identity)

Protected Member Functions

- bool Generate (void)
- void LogError (void)

5.85.1 Detailed Description

A consumer of delegated X509 credentials. During delegation procedure this class acquires delegated credentials aka proxy - certificate, private key and chain of previous certificates. Delegation procedure consists of calling Request() method for generating certificate request followed by call to Acquire() method for making complete credentials from certificate chain.

5.85.2 Constructor & Destructor Documentation

5.85.2.1 Arc::DelegationConsumer::DelegationConsumer (void)

Creates object with new private key

5.85.2.2 Arc::DelegationConsumer::DelegationConsumer (const std::string & *content*)

Creates object with provided private key

5.85.3 Member Function Documentation

5.85.3.1 bool Arc::DelegationConsumer::Acquire (std::string & *content*)

Ads private key into certificates chain in 'content' On exit content contains complete delegated credentials.

5.85.3.2 bool Arc::DelegationConsumer::Acquire (std::string & *content,* std::string & *identity*)

Includes the functionality of Acquire(content) plus extracting the credential identity.

5.85.3.3 bool Arc::DelegationConsumer::Backup (std::string & *content*)

Stores content of this object into a string

5.85.3.4 bool Arc::DelegationConsumer::Generate (void) `[protected]`

Private key

5.85.3.5 const std::string& Arc::DelegationConsumer::ID (void)

Return identifier of this object - not implemented

5.85.3.6 void Arc::DelegationConsumer::LogError (void) `[protected]`

Creates private key

5.85.3.7 bool Arc::DelegationConsumer::Request (std::string & *content*)

Make X509 certificate request from internal private key

5.85.3.8 bool Arc::DelegationConsumer::Restore (const std::string & *content*)

Restores content of object from string

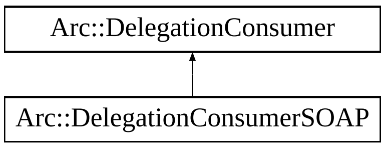
The documentation for this class was generated from the following file:

- DelegationInterface.h

5.86 Arc::DelegationConsumerSOAP Class Reference

`#include <DelegationInterface.h>`

Inheritance diagram for Arc::DelegationConsumerSOAP:



Public Member Functions

- DelegationConsumerSOAP (void)
- DelegationConsumerSOAP (const std::string &content)
- bool DelegateCredentialsInit (const std::string &id, const SOAPEnvelope &in, S-OAPEnvelope &out)
- bool UpdateCredentials (std::string &credentials, const SOAPEnvelope &in, SO-APEnvelope &out)
- bool UpdateCredentials (std::string &credentials, std::string &identity, const SO-APEnvelope &in, SOAPEnvelope &out)
- bool DelegatedToken (std::string &credentials, XMLNode token)

5.86.1 Detailed Description

This class extends DelegationConsumer to support SOAP message exchange. - Implements WS interface `http://www.nordugrid.org/schemas/delegation` described in delegation.wsdl.

5.86.2 Constructor & Destructor Documentation

5.86.2.1 Arc::DelegationConsumerSOAP::DelegationConsumerSOAP (void)

Creates object with new private key

5.86.2.2 Arc::DelegationConsumerSOAP::DelegationConsumerSOAP (const std::string & *content*)

Creates object with specified private key

5.86.3 Member Function Documentation

5.86.3.1 bool Arc::DelegationConsumerSOAP::DelegateCredentialsInit (const std::string & *id,* const SOAPEnvelope & *in,* SOAPEnvelope & *out*)

Process SOAP message which starts delegation. Generated message in 'out' is meant to be sent back to DelagationProviderSOAP. Argument 'id' contains identifier of procedure and is used only to produce SOAP message.

5.86.3.2 bool Arc::DelegationConsumerSOAP::DelegatedToken (std::string & *credentials,* XMLNode *token*)

Similar to UpdateCredentials but takes only DelegatedToken XML element

5.86.3.3 bool Arc::DelegationConsumerSOAP::UpdateCredentials (std::string & *credentials,* const SOAPEnvelope & *in,* SOAPEnvelope & *out*)

Accepts delegated credentials. Process 'in' SOAP message and stores full proxy credentials in 'credentials'. 'out' message is generated for sending to DelagationProviderSOAP.

5.86.3.4 bool Arc::DelegationConsumerSOAP::UpdateCredentials (std::string & *credentials,* std::string & *identity,* const SOAPEnvelope & *in,* SOAPEnvelope & *out*)

Includes the functionality in above UpdateCredentials method; plus extracting the credential identity

The documentation for this class was generated from the following file:

- DelegationInterface.h

5.87 Arc::DelegationContainerSOAP Class Reference

```
#include <DelegationInterface.h>
```

Public Member Functions

- bool DelegatedToken (std::string &credentials, XMLNode token, const std::string &client="")

Protected Member Functions

- virtual DelegationConsumerSOAP ∗ AddConsumer (std::string &id, const std::string &client)
- virtual DelegationConsumerSOAP ∗ FindConsumer (const std::string &id, const std::string &client)

- virtual bool TouchConsumer (DelegationConsumerSOAP ∗c, const std::string &credentials)
- virtual bool QueryConsumer (DelegationConsumerSOAP ∗c, std::string &credentials)
- virtual void ReleaseConsumer (DelegationConsumerSOAP ∗c)
- virtual void RemoveConsumer (DelegationConsumerSOAP ∗c)
- virtual void CheckConsumers (void)
- bool DelegateCredentialsInit (const SOAPEnvelope &in, SOAPEnvelope &out, const std::string &client="")
- bool UpdateCredentials (std::string &credentials, const SOAPEnvelope &in, SOAPEnvelope &out, const std::string &client="")

Protected Attributes

- int max_size_
- int max_duration_
- int max_usage_
- bool context_lock_

5.87.1 Detailed Description

Manages multiple delegated credentials. Delegation consumers are created automatically with DelegateCredentialsInit method up to max_size_ and assigned unique identifier. It's methods are similar to those of DelegationConsumerSOAP with identifier included in SOAP message used to route execution to one of managed DelegationConsumerSOAP instances.

5.87.2 Member Function Documentation

5.87.2.1 virtual DelegationConsumerSOAP∗ Arc::DelegationContainerSOAP::AddConsumer (std::string & *id*, const std::string & *client*) `[protected, virtual]`

Creates new consumer object, if empty assigns id and stores in intenal store

5.87.2.2 virtual void Arc::DelegationContainerSOAP::CheckConsumers (void) `[protected, virtual]`

Periodic management of stored consumers

5.87.2.3 bool Arc::DelegationContainerSOAP::DelegateCredentialsInit (const SOAPEnvelope & *in*, SOAPEnvelope & *out*, const std::string & *client* = "") `[protected]`

See DelegationConsumerSOAP::DelegateCredentialsInit If 'client' is not empty then all subsequent calls involving access to generated credentials must contain same value in their 'client' arguments.

5.87.2.4 bool Arc::DelegationContainerSOAP::DelegatedToken (std::string & *credentials*, XMLNode *token*, const std::string & *client* = "")

See DelegationConsumerSOAP::DelegatedToken

5.87.2.5 virtual DelegationConsumerSOAP∗ Arc::DelegationContainerSOAP::FindConsumer (const std::string & *id*, const std::string & *client*) [protected, virtual]

Finds previously created consumer in internal store

5.87.2.6 virtual bool Arc::DelegationContainerSOAP::QueryConsumer (DelegationConsumerSOAP ∗ *c*, std::string & *credentials*) [protected, virtual]

Obtain stored credentials - not all containers may provide this functionality

5.87.2.7 virtual void Arc::DelegationContainerSOAP::ReleaseConsumer (DelegationConsumerSOAP ∗ *c*) [protected, virtual]

Releases consumer obtained by call to AddConsumer() or FindConsumer()

5.87.2.8 virtual void Arc::DelegationContainerSOAP::RemoveConsumer (DelegationConsumerSOAP ∗ *c*) [protected, virtual]

Releases consumer obtained by call to AddConsumer() or FindConsumer() and deletes it

5.87.2.9 virtual bool Arc::DelegationContainerSOAP::TouchConsumer (DelegationConsumerSOAP ∗ *c*, const std::string & *credentials*) [protected, virtual]

Marks consumer as recently used and acquire new credentials

5.87.2.10 bool Arc::DelegationContainerSOAP::UpdateCredentials (std::string & *credentials*, const SOAPEnvelope & *in*, SOAPEnvelope & *out*, const std::string & *client* = "") [protected]

See DelegationConsumerSOAP::UpdateCredentials

5.87.3 Field Documentation

5.87.3.1 bool **Arc::DelegationContainerSOAP::context_lock_** `[protected]`

If true delegation consumer is deleted when connection context is destroyed

5.87.3.2 int **Arc::DelegationContainerSOAP::max_duration_** `[protected]`

Lifetime of unused delegation consumer

5.87.3.3 int **Arc::DelegationContainerSOAP::max_size_** `[protected]`

Max. number of delegation consumers

5.87.3.4 int **Arc::DelegationContainerSOAP::max_usage_** `[protected]`

Max. times same delegation consumer may accept credentials

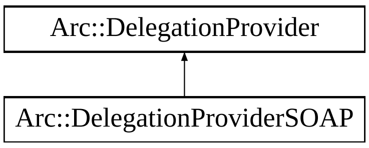
The documentation for this class was generated from the following file:

- DelegationInterface.h

5.88 Arc::DelegationProvider Class Reference

`#include <DelegationInterface.h>`

Inheritance diagram for Arc::DelegationProvider:



Public Member Functions

- DelegationProvider (const std::string &credentials)
- DelegationProvider (const std::string &cert_file, const std::string &key_file, std::istream ∗inpwd=NULL)
- std::string Delegate (const std::string &request, const DelegationRestrictions &restrictions=DelegationRestrictions())

5.88.1 Detailed Description

A provider of delegated credentials. During delegation procedure this class generates new credential to be used in proxy/delegated credential.

5.88.2 Constructor & Destructor Documentation

5.88.2.1 Arc::DelegationProvider::DelegationProvider (const std::string & *credentials*)

Creates instance from provided credentials. Credentials are used to sign delegated credentials. Arguments should contain PEM-encoded certificate, private key and optionally certificates chain.

5.88.2.2 Arc::DelegationProvider::DelegationProvider (const std::string & *cert_file,* const std::string & *key_file,* std::istream ∗ *inpwd* = `NULL`)

Creates instance from provided credentials. Credentials are used to sign delegated credentials. Arguments should contain filesystem path to PEM-encoded certificate and private key. Optionally cert_file may contain certificates chain.

5.88.3 Member Function Documentation

5.88.3.1 std::string Arc::DelegationProvider::Delegate (const std::string & *request,* const DelegationRestrictions & *restrictions* = `DelegationRestrictions()`)

Perform delegation. Takes X509 certificate request and creates proxy credentials excluding private key. Result is then to be fed into DelegationConsumer::Acquire

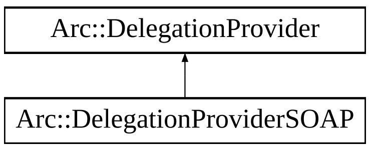
The documentation for this class was generated from the following file:

- DelegationInterface.h

5.89 Arc::DelegationProviderSOAP Class Reference

```
#include <DelegationInterface.h>
```

Inheritance diagram for Arc::DelegationProviderSOAP:



Public Member Functions

- DelegationProviderSOAP (const std::string &credentials)
- DelegationProviderSOAP (const std::string &cert_file, const std::string &key_file, std::istream ∗inpwd=NULL)
- bool DelegateCredentialsInit (MCCInterface &mcc_interface, MessageContext ∗context, ServiceType stype=ARCDelegation)
- bool DelegateCredentialsInit (MCCInterface &mcc_interface, MessageAttributes ∗attributes_in, MessageAttributes ∗attributes_out, MessageContext ∗context, -ServiceType stype=ARCDelegation)
- bool UpdateCredentials (MCCInterface &mcc_interface, MessageContext ∗context, const DelegationRestrictions &restrictions=DelegationRestrictions(), ServiceType stype=ARCDelegation)
- bool UpdateCredentials (MCCInterface &mcc_interface, MessageAttributes ∗attributes_in, MessageAttributes ∗attributes_out, MessageContext ∗context, const DelegationRestrictions &restrictions=DelegationRestrictions(), Service-Type stype=ARCDelegation)
- bool DelegatedToken (XMLNode parent)
- const std::string & ID (void)

5.89.1 Detailed Description

Extension of DelegationProvider with SOAP exchange interface. This class is also a temporary container for intermediate information used during delegation procedure.

5.89.2 Constructor & Destructor Documentation

5.89.2.1 Arc::DelegationProviderSOAP::DelegationProviderSOAP (const std::string & *credentials*)

Creates instance from provided credentials. Credentials are used to sign delegated credentials.

5.89.2.2 Arc::DelegationProviderSOAP::DelegationProviderSOAP (const std::string & *cert_file*, const std::string & *key_file*, std::istream ∗ *inpwd* = `NULL`)

Creates instance from provided credentials. Credentials are used to sign delegated credentials. Arguments should contain filesystem path to PEM-encoded certificate and private key. Optionally cert_file may contain certificates chain.

5.89.3 Member Function Documentation

5.89.3.1 bool Arc::DelegationProviderSOAP::DelegateCredentialsInit (MCCInterface & *mcc_interface*, MessageContext ∗ *context*, ServiceType *stype* = `ARCDelegation`)

Performs DelegateCredentialsInit SOAP operation. As result request for delegated credentials is received by this instance and stored internally. Call to UpdateCredentials should follow.

5.89.3.2 bool Arc::DelegationProviderSOAP::DelegateCredentialsInit (MCCInterface & *mcc_interface*, MessageAttributes ∗ *attributes_in*, MessageAttributes ∗ *attributes_out*, MessageContext ∗ *context*, ServiceType *stype* = `ARCDelegation`)

Extended version of DelegateCredentialsInit(MCCInterface&,MessageContext∗). - Additionally takes attributes for request and response message to make fine control on message processing possible.

5.89.3.3 bool Arc::DelegationProviderSOAP::DelegatedToken (XMLNode *parent*)

Generates DelegatedToken element. Element is created as child of provided XML element and contains structure described in delegation.wsdl.

5.89.3.4 const std::string& Arc::DelegationProviderSOAP::ID (void) `[inline]`

Returns the identifier provided by service accepting delegated credentials. This identifier may then be used to refer to credentials stored at service.

5.89.3.5 bool Arc::DelegationProviderSOAP::UpdateCredentials (MCCInterface & *mcc_interface*, MessageContext ∗ *context*, const DelegationRestrictions & *restrictions* = `DelegationRestrictions()`, ServiceType *stype* = `ARCDelegation`)

Performs UpdateCredentials SOAP operation. This concludes delegation procedure and passes delagated credentials to DelegationConsumerSOAP instance.

5.89.3.6 bool Arc::DelegationProviderSOAP::UpdateCredentials (MCCInterface & *mcc_interface*, MessageAttributes ∗ *attributes_in*, MessageAttributes ∗ *attributes_out*, MessageContext ∗ *context*, const DelegationRestrictions & *restrictions* = `DelegationRestrictions()`, ServiceType *stype* = `ARCDelegation`)

Extended version of UpdateCredentials(MCCInterface&,MessageContext∗). - Additionally takes attributes for request and response message to make fine control on message processing possible.

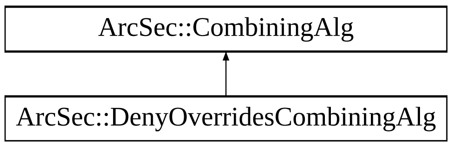
The documentation for this class was generated from the following file:

- DelegationInterface.h

5.90 ArcSec::DenyOverridesCombiningAlg Class Reference

`#include <DenyOverridesAlg.h>`

Inheritance diagram for ArcSec::DenyOverridesCombiningAlg:



Public Member Functions

- virtual Result combine (EvaluationCtx ∗ctx, std::list< Policy ∗ > policies)
- virtual const std::string & getalgId (void) const

5.90.1 Detailed Description

Implement the "Deny-Overrides" algorithm.

Deny-Overrides, scans the policy set which is given as the parameters of "combine" method, if gets "deny" result from any policy, then stops scanning and gives "deny" as result, otherwise gives "permit".

5.90.2 Member Function Documentation

5.90.2.1 virtual Result ArcSec::DenyOverridesCombiningAlg::combine (EvaluationCtx ∗ *ctx*, std::list< Policy ∗ > *policies*) [virtual]

If there is one policy which return negative evaluation result, then omit the other policies and return DECISION_DENY

Parameters

ctx	This object contains request information which will be used to evaluated against policy.
policlies	This is a container which contains policy objects.

Returns

The combined result according to the algorithm.

Implements ArcSec::CombiningAlg.

5.90.2.2 virtual const std::string& ArcSec::DenyOverridesCombiningAlg::getalgId (void) const [inline, virtual]

Get the identifier

Implements ArcSec::CombiningAlg.

The documentation for this class was generated from the following file:

- DenyOverridesAlg.h

5.91 Arc::DiskSpaceRequirementType Class Reference

Data Fields

- Range< int > DiskSpace
- int CacheDiskSpace
- int SessionDiskSpace

5.91.1 Field Documentation

5.91.1.1 int Arc::DiskSpaceRequirementType::CacheDiskSpace

Specifies the required size of cache which must be available to the job in mega-bytes (MB). A negative value undefines this attribute

5.91.1.2 Range<int> Arc::DiskSpaceRequirementType::DiskSpace

Specifies the required size of disk space which must be available to the job in mega-bytes (MB). A negative value undefines this attribute

5.91.1.3 int Arc::DiskSpaceRequirementType::SessionDiskSpace

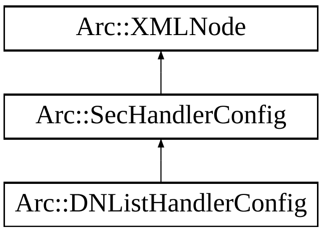
Specifies the required size of job session disk space which must be available to the job in mega-byte (MB). A negative value undefines this attribute.

The documentation for this class was generated from the following file:

- JobDescription.h

5.92 Arc::DNListHandlerConfig Class Reference

Inheritance diagram for Arc::DNListHandlerConfig:



The documentation for this class was generated from the following file:

- ClientInterface.h

5.93 DataStaging::DTR Class Reference

```
#include <DTR.h>
```

Public Member Functions

- DTR ()
- DTR (const std::string &source, const std::string &destination, const Arc::UserConfig &usercfg, const std::string &jobid, const uid_t &uid, DTRLogger log)
- ∼DTR ()
- operator bool () const
- bool operator! () const
- void registerCallback (DTRCallback ∗cb, StagingProcesses owner)
- std::list< DTRCallback ∗ > get_callbacks (const std::map< StagingProcesses, std::list< DTRCallback ∗ > > &proc_callback, StagingProcesses owner)
- void reset ()
- void set_id (const std::string &id)
- std::string get_id () const
- std::string get_short_id () const
- Arc::DataHandle & get_source ()
- const Arc::DataHandle & get_source () const
- Arc::DataHandle & get_destination ()
- const Arc::DataHandle & get_destination () const
- std::string get_source_str () const
- std::string get_destination_str () const
- const Arc::UserConfig & get_usercfg () const
- void set_timeout (time_t value)
- Arc::Time get_timeout () const
- void set_process_time (const Arc::Period &process_time)
- Arc::Time get_process_time () const
- Arc::Time get_creation_time () const
- Arc::Time get_modification_time () const

- std::string get_parent_job_id () const
- void set_priority (int pri)
- int get_priority () const
- void set_rfc_proxy (bool rfc)
- bool is_rfc_proxy () const
- void set_transfer_share (const std::string &share_name)
- std::string get_transfer_share () const
- void set_sub_share (const std::string &share)
- std::string get_sub_share () const
- void set_tries_left (unsigned int tries)
- unsigned int get_tries_left () const
- unsigned int get_initial_tries () const
- void decrease_tries_left ()
- void set_status (DTRStatus stat)
- DTRStatus get_status ()
- void set_error_status (DTRErrorStatus::DTRErrorStatusType error_stat, DTRErrorStatus::DTRErrorLocation error_loc, const std::string &desc="")
- void reset_error_status ()
- DTRErrorStatus get_error_status ()
- void set_bytes_transferred (unsigned long long int bytes)
- unsigned long long int get_bytes_transferred () const
- void set_cancel_request ()
- bool cancel_requested () const
- void set_delivery_endpoint (const Arc::URL &endpoint)
- const Arc::URL & get_delivery_endpoint () const
- void add_problematic_delivery_service (const Arc::URL &endpoint)
- const std::vector< Arc::URL > & get_problematic_delivery_services () const
- void host_cert_for_remote_delivery (bool host)
- bool host_cert_for_remote_delivery () const
- void set_cache_file (const std::string &filename)
- std::string get_cache_file () const
- void set_cache_parameters (const CacheParameters &param)
- const CacheParameters & get_cache_parameters () const
- void set_cache_state (CacheState state)
- CacheState get_cache_state () const
- void set_mapped_source (const std::string &file="")
- std::string get_mapped_source () const
- StagingProcesses get_owner () const
- Arc::User get_local_user () const
- void set_replication (bool rep)
- bool is_replication () const
- void set_force_registration (bool force)
- bool is_force_registration () const
- void set_bulk_start (bool value)
- bool get_bulk_start () const
- void set_bulk_end (bool value)

- bool get_bulk_end () const
- bool bulk_possible ()
- const DTRLogger & get_logger () const
- void connect_logger ()
- void disconnect_logger ()
- bool suspend ()
- bool error () const
- bool is_destined_for_pre_processor () const
- bool is_destined_for_post_processor () const
- bool is_destined_for_delivery () const
- bool came_from_pre_processor () const
- bool came_from_post_processor () const
- bool came_from_delivery () const
- bool came_from_generator () const
- bool is_in_final_state () const

Static Public Member Functions

- static void push (DTR_ptr dtr, StagingProcesses new_owner)

Static Public Attributes

- static const Arc::URL LOCAL_DELIVERY

5.93.1 Detailed Description

Data Transfer Request.

DTR stands for Data Transfer Request and a DTR describes a data transfer between two endpoints, a source and a destination. There are several parameters and options relating to the transfer contained in a DTR. The normal workflow is for a Generator to create a DTR and send it to the Scheduler for processing using dtr.push(SCHEDULER). If the Generator is a subclass of DTRCallback, when the Scheduler has finished with the DTR the receiveDTR() callback method is called.

DTRs should always be used through the ThreadedPointer DTR_ptr. This ensures proper memory management when passing DTRs among various threads. To enforce this policy the copy constructor and assignment operator are private.

registerCallback(this,DataStaging::GENERATOR) can be used to activate the callback. The following simple Generator code sample illustrates how to use DTRs:

```
class MyGenerator : public DTRCallback {
 public:
  void receiveDTR(DTR_ptr dtr);
  void run();
 private:
  Arc::SimpleCondition cond;
};
```

```
void MyGenerator::receiveDTR(DTR_ptr dtr) {
  // DTR received back, so notify waiting condition
  std::cout << "Received DTR " << dtr->get_id() << std::endl;
  cond.signal();
}

void MyGenerator::run() {
  // start Scheduler thread
  Scheduler scheduler;
  scheduler.start();

  // create a DTR
  DTR_ptr dtr(new DTR(source, destination,...));

  // register this callback
  dtr->registerCallback(this,DataStaging::GENERATOR);
  // this line must be here in order to pass the DTR to the Scheduler
  dtr->registerCallback(&scheduler,DataStaging::SCHEDULER);

  // push the DTR to the Scheduler
  DataStaging::DTR::push(dtr, DataStaging::SCHEDULER);

  // wait until callback is called
  cond.wait();
  // DTR is finished, so stop Scheduler
  scheduler.stop();
}
```

A lock protects member variables that are likely to be accessed and modified by multiple threads.

5.93.2 Constructor & Destructor Documentation

5.93.2.1 DataStaging::DTR::DTR (const std::string & *source*, const std::string & *destination*, const **Arc::UserConfig** & *usercfg*, const std::string & *jobid*, const uid_t & *uid*, **DTRLogger** *log*)

Normal constructor.

Construct a new DTR.

Parameters

source	Endpoint from which to read data
destination	Endpoint to which to write data
usercfg	Provides some user configuration information
jobid	ID of the job associated with this data transfer
uid	UID to use when accessing local file system if source or destination is a local file. If this is different to the current uid then the current uid must have sufficient privileges to change uid.
log	ThreadedPointer containing log object. If NULL the root logger is used.

5.93.3 Member Function Documentation

5.93.3.1 void DataStaging::DTR::add_problematic_delivery_service (const Arc::URL & *endpoint*) [inline]

Add problematic endpoint. Should only be those endpoints where there is a problem with the service itself and not the transfer.

5.93.3.2 void DataStaging::DTR::registerCallback (DTRCallback ∗ *cb*, StagingProcesses *owner*)

Register callback objects to be used during DTR processing.

Objects deriving from DTRCallback can be registered with this method. The callback method of these objects will then be called when the DTR is passed to the specified owner. Protected by lock.

5.93.3.3 void DataStaging::DTR::reset ( )

Reset information held on this DTR, such as resolved replicas, error state etc.

Useful when a failed DTR is to be retried.

5.93.3.4 void DataStaging::DTR::set_error_status (DTRErrorStatus::DTRErrorStatus-Type *error_stat*, DTRErrorStatus::DTRErrorLocation *error_loc*, const std::string & *desc* = "")

Set the error status.

The DTRErrorStatus last error state field is set to the current status of the DTR. - Protected by lock.

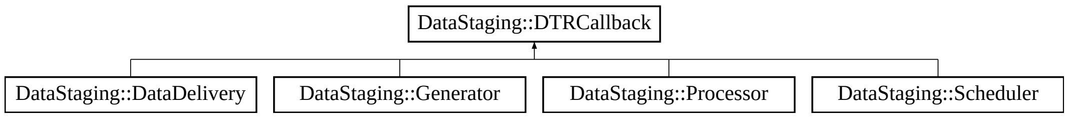
The documentation for this class was generated from the following file:

- DTR.h

5.94 DataStaging::DTRCallback Class Reference

```
#include <DTR.h>
```

Inheritance diagram for DataStaging::DTRCallback:



Public Member Functions

- virtual ∼DTRCallback ()
- virtual void receiveDTR (DTR_ptr dtr)=0

5.94.1 Detailed Description

The base class from which all callback-enabled classes should be derived.

This class is a container for a callback method which is called when a DTR is to be passed to a component. Several components in data staging (eg Scheduler, Generator) are subclasses of DTRCallback, which allows them to receive DTRs through the callback system.

5.94.2 Constructor & Destructor Documentation

5.94.2.1 virtual DataStaging::DTRCallback::∼DTRCallback ( ) `[inline, virtual]`

Empty virtual destructor

5.94.3 Member Function Documentation

5.94.3.1 virtual void DataStaging::DTRCallback::receiveDTR (**DTR_ptr** *dtr*) `[pure virtual]`

Defines the callback method called when a DTR is pushed to this object. The automatic memory management of DTR_ptr ensures that the DTR object is only deleted when the last copy is deleted.

Implemented in DataStaging::Scheduler, DataStaging::Processor, DataStaging::DataDelivery, and DataStaging::Generator.

The documentation for this class was generated from the following file:

- DTR.h

5.95 DataStaging::DTRErrorStatus Class Reference

`#include <DTRStatus.h>`

Public Types

- enum DTRErrorStatusType { NONE_ERROR, INTERNAL_LOGIC_ERROR, INTERNAL_PROCESS_ERROR, SELF_REPLICATION_ERROR, CACHE_ERROR, TEMPORARY_REMOTE_ERROR, PERMANENT_REMOTE_ERROR, LO-

CAL_FILE_ERROR, TRANSFER_SPEED_ERROR, STAGING_TIMEOUT_ERROR }
- enum DTRErrorLocation { NO_ERROR_LOCATION, ERROR_SOURCE, ERROR_DESTINATION, ERROR_TRANSFER, ERROR_UNKNOWN }

Public Member Functions

- DTRErrorStatus (DTRErrorStatusType status, DTRStatus::DTRStatusType error_state, DTRErrorLocation location, const std::string &desc="")
- DTRErrorStatus ()
- DTRErrorStatusType GetErrorStatus () const
- DTRStatus::DTRStatusType GetLastErrorState () const
- DTRErrorLocation GetErrorLocation () const
- std::string GetDesc () const
- bool operator== (const DTRErrorStatusType &s) const
- bool operator== (const DTRErrorStatus &s) const
- bool operator!= (const DTRErrorStatusType &s) const
- bool operator!= (const DTRErrorStatus &s) const
- DTRErrorStatus & operator= (const DTRErrorStatusType &s)

5.95.1 Detailed Description

A class to represent error states reported by various components.

5.95.2 Member Enumeration Documentation

5.95.2.1 enum DataStaging::DTRErrorStatus::DTRErrorLocation

Describes where the error occurred.

Enumerator:

NO_ERROR_LOCATION No error.

ERROR_SOURCE Error with source.

ERROR_DESTINATION Error with destination.

ERROR_TRANSFER Error during transfer not directly related to source or destination.

ERROR_UNKNOWN Error occurred in an unknown location.

5.95.2.2 enum DataStaging::DTRErrorStatus::DTRErrorStatusType

A list of error types.

Enumerator:

NONE_ERROR No error.

INTERNAL_LOGIC_ERROR Internal error in Data Staging logic.

INTERNAL_PROCESS_ERROR Internal processing error, like losing contact with external process.

SELF_REPLICATION_ERROR Attempt to replicate a file to itself.

CACHE_ERROR Permanent error with cache.

TEMPORARY_REMOTE_ERROR Temporary error with remote service.

PERMANENT_REMOTE_ERROR Permanent error with remote service.

LOCAL_FILE_ERROR Error with local file.

TRANSFER_SPEED_ERROR Transfer rate was too slow.

STAGING_TIMEOUT_ERROR Waited for too long to become staging.

The documentation for this class was generated from the following file:

- DTRStatus.h

5.96 DataStaging::DTRList Class Reference

```
#include <DTRList.h>
```

Public Member Functions

- bool add_dtr (DTR_ptr DTRToAdd)
- bool delete_dtr (DTR_ptr DTRToDelete)
- bool filter_dtrs_by_owner (StagingProcesses OwnerToFilter, std::list< DTR_ptr > &FilteredList)
- int number_of_dtrs_by_owner (StagingProcesses OwnerToFilter)
- bool filter_dtrs_by_status (DTRStatus::DTRStatusType StatusToFilter, std::list< DTR_ptr > &FilteredList)
- bool filter_dtrs_by_statuses (const std::vector< DTRStatus::DTRStatusType > &StatusesToFilter, std::list< DTR_ptr > &FilteredList)
- bool filter_dtrs_by_statuses (const std::vector< DTRStatus::DTRStatusType > &StatusesToFilter, std::map< DTRStatus::DTRStatusType, std::list< DTR_ptr > > &FilteredList)
- bool filter_dtrs_by_next_receiver (StagingProcesses NextReceiver, std::list< DTR_ptr > &FilteredList)
- bool filter_pending_dtrs (std::list< DTR_ptr > &FilteredList)
- bool filter_dtrs_by_job (const std::string &jobid, std::list< DTR_ptr > &FilteredList)
- void caching_started (DTR_ptr request)
- void caching_finished (DTR_ptr request)
- bool is_being_cached (DTR_ptr DTRToCheck)
- bool empty ()
- std::list< std::string > all_jobs ()
- void dumpState (const std::string &path)

5.96.1 Detailed Description

Global list of all active DTRs in the system.

This class contains several methods for filtering the list by owner, state etc

5.96.2 Member Function Documentation

5.96.2.1 void DataStaging::DTRList::dumpState (const std::string & *path*)

Dump state of all current DTRs to a destination, eg file, database, url...

Currently only file is supported.

Parameters

path	Path to the file in which to dump state.

5.96.2.2 bool DataStaging::DTRList::filter_dtrs_by_job (const std::string & *jobid,* std::list< DTR_ptr > & *FilteredList*)

Get the list of DTRs corresponding to the given job ID.

Parameters

FilteredList	This list is filled with filtered DTRs

5.96.2.3 bool DataStaging::DTRList::filter_dtrs_by_next_receiver (StagingProcesses *NextReceiver,* std::list< DTR_ptr > & *FilteredList*)

Select DTRs that are about to go to the specified process.

This selection is actually a virtual queue for pre-, post-processor and delivery.

Parameters

FilteredList	This list is filled with filtered DTRs

5.96.2.4 bool DataStaging::DTRList::filter_dtrs_by_owner (StagingProcesses *OwnerToFilter,* std::list< DTR_ptr > & *FilteredList*)

Filter the queue to select DTRs owned by a specified process.

Parameters

FilteredList	This list is filled with filtered DTRs

5.96.2.5 bool DataStaging::DTRList::filter_dtrs_by_status (DTRStatus::DTRStatusType *StatusToFilter*, std::list< DTR_ptr > & *FilteredList*)

Filter the queue to select DTRs with particular status.

If we have only one common queue for all DTRs, this method is necessary to make virtual queues for the DTRs about to go into the pre-, post-processor or delivery stages.

Parameters

FilteredList	This list is filled with filtered DTRs

5.96.2.6 bool DataStaging::DTRList::filter_dtrs_by_statuses (const std::vector< DTRStatus::DTRStatusType > & *StatusesToFilter*, std::list< DTR_ptr > & *FilteredList*)

Filter the queue to select DTRs with particular statuses.

Parameters

FilteredList	This list is filled with filtered DTRs

5.96.2.7 bool DataStaging::DTRList::filter_dtrs_by_statuses (const std::vector< DTRStatus::DTRStatusType > & *StatusesToFilter*, std::map< DTRStatus::DTRStatusType, std::list< DTR_ptr > > & *FilteredList*)

Filter the queue to select DTRs with particular statuses.

Parameters

FilteredList	This map is filled with filtered DTRs, one list per state.

5.96.2.8 bool DataStaging::DTRList::filter_pending_dtrs (std::list< DTR_ptr > & *FilteredList*)

Select DTRs that have just arrived from pre-, post-processor, delivery or generator.

These DTRs need some reaction from the scheduler. This selection is actually a virtual queue of DTRs that need to be processed.

Parameters

FilteredList	This list is filled with filtered DTRs

The documentation for this class was generated from the following file:

- DTRList.h

5.97 DataStaging::DTRStatus Class Reference

```
#include <DTRStatus.h>
```

Public Types

- enum DTRStatusType { NEW, CHECK_CACHE, CHECKING_CACHE, CACHE_WAIT, CACHE_CHECKED, RESOLVE, RESOLVING, RESOLVED, QUERY_REPLICA, QUERYING_REPLICA, REPLICA_QUERIED, PRE_CLEAN, PRE_CLEANING, PRE_CLEANED, STAGE_PREPARE, STAGING_PREPARING, STAGING_PREPARING_WAIT, STAGED_PREPARED, TRANSFER, TRANSFERRING, TRANSFERRING_CANCEL, TRANSFERRED, RELEASE_REQUEST, RELEASING_REQUEST, REQUEST_RELEASED, REGISTER_REPLICA, REGISTERING_REPLICA, REPLICA_REGISTERED, PROCESS_CACHE, PROCESSING_CACHE, CACHE_PROCESSED, DONE, CANCELLED, CANCELLED_FINISHED, ERROR, NULL_STATE }

Public Member Functions

- DTRStatus (const DTRStatusType &status, std::string desc="")
- DTRStatus ()
- bool operator== (const DTRStatusType &s) const
- bool operator== (const DTRStatus &s) const
- bool operator!= (const DTRStatusType &s) const
- bool operator!= (const DTRStatus &s) const
- DTRStatus & operator= (const DTRStatusType &s)
- std::string str () const
- void SetDesc (const std::string &d)
- std::string GetDesc () const
- DTRStatusType GetStatus () const

Static Public Attributes

- static const std::vector < DTRStatus::DTRStatusType > ToProcessStates
- static const std::vector < DTRStatus::DTRStatusType > ProcessingStates
- static const std::vector < DTRStatus::DTRStatusType > StagedStates

5.97.1 Detailed Description

Class representing the status of a DTR.

5.97.2 Member Enumeration Documentation

5.97.2.1 enum DataStaging::DTRStatus::DTRStatusType

Possible state values.

Enumerator:

NEW Just created.

CHECK_CACHE Check the cache for the file may be already there.

CHECKING_CACHE Checking the cache.

CACHE_WAIT Cache file is locked, waiting for its release.

CACHE_CHECKED Cache check completed.

RESOLVE Resolve a meta-protocol.

RESOLVING Resolving replicas.

RESOLVED Replica resolution completed.

QUERY_REPLICA Query a replica.

QUERYING_REPLICA Replica is being queried.

REPLICA_QUERIED Replica was queried.

PRE_CLEAN The destination should be deleted.

PRE_CLEANING Deleting the destination.

PRE_CLEANED The destination file has been deleted.

STAGE_PREPARE Prepare or stage the source and/or destination.

STAGING_PREPARING Making a staging or preparing request.

STAGING_PREPARING_WAIT Wait for the status of the staging/preparing request.

STAGED_PREPARED Staging/preparing request completed.

TRANSFER Transfer ready and can be started.

TRANSFERRING Transfer is going.

TRANSFERRING_CANCEL Transfer is on-going but scheduled for cancellation.

TRANSFERRED Transfer completed.

RELEASE_REQUEST Transfer finished, release requests on the storage.

RELEASING_REQUEST Releasing staging/preparing request.

REQUEST_RELEASED Release of staging/preparing request completed.

REGISTER_REPLICA Register a new replica of the destination.

REGISTERING_REPLICA Registering a replica in an index service.

REPLICA_REGISTERED Replica registration completed.

PROCESS_CACHE Destination is cacheable, process cache.

PROCESSING_CACHE Releasing locks and copying/linking cache files to the session dir.

CACHE_PROCESSED Cache processing completed.

DONE Everything completed successfully.

CANCELLED Cancellation request fulfilled successfully.

CANCELLED_FINISHED Cancellation request fulfilled but DTR also completed transfer successfully.

ERROR Error occured.

NULL_STATE "Stateless" DTR

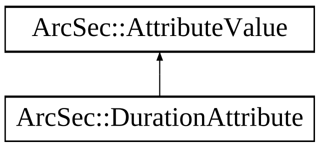
The documentation for this class was generated from the following file:

- DTRStatus.h

5.98 ArcSec::DurationAttribute Class Reference

`#include <DateTimeAttribute.h>`

Inheritance diagram for ArcSec::DurationAttribute:



Public Member Functions

- virtual bool equal (AttributeValue ∗other, bool check_id=true)
- virtual std::string encode ()
- virtual std::string getType ()
- virtual std::string getId ()

5.98.1 Detailed Description

Formate: P??Y??M??DT??H??M??S

5.98.2 Member Function Documentation

5.98.2.1 virtual std::string ArcSec::DurationAttribute::encode ( ) `[virtual]`

encode the value in a string format

Implements ArcSec::AttributeValue.

5.98.2.2 virtual bool ArcSec::DurationAttribute::equal (AttributeValue ∗ *value*, bool *check_id* = true) [virtual]

Evluate whether "this" equale to the parameter value

Implements ArcSec::AttributeValue.

5.98.2.3 virtual std::string ArcSec::DurationAttribute::getId ( ) [inline, virtual]

Get the AttributeId of the <Attribute>

Implements ArcSec::AttributeValue.

5.98.2.4 virtual std::string ArcSec::DurationAttribute::getType ( ) [inline, virtual]

Get the DataType of the <Attribute>

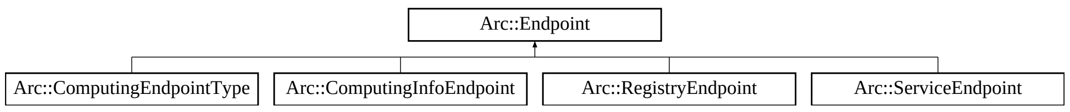
Implements ArcSec::AttributeValue.

The documentation for this class was generated from the following file:

- DateTimeAttribute.h

5.99 Arc::Endpoint Class Reference

Inheritance diagram for Arc::Endpoint:



The documentation for this class was generated from the following file:

- Endpoint.h

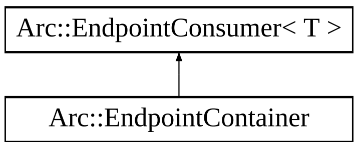
5.100 Arc::EndpointConsumer Class Reference

The documentation for this class was generated from the following file:

- EndpointRetriever.h

5.101 Arc::EndpointContainer Class Reference

Inheritance diagram for Arc::EndpointContainer:



The documentation for this class was generated from the following file:

- EndpointRetriever.h

5.102 Arc::EndpointQueryingStatus Class Reference

Static Public Member Functions

- static std::string str (EndpointQueryingStatusType status)

5.102.1 Member Function Documentation

5.102.1.1 static std::string Arc::EndpointQueryingStatus::str (EndpointQueryingStatusType *status*) `[static]`

Conversion to string.

Conversion from EndpointQueryingStatusType to string.

Parameters

s	The EndpointQueryingStatusType to convert.

The documentation for this class was generated from the following file:

- EndpointQueryingStatus.h

5.103 Arc::EndpointQueryOptions Class Reference

The documentation for this class was generated from the following file:

- EndpointRetriever.h

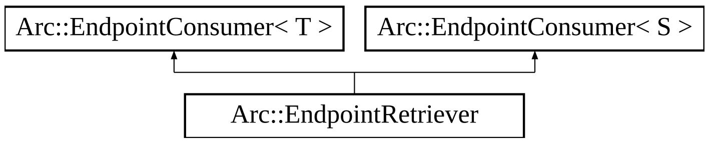
5.104 Arc::EndpointQueryOptions< ServiceEndpoint > Class - Reference

The documentation for this class was generated from the following file:

- EndpointRetriever.h

5.105 Arc::EndpointRetriever Class Reference

Inheritance diagram for Arc::EndpointRetriever:



Data Structures

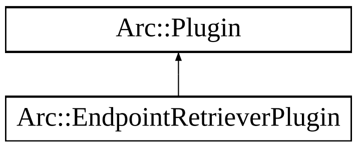
- class Common
- class Result
- class ThreadArg

The documentation for this class was generated from the following file:

- EndpointRetriever.h

5.106 Arc::EndpointRetrieverPlugin Class Reference

Inheritance diagram for Arc::EndpointRetrieverPlugin:

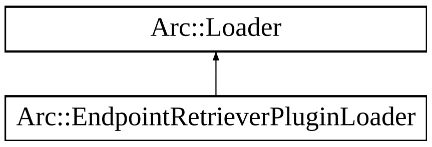


The documentation for this class was generated from the following file:

- EndpointRetriever.h

5.107 Arc::EndpointRetrieverPluginLoader Class Reference

Inheritance diagram for Arc::EndpointRetrieverPluginLoader:



The documentation for this class was generated from the following file:

- EndpointRetriever.h

5.108 Arc::EnvLockWrapper Class Reference

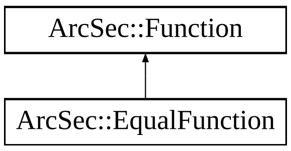
The documentation for this class was generated from the following file:

- Utils.h

5.109 ArcSec::EqualFunction Class Reference

```
#include <EqualFunction.h>
```

Inheritance diagram for ArcSec::EqualFunction:



Public Member Functions

- virtual AttributeValue ∗ evaluate (AttributeValue ∗arg0, AttributeValue ∗arg1, bool check_id=true)
- virtual std::list < AttributeValue ∗ > evaluate (std::list< AttributeValue ∗ > args, bool check_id=true)

Static Public Member Functions

- static std::string getFunctionName (std::string datatype)

5.109.1 Detailed Description

Evaluate whether the two values are equal.

5.109.2 Member Function Documentation

5.109.2.1 virtual **AttributeValue**∗ ArcSec::EqualFunction::evaluate (**AttributeValue** ∗ *arg0*, **AttributeValue** ∗ *arg1*, bool *check_id* = `true`) `[virtual]`

Evaluate two AttributeValue objects, and return one AttributeValue object

Implements ArcSec::Function.

5.109.2.2 virtual std::list<**AttributeValue**∗> ArcSec::EqualFunction::evaluate (std::list< **AttributeValue** ∗ > *args*, bool *check_id* = `true`) `[virtual]`

Evaluate a list of AttributeValue objects, and return a list of Attribute objects

Implements ArcSec::Function.

5.109.2.3 static std::string ArcSec::EqualFunction::getFunctionName (std::string *datatype*) `[static]`

help function to get the FunctionName

The documentation for this class was generated from the following file:

- EqualFunction.h

5.110 ArcSec::EvalResult Struct Reference

```
#include <Result.h>
```

5.110.1 Detailed Description

Struct to record the xml node and effect, which will be used by Evaluator to get the information about which rule/policy(in xmlnode) is satisfied.

The documentation for this struct was generated from the following file:

- Result.h

5.111 ArcSec::EvaluationCtx Class Reference

```
#include <EvaluationCtx.h>
```

Public Member Functions

- EvaluationCtx (Request ∗request)

5.111.1 Detailed Description

EvaluationCtx, in charge of storing some context information for.

5.111.2 Constructor & Destructor Documentation

5.111.2.1 ArcSec::EvaluationCtx::EvaluationCtx (Request ∗ *request*) `[inline]`

Construct a new EvaluationCtx based on the given request

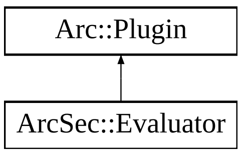
The documentation for this class was generated from the following file:

- EvaluationCtx.h

5.112 ArcSec::Evaluator Class Reference

`#include <Evaluator.h>`

Inheritance diagram for ArcSec::Evaluator:



Public Member Functions

- virtual Response ∗ evaluate (Request ∗request)=0
- virtual Response ∗ evaluate (const Source &request)=0
- virtual Response ∗ evaluate (Request ∗request, const Source &policy)=0
- virtual Response ∗ evaluate (const Source &request, const Source &policy)=0
- virtual Response ∗ evaluate (Request ∗request, Policy ∗policyobj)=0
- virtual Response ∗ evaluate (const Source &request, Policy ∗policyobj)=0
- virtual AttributeFactory ∗ getAttrFactory ()=0
- virtual FnFactory ∗ getFnFactory ()=0
- virtual AlgFactory ∗ getAlgFactory ()=0
- virtual void addPolicy (const Source &policy, const std::string &id="")=0
- virtual void addPolicy (Policy ∗policy, const std::string &id="")=0
- virtual void setCombiningAlg (EvaluatorCombiningAlg alg)=0
- virtual void setCombiningAlg (CombiningAlg ∗alg=NULL)=0
- virtual const char ∗ getName (void) const =0

Protected Member Functions

- virtual Response ∗ evaluate (EvaluationCtx ∗ctx)=0

5.112.1 Detailed Description

Interface for policy evaluation. Execute the policy evaluation, based on the request and policy.

5.112.2 Member Function Documentation

5.112.2.1 virtual void ArcSec::Evaluator::addPolicy (const Source & *policy*, const std::string & *id* = "") `[pure virtual]`

Add policy from specified source to the evaluator. Policy will be marked with id.

5.112.2.2 virtual void ArcSec::Evaluator::addPolicy (Policy ∗ *policy*, const std::string & *id* = "") `[pure virtual]`

Add policy to the evaluator. Policy will be marked with id. The policy object is taken over by this instance and will be destroyed in destructor.

5.112.2.3 virtual Response∗ ArcSec::Evaluator::evaluate (Request ∗ *request*) `[pure virtual]`

Evaluates the request by using a Request object. Evaluation is done till at least one of policies is satisfied.

5.112.2.4 virtual Response∗ ArcSec::Evaluator::evaluate (const Source & *request*) `[pure virtual]`

Evaluates the request by using a specified source

5.112.2.5 virtual Response∗ ArcSec::Evaluator::evaluate (Request ∗ *request*, const Source & *policy*) `[pure virtual]`

Evaluate the specified request against the policy from specified source. In some implementations all of the existing policies inside the evaluator may be destroyed by this method.

5.112.2.6 virtual Response∗ ArcSec::Evaluator::evaluate (const Source & *request*, const Source & *policy*) `[pure virtual]`

Evaluate the request from specified source against the policy from specified source. In some implementations all of the existing policie inside the evaluator may be destroyed by this method.

5.112.2.7 virtual Response∗ ArcSec::Evaluator::evaluate (Request ∗ *request*, Policy ∗ *policyobj*) `[pure virtual]`

Evaluate the specified request against the specified policy. In some implementations all of the existing policy inside the evaluator may be destroyed by this method.

5.112.2.8 virtual Response∗ ArcSec::Evaluator::evaluate (const Source & *request*, Policy ∗ *policyobj*) `[pure virtual]`

Evaluate the request from specified source against the specified policy. In some implementations all of the existing policie inside the evaluator may be destroyed by this method.

5.112.2.9 virtual Response∗ ArcSec::Evaluator::evaluate (EvaluationCtx ∗ *ctx*) `[protected, pure virtual]`

Evaluate the request by using the EvaluationCtx object (which includes the information about request). The ctx is destroyed inside this method (why?!?!?).

5.112.2.10 virtual AlgFactory∗ ArcSec::Evaluator::getAlgFactory ( ) `[pure virtual]`

Get the AlgFactory object

Referenced by ArcSec::EvaluatorContext::operator AlgFactory ∗().

5.112.2.11 virtual AttributeFactory∗ ArcSec::Evaluator::getAttrFactory ( ) `[pure virtual]`

Get the AttributeFactory object

Referenced by ArcSec::EvaluatorContext::operator AttributeFactory ∗().

5.112.2.12 virtual FnFactory∗ ArcSec::Evaluator::getFnFactory ( ) `[pure virtual]`

Get the FnFactory object

Referenced by ArcSec::EvaluatorContext::operator FnFactory ∗().

5.112.2.13 virtual const char∗ ArcSec::Evaluator::getName (void) const [pure virtual]

Get the name of this evaluator

5.112.2.14 virtual void ArcSec::Evaluator::setCombiningAlg (EvaluatorCombiningAlg *alg*) [pure virtual]

Specifies one of simple combining algorithms. In case of multiple policies their results will be combined using this algorithm.

5.112.2.15 virtual void ArcSec::Evaluator::setCombiningAlg (CombiningAlg ∗ *alg* = NULL) [pure virtual]

Specifies loadable combining algorithms. In case of multiple policies their results will be combined using this algorithm. To switch to simple algorithm specify NULL argument.

The documentation for this class was generated from the following file:

- Evaluator.h

5.113 ArcSec::EvaluatorContext Class Reference

```
#include <Evaluator.h>
```

Public Member Functions

- operator AttributeFactory ∗ ()
- operator FnFactory ∗ ()
- operator AlgFactory ∗ ()

5.113.1 Detailed Description

Context for evaluator. It includes the factories which will be used to create related objects.

5.113.2 Member Function Documentation

5.113.2.1 ArcSec::EvaluatorContext::operator AlgFactory ∗ ( ) [inline]

Returns associated AlgFactory object

References ArcSec::Evaluator::getAlgFactory().

5.113.2.2 ArcSec::EvaluatorContext::operator AttributeFactory ∗ ( ) [inline]

Returns associated AttributeFactory object

References ArcSec::Evaluator::getAttrFactory().

5.113.2.3 ArcSec::EvaluatorContext::operator FnFactory ∗ ( ) [inline]

Returns associated FnFactory object

References ArcSec::Evaluator::getFnFactory().

The documentation for this class was generated from the following file:

- Evaluator.h

5.114 ArcSec::EvaluatorLoader Class Reference

```
#include <EvaluatorLoader.h>
```

Public Member Functions

- Evaluator ∗ getEvaluator (const std::string &classname)
- Evaluator ∗ getEvaluator (const Policy ∗policy)
- Evaluator ∗ getEvaluator (const Request ∗request)
- Request ∗ getRequest (const std::string &classname, const Source &request-source)
- Request ∗ getRequest (const Source &requestsource)
- Policy ∗ getPolicy (const std::string &classname, const Source &policysource)
- Policy ∗ getPolicy (const Source &policysource)

5.114.1 Detailed Description

EvaluatorLoader is implemented as a helper class for loading different Evaluator objects, like ArcEvaluator.

The object loading is based on the configuration information about evaluator, including information for factory class, request, policy and evaluator itself

5.114.2 Member Function Documentation

5.114.2.1 Evaluator∗ ArcSec::EvaluatorLoader::getEvaluator (const std::string & *classname*)

Get evaluator object according to the class name

5.114.2.2 Evaluator∗ ArcSec::EvaluatorLoader::getEvaluator (const Policy ∗ *policy*)

Get evaluator object suitable for presented policy

5.114.2.3 Evaluator∗ ArcSec::EvaluatorLoader::getEvaluator (const Request ∗ *request*)

Get evaluator object suitable for presented request

5.114.2.4 Policy∗ ArcSec::EvaluatorLoader::getPolicy (const std::string & *classname,* const Source & *policysource*)

Get policy object according to the class name, based on the policy source

5.114.2.5 Policy∗ ArcSec::EvaluatorLoader::getPolicy (const Source & *policysource*)

Get proper policy object according to the policy source

5.114.2.6 Request∗ ArcSec::EvaluatorLoader::getRequest (const std::string & *classname,* const Source & *requestsource*)

Get request object according to the class name, based on the request source

5.114.2.7 Request∗ ArcSec::EvaluatorLoader::getRequest (const Source & *requestsource*)

Get request object according to the request source

The documentation for this class was generated from the following file:

- EvaluatorLoader.h

5.115 Arc::ExecutableType Class Reference

```
#include <JobDescription.h>
```

Data Fields

- std::string Path
- std::list< std::string > Argument
- std::pair< bool, int > SuccessExitCode

5.115.1 Detailed Description

Executable.

The ExecutableType class is used to specify path to an executable, arguments to pass to it when invoked and the exit code for successful execution.

NOTE: The Name string member has been renamed to Path.

5.115.2 Field Documentation

5.115.2.1 std::list<std::string> Arc::ExecutableType::Argument

List of arguments to executable.

The Argument list is used to specify arguments which should be passed to the executable upon invocation.

5.115.2.2 std::string Arc::ExecutableType::Path

Path to executable.

The Path string should specify the path to an executable. Note that some implementations might only accept a relative path, while others might also accept a absolute one.

5.115.2.3 std::pair<bool, int> Arc::ExecutableType::SuccessExitCode

Exit code at successful execution.

The SuccessExitCode pair is used to specify the exit code returned by the executable in case of successful execution. For some scenarios the exit code returned by the executable should be ignored, which is specified by setting the first member of this object to false. If the exit code should be used for validation at the execution service, the first member of pair must be set to true, while the second member should be the exit code returned at successful execution.

The documentation for this class was generated from the following file:

- JobDescription.h

5.116 Arc::ExecutionTarget Class Reference

```
#include <ExecutionTarget.h>
```

Public Member Functions

- ExecutionTarget ()

- ExecutionTarget (const ExecutionTarget &target)
- ExecutionTarget (const long int addrptr)
- ExecutionTarget & operator= (const ExecutionTarget &target)
- Submitter ∗ GetSubmitter (const UserConfig &ucfg) const
- void Update (const JobDescription &jobdesc)
- void SaveToStream (std::ostream &out, bool longlist) const

Data Fields

- std::string ComputingShareName
- int MaxMainMemory
- int MaxVirtualMemory
- int MaxDiskSpace
- std::map< Period, int > FreeSlotsWithDuration
- Software OperatingSystem
- std::list< ApplicationEnvironment > ApplicationEnvironments

5.116.1 Detailed Description

ExecutionTarget.

This class describe a target which accept computing jobs. All of the members contained in this class, with a few exceptions, are directly linked to attributes defined in the GLUE Specification v. 2.0 (GFD-R-P.147).

5.116.2 Constructor & Destructor Documentation

5.116.2.1 Arc::ExecutionTarget::ExecutionTarget ( )

Create an ExecutionTarget.

Default constructor to create an ExecutionTarget. Takes no arguments.

5.116.2.2 Arc::ExecutionTarget::ExecutionTarget (const **ExecutionTarget** & *target*)

Create an ExecutionTarget.

Copy constructor.

Parameters

target	ExecutionTarget to copy.

5.116.2.3 Arc::ExecutionTarget::ExecutionTarget (const long int *addrptr*)

Create an ExecutionTarget.

Copy constructor? Needed from Python?

Parameters

addrptr	

5.116.3 Member Function Documentation

5.116.3.1 Submitter∗ Arc::ExecutionTarget::GetSubmitter (const UserConfig & *ucfg*) const

Get Submitter to the computing resource represented by the ExecutionTarget.

Method which returns a specialized Submitter which can be used for submitting jobs to the computing resource represented by the ExecutionTarget. In order to return the correct specialized Submitter the GridFlavour variable must be correctly set.

Parameters

ucfg	UserConfig object with paths to user credentials etc.

5.116.3.2 ExecutionTarget& Arc::ExecutionTarget::operator= (const ExecutionTarget & *target*)

Create an ExecutionTarget.

Assignment operator

Parameters

target	is ExecutionTarget to copy.

5.116.3.3 void Arc::ExecutionTarget::SaveToStream (std::ostream & *out*, bool *longlist*) const

Print the ExecutionTarget information to a std::ostream object.

Method to print the ExecutionTarget attributes to a std::ostream object.

Parameters

out	is the std::ostream to print the attributes to.
longlist	should be set to true for printing a long list.

5.116.3.4 void Arc::ExecutionTarget::Update (const JobDescription & *jobdesc*)

Update ExecutionTarget after succesful job submission.

Method to update the ExecutionTarget after a job succesfully has been submitted to the computing resource it represents. E.g. if a job is sent to the computing resource and is expected to enter the queue, then the WaitingJobs attribute is incremented with 1.

Parameters

jobdesc	contains all information about the job submitted.

5.116.4 Field Documentation

5.116.4.1 std::list<ApplicationEnvironment> Arc::ExecutionTarget::ApplicationEnvironments

ApplicationEnvironments.

The ApplicationEnvironments member is a list of ApplicationEnvironment's, defined in section 6.7 GLUE2.

5.116.4.2 std::string Arc::ExecutionTarget::ComputingShareName

ComputingShareName String 0..1.

Human-readable name. This variable represents the ComputingShare.Name attribute of GLUE2.

5.116.4.3 std::map<Period, int> Arc::ExecutionTarget::FreeSlotsWithDuration

FreeSlotsWithDuration std::map<Period, int>

This attribute express the number of free slots with their time limits. The keys in the std::map are the time limit (Period) for the number of free slots stored as the value (int). If no time limit has been specified for a set of free slots then the key will equal Period(LONG_MAX).

5.116.4.4 int Arc::ExecutionTarget::MaxDiskSpace

MaxDiskSpace UInt64 0..1 GB.

The maximum disk space that a job is allowed use in the working; if the limit is hit, then the LRMS MAY kill the job. A negative value specifies that this member is undefined.

5.116.4.5 int Arc::ExecutionTarget::MaxMainMemory

MaxMainMemory UInt64 0..1 MB.

The maximum physical RAM that a job is allowed to use; if the limit is hit, then the LRMS MAY kill the job. A negative value specifies that this member is undefined.

5.116.4.6 int Arc::ExecutionTarget::MaxVirtualMemory

MaxVirtualMemory UInt64 0..1 MB.

The maximum total memory size (RAM plus swap) that a job is allowed to use; if the limit is hit, then the LRMS MAY kill the job. A negative value specifies that this member is undefined.

5.116.4.7 Software Arc::ExecutionTarget::OperatingSystem

OperatingSystem.

The OperatingSystem member is not present in GLUE2 but contains the three GLUE2 attributes OSFamily, OSName and OSVersion.

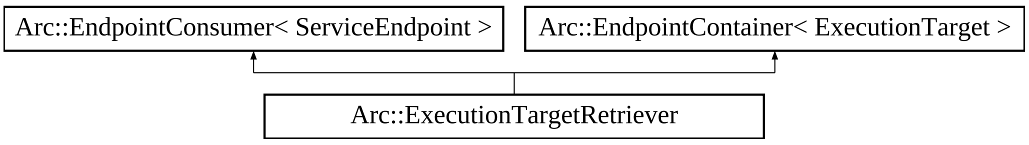
- OSFamily OSFamily_t 1 ∗ The general family to which the Execution Environment operating ∗ system belongs.
- OSName OSName_t 0..1 ∗ The specific name of the operating sytem
- OSVersion String 0..1 ∗ The version of the operating system, as defined by the vendor.

The documentation for this class was generated from the following file:

- ExecutionTarget.h

5.117 Arc::ExecutionTargetRetriever Class Reference

Inheritance diagram for Arc::ExecutionTargetRetriever:


Arc::EndpointConsumer< ServiceEndpoint >
Arc::EndpointContainer< ExecutionTarget >
Arc::ExecutionTargetRetriever

The documentation for this class was generated from the following file:

- EndpointRetriever.h

5.118 Arc::ExpirationReminder Class Reference

```
#include <Counter.h>
```

Public Member Functions

- bool operator< (const ExpirationReminder &other) const
- Glib::TimeVal getExpiryTime () const
- Counter::IDType getReservationID () const

Friends

- class Counter

5.118.1 Detailed Description

A class intended for internal use within counters.

This class is used for "reminder objects" that are used for automatic deallocation of self-expiring reservations.

5.118.2 Member Function Documentation

5.118.2.1 Glib::TimeVal Arc::ExpirationReminder::getExpiryTime ( ) const

Returns the expiry time.

This method returns the expiry time of the reservation that this ExpirationReminder is associated with.

Returns

The expiry time.

5.118.2.2 Counter::IDType Arc::ExpirationReminder::getReservationID ( ) const

Returns the identification number of the reservation.

This method returns the identification number of the self-expiring reservation that this ExpirationReminder is associated with.

Returns

The identification number.

5.118.2.3 bool Arc::ExpirationReminder::operator< (const ExpirationReminder & *other*) const

Less than operator, compares "soonness".

This is the less than operator for the ExpirationReminder class. It compares the priority of such objects with respect to which reservation expires first. It is used when reminder objects are inserted in a priority queue in order to allways place the next reservation to expire at the top.

The documentation for this class was generated from the following file:

- Counter.h

5.119 Arc::FileAccess Class Reference

```
#include <FileAccess.h>
```

Data Structures

- struct header_t

Public Member Functions

- bool ping (void)
- bool setuid (int uid, int gid)
- bool mkdir (const std::string &path, mode_t mode)
- bool mkdirp (const std::string &path, mode_t mode)
- bool link (const std::string &oldpath, const std::string &newpath)
- bool softlink (const std::string &oldpath, const std::string &newpath)
- bool copy (const std::string &oldpath, const std::string &newpath, mode_t mode)
- bool chmod (const std::string &path, mode_t mode)
- bool stat (const std::string &path, struct stat &st)
- bool lstat (const std::string &path, struct stat &st)
- bool fstat (struct stat &st)
- bool ftruncate (off_t length)
- off_t fallocate (off_t length)
- bool readlink (const std::string &path, std::string &linkpath)
- bool remove (const std::string &path)
- bool unlink (const std::string &path)
- bool rmdir (const std::string &path)
- bool rmdirr (const std::string &path)
- bool opendir (const std::string &path)
- bool closedir (void)
- bool readdir (std::string &name)
- bool open (const std::string &path, int flags, mode_t mode)
- bool close (void)
- bool mkstemp (std::string &path, mode_t mode)
- off_t lseek (off_t offset, int whence)
- ssize_t read (void ∗buf, size_t size)

- ssize_t write (const void ∗buf, size_t size)
- ssize_t pread (void ∗buf, size_t size, off_t offset)
- ssize_t pwrite (const void ∗buf, size_t size, off_t offset)
- int geterrno ()
- operator bool (void)
- bool operator! (void)

Static Public Member Functions

- static void testtune (void)

5.119.1 Detailed Description

Defines interface for accessing filesystems.

This class accesses local filesystem through proxy executable which allows to switch user id in multithreaded systems without introducing conflict with other threads. Its methods are mostly replicas of corresponding POSIX functions with some convenience tweaking.

5.119.2 Member Function Documentation

5.119.2.1 bool Arc::FileAccess::copy (const std::string & *oldpath,* const std::string & *newpath,* mode_t *mode*)

Copy file to new location. If new file is created it is assigned secified mode.

5.119.2.2 int Arc::FileAccess::geterrno ( ) [inline]

Get errno of last operation. Every operation resets errno.

5.119.2.3 bool Arc::FileAccess::mkdirp (const std::string & *path,* mode_t *mode*)

Make a directory and assign it specified mode. If missing all intermediate directories are created too.

5.119.2.4 bool Arc::FileAccess::mkstemp (std::string & *path,* mode_t *mode*)

Open new temporary file for writing. On input path contains template of file name ending with XXXXXX. On output path is path to created file.

5.119.2.5 bool Arc::FileAccess::open (const std::string & *path,* int *flags,* mode_t *mode*)

Open file. Only one file may be open at a time.

5.119.2.6 bool Arc::FileAccess::opendir (const std::string & *path*)

Open directory. Only one directory may be open at a time.

5.119.2.7 bool Arc::FileAccess::setuid (int *uid,* int *gid*)

Modify user uid and gid. If any is set to 0 then executable is switched to original uid/gid.

The documentation for this class was generated from the following file:

- FileAccess.h

5.120 Arc::FileLock Class Reference

```
#include <FileLock.h>
```

Public Member Functions

- FileLock (const std::string &filename, unsigned int timeout=DEFAULT_LOCK_T-IMEOUT, bool use_pid=true)
- bool acquire (bool &lock_removed)
- bool acquire ()
- bool release (bool force=false)
- int check (bool log_error=true)

Static Public Member Functions

- static std::string getLockSuffix ()

Static Public Attributes

- static const int DEFAULT_LOCK_TIMEOUT
- static const std::string LOCK_SUFFIX

5.120.1 Detailed Description

A general file locking class.

This class can be used when protected access is required to files which are used by multiple processes or threads. Call acquire() to obtain a lock and release() to release it when finished. check() can be used to verify if a lock is valid for the current process. Locks are independent of FileLock objects - locks are only created and destroyed through acquire() and release(), not on creation or destruction of FileLock objects.

Unless use_pid is set false, the process ID and hostname of the calling process are stored in a file filename.lock in the form pid. This information is used to determine whether a lock is still valid. It is also possible to specify a timeout on the lock.

To ensure an atomic locking operation, acquire() first creates a temporary lock file filename.lock.XXXXXX, then attempts to rename this file to filename.lock. After a successful rename the lock file is checked to make sure the correct process ID and hostname are inside. This eliminates race conditions where multiple processes compete to obtain the lock.

5.120.2 Constructor & Destructor Documentation

5.120.2.1 Arc::FileLock::FileLock (const std::string & *filename*, unsigned int *timeout* = DEFAULT_LOCK_TIMEOUT, bool *use_pid* = `true`)

Create a new FileLock object.

Parameters

filename	The name of the file to be locked
timeout	The timeout of the lock
use_pid	If true, use process id in the lock and to determine lock validity

5.120.3 Member Function Documentation

5.120.3.1 bool Arc::FileLock::acquire (bool & *lock_removed*)

Acquire the lock.

Returns true if the lock was acquired successfully. Locks are acquired if no lock file currently exists, or if the current lock file is invalid. A lock is invalid if the process ID inside the lock no longer exists on the host inside the lock, or the age of the lock file is greater than the lock timeout.

Parameters

lock_-removed	Set to true if an existing lock was removed due to being invalid. In this case the caller may decide to check or delete the file as it is potentially corrupted.

Returns

True if lock is successfully acquired

5.120.3.2 bool Arc::FileLock::acquire ( )

Acquire the lock.

Callers can use this version of acquire() if they do not care whether an invalid lock was removed in the process of obtaining the lock.

5.120.3.3 int Arc::FileLock::check (bool *log_error* = `true`)

Check the lock is valid.

Returns 0 if the lock is valid for the current process, the pid inside the lock if the lock is owned by another process on the same host, and -1 if the lock is owned by another host or any other error occurred. log_error may be set to false to log error messages at INFO level, in cases where the lock not existing or being owned by another host are not errors.

5.120.3.4 bool Arc::FileLock::release (bool *force* = `false`)

Release the lock.

Parameters

force	Remove the lock without checking ownership or timeout

The documentation for this class was generated from the following file:

- FileLock.h

5.121 Arc::FinderLoader Class Reference

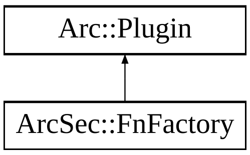
The documentation for this class was generated from the following file:

- FinderLoader.h

5.122 ArcSec::FnFactory Class Reference

```
#include <FnFactory.h>
```

Inheritance diagram for ArcSec::FnFactory:



Public Member Functions

- virtual Function ∗ createFn (const std::string &type)=0

5.122.1 Detailed Description

Interface for function factory class.

FnFactory is in charge of creating Function object according to the algorithm type given as argument of method createFn. This class can be inherited for implementing a factory class which can create some specific Function objects.

5.122.2 Member Function Documentation

5.122.2.1 virtual Function∗ ArcSec::FnFactory::createFn (const std::string & *type*) `[pure virtual]`

creat algorithm object based on the type algorithm type

Parameters

type	The type of Function

Returns

The object of Function

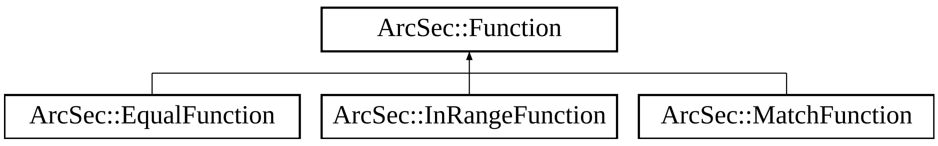
The documentation for this class was generated from the following file:

- FnFactory.h

5.123 ArcSec::Function Class Reference

`#include <Function.h>`

Inheritance diagram for ArcSec::Function:



Public Member Functions

- virtual AttributeValue ∗ evaluate (AttributeValue ∗arg0, AttributeValue ∗arg1, bool check_id=true)=0

- virtual std::list $<$ AttributeValue $*$ $>$ evaluate (std::list$<$ AttributeValue $*$ $>$ args, bool check_id=true)=0

5.123.1 Detailed Description

Interface for function, which is in charge of evaluating two AttributeValue.

5.123.2 Member Function Documentation

5.123.2.1 virtual **AttributeValue**$*$ ArcSec::Function::evaluate (**AttributeValue** $*$ *arg0*, **AttributeValue** $*$ *arg1*, bool *check_id* = `true`) `[pure virtual]`

Evaluate two AttributeValue objects, and return one AttributeValue object

Implemented in ArcSec::EqualFunction, ArcSec::MatchFunction, and ArcSec::InRange-Function.

5.123.2.2 virtual std::list$<$**AttributeValue**$*$$>$ ArcSec::Function::evaluate (std::list$<$ **AttributeValue** $*$ $>$ *args*, bool *check_id* = `true`) `[pure virtual]`

Evaluate a list of AttributeValue objects, and return a list of Attribute objects

Implemented in ArcSec::EqualFunction, ArcSec::MatchFunction, and ArcSec::InRange-Function.

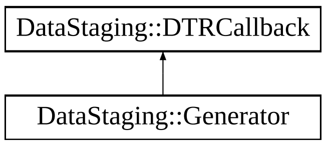
The documentation for this class was generated from the following file:

- Function.h

5.124 DataStaging::Generator Class Reference

```
#include <Generator.h>
```

Inheritance diagram for DataStaging::Generator:



Public Member Functions

- virtual void receiveDTR (DTR_ptr dtr)
- void run (const std::string &source, const std::string &destination)

5.124.1 Detailed Description

Simple Generator implementation.

This Generator implementation is included in the data staging library for for basic direct testing of the library and to show how a Generator can be written. It has one method, run(), which creates a single DTR and submits it to the Scheduler.

5.124.2 Member Function Documentation

5.124.2.1 virtual void DataStaging::Generator::receiveDTR (DTR_ptr *dtr*) `[virtual]`

Implementation of callback from DTRCallback.

Callback method used when DTR processing is complete to pass back to the generator. The DTR is passed by value so that the scheduler can delete its copy of the object after calling this method.

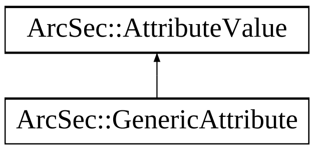
Implements DataStaging::DTRCallback.

The documentation for this class was generated from the following file:

- Generator.h

5.125 ArcSec::GenericAttribute Class Reference

Inheritance diagram for ArcSec::GenericAttribute:



Public Member Functions

- virtual bool equal (AttributeValue ∗other, bool check_id=true)
- virtual std::string encode ()
- virtual std::string getType ()
- virtual std::string getId ()

5.125.1 Member Function Documentation

5.125.1.1 virtual std::string ArcSec::GenericAttribute::encode ( ) `[inline, virtual]`

encode the value in a string format

Implements ArcSec::AttributeValue.

5.125.1.2 virtual bool ArcSec::GenericAttribute::equal (AttributeValue ∗ *value*, bool *check_id* = true) [virtual]

Evluate whether "this" equale to the parameter value

Implements ArcSec::AttributeValue.

5.125.1.3 virtual std::string ArcSec::GenericAttribute::getId ( ) [inline, virtual]

Get the AttributeId of the <Attribute>

Implements ArcSec::AttributeValue.

5.125.1.4 virtual std::string ArcSec::GenericAttribute::getType ( ) [inline, virtual]

Get the DataType of the <Attribute>

Implements ArcSec::AttributeValue.

The documentation for this class was generated from the following file:

- GenericAttribute.h

5.126 Arc::GlobusResult Class Reference

The documentation for this class was generated from the following file:

- GlobusErrorUtils.h

5.127 Arc::GLUE2 Class Reference

```
#include <GLUE2.h>
```

5.127.1 Detailed Description

GLUE2 parser.

This class pparses GLUE2 infromation rendeed in XML and transfers information into various classes representing different types of objects which GLUE2 information model can describe. This parser uses GLUE Specification v. 2.0 (GFD-R-P.147).

The documentation for this class was generated from the following file:

- GLUE2.h

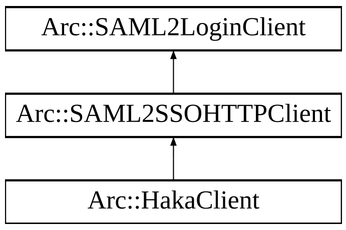
5.128 Arc::GSSCredential Class Reference

The documentation for this class was generated from the following file:

- GSSCredential.h

5.129 Arc::HakaClient Class Reference

Inheritance diagram for Arc::HakaClient:



Protected Member Functions

- MCC_Status processIdPLogin (const std::string username, const std::string password)
- MCC_Status processConsent ()
- MCC_Status processIdP2Confusa ()

5.129.1 Member Function Documentation

5.129.1.1 MCC_Status Arc::HakaClient::processConsent ( ) [protected, virtual]

If the IdP has a consent module and the user has not saved her consent, this method will ask the user for consent to transmission of her data to Confusa

Implements Arc::SAML2SSOHTTPClient.

5.129.1.2 MCC_Status Arc::HakaClient::processIdP2Confusa ( ) [protected, virtual]

Redirects the user back from identity provider to the Confusa SP

Implements Arc::SAML2SSOHTTPClient.

5.129.1.3 MCC_Status Arc::HakaClient::processIdPLogin (const std::string *username,* const std::string *password*) `[protected, virtual]`

Actual identity provider parsers for next three methods implemented in subdirectory idp/

Parse identity provider login page and submit username and password in the previsioned way

Implements Arc::SAML2SSOHTTPClient.

The documentation for this class was generated from the following file:

- HakaClient.h

5.130 Arc::FileAccess::header_t Struct Reference

The documentation for this struct was generated from the following file:

- FileAccess.h

5.131 Arc::HTTPClientInfo Struct Reference

Data Fields

- std::string reason
- uint64_t size
- Time lastModified
- std::string type
- std::list< std::string > cookies
- std::string location

The documentation for this struct was generated from the following file:

- ClientInterface.h

5.132 Arc::InfoCache Class Reference

```
#include <InfoCache.h>
```

Public Member Functions

- InfoCache (const Config &cfg, const std::string &service_id)

5.132.1 Detailed Description

Stores XML document in filesystem split into parts.

5.132.2 Constructor & Destructor Documentation

5.132.2.1 Arc::InfoCache::InfoCache (const Config & *cfg,* const std::string & *service_id*)

Creates object according to configuration (see InfoCacheConfig.xsd)

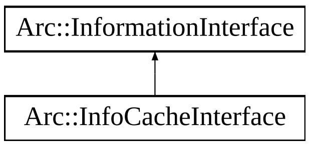
XML configuration is passed in cfg. Argument service_id is used to distiguish between various documents stored under same path - corresponding files will be stored in sub-directory with service_id name.

The documentation for this class was generated from the following file:

- InfoCache.h

5.133 Arc::InfoCacheInterface Class Reference

Inheritance diagram for Arc::InfoCacheInterface:



Protected Member Functions

- virtual void Get (const std::list< std::string > &path, XMLNodeContainer &result)

5.133.1 Member Function Documentation

5.133.1.1 virtual void Arc::InfoCacheInterface::Get (const std::list< std::string > & *path,* XMLNodeContainer & *result*) `[protected, virtual]`

This method is called by this object's Process method. Real implementation of this class should return (sub)tree of XML document. This method may be called multiple times per single Process call. Here is a set on XML element names specifying how to reach requested node(s).

Reimplemented from Arc::InformationInterface.

The documentation for this class was generated from the following file:

- InfoCache.h

5.134 Arc::InfoFilter Class Reference

```
#include <InfoFilter.h>
```

Public Member Functions

- InfoFilter (MessageAuth &id)
- bool Filter (XMLNode doc) const
- bool Filter (XMLNode doc, const InfoFilterPolicies &policies, const NS &ns) const

5.134.1 Detailed Description

Filters information document according to identity of requestor.

Identity is compared to policies stored inside information document and external ones. Parts of document which do not pass policy evaluation are removed.

5.134.2 Constructor & Destructor Documentation

5.134.2.1 Arc::InfoFilter::InfoFilter (**MessageAuth** & *id*)

Creates object and associates identity.

Associated identity is not copied, hence passed argument must not be destroyed while this method is used.

5.134.3 Member Function Documentation

5.134.3.1 bool Arc::InfoFilter::Filter (**XMLNode** *doc*) const

Filter information document according to internal policies.

In provided document all policies and nodes which have their policies evaluated to negative result are removed.

5.134.3.2 bool Arc::InfoFilter::Filter (**XMLNode** *doc,* const InfoFilterPolicies & *policies,* const NS & *ns*) const

Filter information document according to internal and external policies.

In provided document all policies and nodes which have their policies evaluated to negative result are removed. External policies are provided in policies argument. First element of every pair is XPath defining to which XML node policy must be applied. Second element is policy itself. Argument ns defines XML namespaces for XPath evaluation.

The documentation for this class was generated from the following file:

- InfoFilter.h

5.135 Arc::InfoRegister Class Reference

```
#include <InfoRegister.h>
```

5.135.1 Detailed Description

Registration to ISIS interface.

This class represents service registering to Information Indexing Service. It does not perform registration itself. It only collects configuration information. Configuration is as described in InfoRegisterConfig.xsd for element InfoRegistration.

The documentation for this class was generated from the following file:

- InfoRegister.h

5.136 Arc::InfoRegisterContainer Class Reference

```
#include <InfoRegister.h>
```

Public Member Functions

- InfoRegistrar ∗ addRegistrar (XMLNode doc)
- void addService (InfoRegister ∗reg, const std::list< std::string > &ids, XMLNode cfg=XMLNode())
- void removeService (InfoRegister ∗reg)

5.136.1 Detailed Description

Singleton class for scanning configuration and storing refernces to registration elements.

5.136.2 Member Function Documentation

5.136.2.1 InfoRegistrar∗ Arc::InfoRegisterContainer::addRegistrar (XMLNode *doc*)

Adds ISISes to list of handled services.

Supplied configuration document is scanned for InfoRegistrar elements and those are turned into InfoRegistrar classes for handling connection to ISIS service each.

5.136.2.2 void Arc::InfoRegisterContainer::addService (InfoRegister ∗ *reg*, const std::list< std::string > & *ids*, XMLNode *cfg* = XMLNode())

Adds service to list of handled.

This method must be called first time after last addRegistrar was called - services will be only associated with ISISes which are already added. Argument ids contains list of ISIS identifiers to which service is associated. If ids is empty then service is associated to all ISISes currently added. If argument cfg is available and no ISISes are configured then addRegistrars is called with cfg used as configuration document.

5.136.2.3 void Arc::InfoRegisterContainer::removeService (**InfoRegister** ∗ *reg*)

This method must be called if service being destroyed.

The documentation for this class was generated from the following file:

- InfoRegister.h

5.137 Arc::InfoRegisters Class Reference

```
#include <InfoRegister.h>
```

Public Member Functions

- InfoRegisters (XMLNode cfg, Service ∗service)
- bool addRegister (XMLNode cfg, Service ∗service)

5.137.1 Detailed Description

Handling multiple registrations to ISISes.

5.137.2 Constructor & Destructor Documentation

5.137.2.1 Arc::InfoRegisters::InfoRegisters (**XMLNode** *cfg,* **Service** ∗ *service*)

Constructor creates InfoRegister objects according to configuration.

Inside cfg elements InfoRegister are found and for each corresponding InfoRegister object is created. Those objects are destroyed in destructor of this class.

The documentation for this class was generated from the following file:

- InfoRegister.h

5.138 Arc::InfoRegistrar Class Reference

```
#include <InfoRegister.h>
```

Public Member Functions

- void registration (void)
- bool addService (InfoRegister ∗, XMLNode)
- bool removeService (InfoRegister ∗)

5.138.1 Detailed Description

Registration process associated with particular ISIS.

Instance of this class starts thread which takes care passing information about associated services to ISIS service defined in configuration. Configuration is as described in InfoRegister.xsd for element InfoRegistrar.

5.138.2 Member Function Documentation

5.138.2.1 bool Arc::InfoRegistrar::addService (InfoRegister ∗ , XMLNode)

Adds new service to list of handled services.

Service is described by it's InfoRegister object which must be valid as long as this object is functional.

5.138.2.2 void Arc::InfoRegistrar::registration (void)

Performs registartion in a loop.

Never exits unless there is a critical error or requested by destructor.

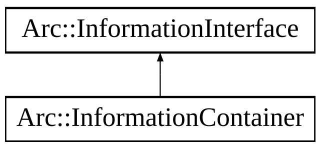
The documentation for this class was generated from the following file:

- InfoRegister.h

5.139 Arc::InformationContainer Class Reference

`#include <InformationInterface.h>`

Inheritance diagram for Arc::InformationContainer:



Public Member Functions

- InformationContainer (XMLNode doc, bool copy=false)
- XMLNode Acquire (void)
- void Assign (XMLNode doc, bool copy=false)

Protected Member Functions

- virtual void Get (const std::list< std::string > &path, XMLNodeContainer &result)

Protected Attributes

- XMLNode doc_

5.139.1 Detailed Description

Information System document container and processor.

This class inherits form InformationInterface and offers container for storing informational XML document.

5.139.2 Constructor & Destructor Documentation

5.139.2.1 Arc::InformationContainer::InformationContainer (XMLNode *doc*, bool *copy* = false)

Creates an instance with XML document . If is true this method makes a copy of for internal use.

5.139.3 Member Function Documentation

5.139.3.1 XMLNode Arc::InformationContainer::Acquire (void)

Get a lock on contained XML document. To be used in multi-threaded environment. Do not forget to release it with Release()

5.139.3.2 void Arc::InformationContainer::Assign (XMLNode *doc*, bool *copy* = false)

Replaces internal XML document with . If is true this method makes a copy of for internal use.

5.139.3.3 virtual void Arc::InformationContainer::Get (const std::list< std::string > & *path*, XMLNodeContainer & *result*) [protected, virtual]

This method is called by this object's Process method. Real implementation of this class should return (sub)tree of XML document. This method may be called multiple times per single Process call. Here is a set on XML element names specifying how to reach requested node(s).

Reimplemented from Arc::InformationInterface.

5.139.4 Field Documentation

5.139.4.1 XMLNode Arc::InformationContainer::doc_ [protected]

Either link or container of XML document

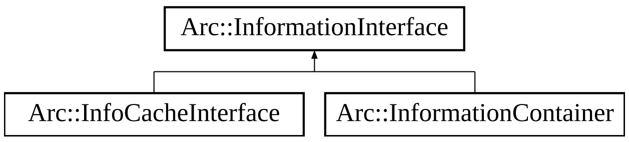
The documentation for this class was generated from the following file:

- InformationInterface.h

5.140 Arc::InformationInterface Class Reference

`#include <InformationInterface.h>`

Inheritance diagram for Arc::InformationInterface:



Public Member Functions

- InformationInterface (bool safe=true)

Protected Member Functions

- virtual void Get (const std::list< std::string > &path, XMLNodeContainer &result)

Protected Attributes

- Glib::Mutex lock_

5.140.1 Detailed Description

Information System message processor.

This class provides callback for 2 operations of WS-ResourceProperties and convenient parsing/generation of corresponding SOAP mesages. In a future it may extend range of supported specifications.

5.140.2 Constructor & Destructor Documentation

5.140.2.1 Arc::InformationInterface::InformationInterface (bool *safe* = `true`)

Constructor. If 'safe' is true all calls to Get will be locked.

5.140.3 Member Function Documentation

5.140.3.1 virtual void Arc::InformationInterface::Get (const std::list< std::string > & *path*, XMLNodeContainer & *result*) `[protected, virtual]`

This method is called by this object's Process method. Real implementation of this class should return (sub)tree of XML document. This method may be called multiple times per single Process call. Here is a set on XML element names specifying how to reach requested node(s).

Reimplemented in Arc::InformationContainer, and Arc::InfoCacheInterface.

5.140.4 Field Documentation

5.140.4.1 Glib::Mutex Arc::InformationInterface::lock_ `[protected]`

Mutex used to protect access to Get methods in multi-threaded env.

The documentation for this class was generated from the following file:

- InformationInterface.h

5.141 Arc::InformationRequest Class Reference

```
#include <InformationInterface.h>
```

Public Member Functions

- InformationRequest (void)
- InformationRequest (const std::list< std::string > &path)
- InformationRequest (const std::list< std::list< std::string > > &paths)

- InformationRequest (XMLNode query)
- SOAPEnvelope ∗ SOAP (void)

5.141.1 Detailed Description

Request for information in InfoSystem.

This is a convenience wrapper creating proper WS-ResourceProperties request targeted InfoSystem interface of service.

5.141.2 Constructor & Destructor Documentation

5.141.2.1 Arc::InformationRequest::InformationRequest (void)

Dummy constructor

5.141.2.2 Arc::InformationRequest::InformationRequest (const std::list< std::string > & *path*)

Request for attribute specified by elements of path. Currently only first element is used.

5.141.2.3 Arc::InformationRequest::InformationRequest (const std::list< std::list< std::string > > & *paths*)

Request for attribute specified by elements of paths. Currently only first element of every path is used.

5.141.2.4 Arc::InformationRequest::InformationRequest (XMLNode *query*)

Request for attributes specified by XPath query.

5.141.3 Member Function Documentation

5.141.3.1 SOAPEnvelope∗ Arc::InformationRequest::SOAP (void)

Returns generated SOAP message

The documentation for this class was generated from the following file:

- InformationInterface.h

5.142 Arc::InformationResponse Class Reference

```
#include <InformationInterface.h>
```

Public Member Functions

- InformationResponse (SOAPEnvelope &soap)
- std::list< XMLNode > Result (void)

5.142.1 Detailed Description

Informational response from InfoSystem.

This is a convenience wrapper analyzing WS-ResourceProperties response from InfoSystem interface of service.

5.142.2 Constructor & Destructor Documentation

5.142.2.1 Arc::InformationResponse::InformationResponse (SOAPEnvelope & *soap*)

Constructor parses WS-ResourceProperties ressponse. Provided SOAPEnvelope object must be valid as long as this object is in use.

5.142.3 Member Function Documentation

5.142.3.1 std::list<**XMLNode**> Arc::InformationResponse::Result (void)

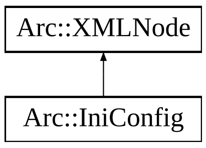
Returns set of attributes which were in SOAP message passed to constructor.

The documentation for this class was generated from the following file:

- InformationInterface.h

5.143 Arc::IniConfig Class Reference

Inheritance diagram for Arc::IniConfig:



The documentation for this class was generated from the following file:

- IniConfig.h

5.144 Arc::initializeCredentialsType Class Reference

```
#include <UserConfig.h>
```

5.144.1 Detailed Description

Defines how user credentials are looked for.

For complete information see description of UserConfig::InitializeCredentials(initialize-Credentials) method.

The documentation for this class was generated from the following file:

- UserConfig.h

5.145 Arc::InputFileType Class Reference

Data Fields

- std::string Checksum

5.145.1 Field Documentation

5.145.1.1 std::string **Arc::InputFileType::Checksum**

MD5 checksum of file.

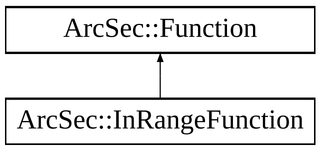
The Checksum attribute specifies the textural representation of MD5 checksum of file in base 16.

The documentation for this class was generated from the following file:

- JobDescription.h

5.146 ArcSec::InRangeFunction Class Reference

Inheritance diagram for ArcSec::InRangeFunction:



Public Member Functions

- virtual AttributeValue ∗ evaluate (AttributeValue ∗arg0, AttributeValue ∗arg1, bool check_id=true)
- virtual std::list < AttributeValue ∗ > evaluate (std::list< AttributeValue ∗ > args, bool check_id=true)

5.146.1 Member Function Documentation

5.146.1.1 virtual **AttributeValue**∗ ArcSec::InRangeFunction::evaluate (**AttributeValue** ∗ *arg0*, **AttributeValue** ∗ *arg1*, bool *check_id* = `true`) `[virtual]`

Evaluate two AttributeValue objects, and return one AttributeValue object

Implements ArcSec::Function.

5.146.1.2 virtual std::list<**AttributeValue**∗> ArcSec::InRangeFunction::evaluate (std::list< **AttributeValue** ∗ > *args*, bool *check_id* = `true`) `[virtual]`

Evaluate a list of AttributeValue objects, and return a list of Attribute objects

Implements ArcSec::Function.

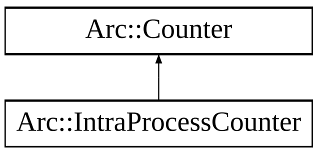
The documentation for this class was generated from the following file:

- InRangeFunction.h

5.147 Arc::IntraProcessCounter Class Reference

`#include <IntraProcessCounter.h>`

Inheritance diagram for Arc::IntraProcessCounter:



Public Member Functions

- IntraProcessCounter (int limit, int excess)
- virtual ∼IntraProcessCounter ()
- virtual int getLimit ()
- virtual int setLimit (int newLimit)
- virtual int changeLimit (int amount)

- virtual int getExcess ()
- virtual int setExcess (int newExcess)
- virtual int changeExcess (int amount)
- virtual int getValue ()
- virtual CounterTicket reserve (int amount=1, Glib::TimeVal duration=ETERNAL, bool prioritized=false, Glib::TimeVal timeOut=ETERNAL)

Protected Member Functions

- virtual void cancel (IDType reservationID)
- virtual void extend (IDType &reservationID, Glib::TimeVal &expiryTime, Glib::-TimeVal duration=ETERNAL)

5.147.1 Detailed Description

A class for counters used by threads within a single process.

This is a class for shared among different threads within a single process. See the Counter class for further information about counters and examples of usage.

5.147.2 Constructor & Destructor Documentation

5.147.2.1 Arc::IntraProcessCounter::IntraProcessCounter (int *limit,* int *excess*)

Creates an IntraProcessCounter with specified limit and excess.

This constructor creates a counter with the specified limit (amount of resources available for reservation) and excess limit (an extra amount of resources that may be used for prioritized reservations).

Parameters

limit	The limit of the counter.
excess	The excess limit of the counter.

5.147.2.2 virtual Arc::IntraProcessCounter::∼IntraProcessCounter ( ) [virtual]

Destructor.

This is the destructor of the IntraProcessCounter class. Does not need to do anything.

5.147.3 Member Function Documentation

5.147.3.1 virtual void Arc::IntraProcessCounter::cancel (IDType *reservationID*) [protected, virtual]

Cancellation of a reservation.

This method cancels a reservation. It is called by the CounterTicket that corresponds to the reservation.

Parameters

reservationI-D	The identity number (key) of the reservation to cancel.

Implements Arc::Counter.

5.147.3.2 virtual int Arc::IntraProcessCounter::changeExcess (int *amount*) [virtual]

Changes the excess limit of the counter.

Changes the excess limit of the counter by adding a certain amount to the current excess limit.

Parameters

amount	The amount by which to change the excess limit.

Returns

The new excess limit.

Implements Arc::Counter.

5.147.3.3 virtual int Arc::IntraProcessCounter::changeLimit (int *amount*) [virtual]

Changes the limit of the counter.

Changes the limit of the counter by adding a certain amount to the current limit.

Parameters

amount	The amount by which to change the limit.

Returns

The new limit.

Implements Arc::Counter.

5.147.3.4 virtual void Arc::IntraProcessCounter::extend (IDType & *reservationID*, Glib::TimeVal & *expiryTime*, Glib::TimeVal *duration* = ETERNAL) `[protected, virtual]`

Extension of a reservation.

This method extends a reservation. It is called by the CounterTicket that corresponds to the reservation.

Parameters

reservationID	Used for input as well as output. Contains the identification number of the original reservation on entry and the new identification number of the extended reservation on exit.
expiryTime	Used for input as well as output. Contains the expiry time of the original reservation on entry and the new expiry time of the extended reservation on exit.
duration	The time by which to extend the reservation. The new expiration time is computed based on the current time, NOT the previous expiration time.

Implements Arc::Counter.

5.147.3.5 virtual int Arc::IntraProcessCounter::getExcess ( ) `[virtual]`

Returns the excess limit of the counter.

Returns the excess limit of the counter, i.e. by how much the usual limit may be exceeded by prioritized reservations.

Returns

The excess limit.

Implements Arc::Counter.

5.147.3.6 virtual int Arc::IntraProcessCounter::getLimit ( ) `[virtual]`

Returns the current limit of the counter.

This method returns the current limit of the counter, i.e. how many units can be reserved simultaneously by different threads without claiming high priority.

Returns

The current limit of the counter.

Implements Arc::Counter.

5.147.3.7 virtual int Arc::IntraProcessCounter::getValue ( ) `[virtual]`

Returns the current value of the counter.

Returns the current value of the counter, i.e. the number of unreserved units. Initially, the value is equal to the limit of the counter. When a reservation is made, the the value is decreased. Normally, the value should never be negative, but this may happen if there are prioritized reservations. It can also happen if the limit is decreased after some reservations have been made, since reservations are never revoked.

Returns

The current value of the counter.

Implements Arc::Counter.

5.147.3.8 virtual **CounterTicket** Arc::IntraProcessCounter::reserve (int *amount* = `1`, Glib::TimeVal *duration* = **ETERNAL**, bool *prioritized* = `false`, Glib::TimeVal *timeOut* = **ETERNAL**) `[virtual]`

Makes a reservation from the counter.

This method makes a reservation from the counter. If the current value of the counter is too low to allow for the reservation, the method blocks until the reservation is possible or times out.

Parameters

amount	The amount to reserve, default value is 1.
duration	The duration of a self expiring reservation, default is that it lasts forever.
prioritized	Whether this reservation is prioritized and thus allowed to use the excess limit.
timeOut	The maximum time to block if the value of the counter is too low, default is to allow "eternal" blocking.

Returns

A CounterTicket that can be queried about the status of the reservation as well as for cancellations and extensions.

Implements Arc::Counter.

5.147.3.9 virtual int Arc::IntraProcessCounter::setExcess (int *newExcess*) `[virtual]`

Sets the excess limit of the counter.

This method sets a new excess limit for the counter.

Parameters

newExcess	The new excess limit, an absolute number.

Returns

The new excess limit.

Implements Arc::Counter.

5.147.3.10 virtual int Arc::IntraProcessCounter::setLimit (int *newLimit*) [virtual]

Sets the limit of the counter.

This method sets a new limit for the counter.

Parameters

newLimit	The new limit, an absolute number.

Returns

The new limit.

Implements Arc::Counter.

The documentation for this class was generated from the following file:

- IntraProcessCounter.h

5.148 Arc::ISIS_description Struct Reference

The documentation for this struct was generated from the following file:

- InfoRegister.h

5.149 Arc::IString Class Reference

The documentation for this class was generated from the following file:

- IString.h

5.150 Arc::JobDescriptionParserLoader::iterator Class Reference

The documentation for this class was generated from the following file:

- JobDescriptionParser.h

5.151 Arc::Job Class Reference

```
#include <Job.h>
```

Public Member Functions

- Job ()
- void SaveToStream (std::ostream &out, bool longlist) const
- Job & operator= (XMLNode job)
- void ToXML (XMLNode job) const

Static Public Member Functions

- static bool ReadAllJobsFromFile (const std::string &filename, std::list< Job > &jobs, unsigned nTries=10, unsigned tryInterval=500000)
- static bool ReadJobsFromFile (const std::string &filename, std::list< Job > &jobs, std::list< std::string > &jobIdentifiers, bool all=false, const std::list< std::string > &endpoints=std::list< std::string >(), const std::list< std::string > &rejectEndpoints=std::list< std::string >(), unsigned nTries=10, unsigned tryInterval=500000)
- static bool WriteJobsToTruncatedFile (const std::string &filename, const std::list< Job > &jobs, unsigned nTries=10, unsigned tryInterval=500000)
- static bool WriteJobsToFile (const std::string &filename, const std::list< Job > &jobs, unsigned nTries=10, unsigned tryInterval=500000)
- static bool WriteJobsToFile (const std::string &filename, const std::list< Job > &jobs, std::list< const Job * > &newJobs, unsigned nTries=10, unsigned tryInterval=500000)
- static bool RemoveJobsFromFile (const std::string &filename, const std::list< URL > &jobids, unsigned nTries=10, unsigned tryInterval=500000)
- static bool ReadJobIDsFromFile (const std::string &filename, std::list< std::string > &jobids, unsigned nTries=10, unsigned tryInterval=500000)
- static bool WriteJobIDToFile (const URL &jobid, const std::string &filename, unsigned nTries=10, unsigned tryInterval=500000)
- static bool WriteJobIDsToFile (const std::list< URL > &jobids, const std::string &filename, unsigned nTries=10, unsigned tryInterval=500000)

5.151.1 Detailed Description

Job.

This class describe a Grid job. Most of the members contained in this class are directly linked to the ComputingActivity defined in the GLUE Specification v. 2.0 (GFD-R-P.147).

5.151.2 Constructor & Destructor Documentation

5.151.2.1 Arc::Job::Job ( )

Create a Job object.

Default constructor. Takes no arguments.

5.151.3 Member Function Documentation

5.151.3.1 Job& Arc::Job::operator= (XMLNode *job*)

Set Job attributes from a XMLNode.

The attributes of the Job object is set to the values specified in the XMLNode. - The XMLNode should be a ComputingActivity type using the GLUE2 XML hierarchical rendering, see `http://forge.gridforum.org/sf/wiki/do/viewPage/projects.glue-wg/wiki/GLUE2XMLSchema` for more information. - Note that associations are not parsed.

Parameters

job	is a XMLNode of GLUE2 ComputingActivity type.

See also

ToXML

5.151.3.2 static bool Arc::Job::ReadAllJobsFromFile (const std::string & *filename*, std::list< Job > & *jobs*, unsigned *nTries* = 10, unsigned *tryInterval* = 500000) [static]

Read all jobs from file.

This static method will read jobs (in XML format) from the specified file, and they will be stored in the referenced list of jobs. The XML element in the file representing a job should be named "Job", and have the same format as accepted by the operator=(XMLNode) method.

File locking: To avoid simultaneous use (writing and reading) of the file, reading will not be initiated before a lock on the file has been acquired. For this purpose the FileLock class is used. nTries specifies the maximal number of times the method will try to acquire a lock on the file, with an interval of tryInterval micro seconds between each attempt. If a lock is not acquired∗ this method returns false.

The method will also return false if the content of file is not in XML format. Otherwise it returns true.

Parameters

filename	is the filename of the job list to read jobs from.
jobs	is a reference to a list of Job objects, which will be filled with the jobs read from file (cleared before use).
nTries	specifies the maximal number of times the method will try to acquire a lock on file to read.
tryInterval	specifies the interval (in micro seconds) between each attempt to acquire a lock.

Returns

true in case of success, otherwise false.

See also

operator=(XMLNode)
ReadJobsFromFile
WriteJobsToTruncatedFile
WriteJobsToFile
RemoveJobsFromFile
FileLock
XMLNode::ReadFromFile

5.151.3.3 static bool Arc::Job::ReadJobIDsFromFile (const std::string & *filename*, std::list< std::string > & *jobids*, unsigned *nTries* = `10`, unsigned *tryInterval* = `500000`) `[static]`

Read a list of Job IDs from a file, and append them to a list.

This static method will read job IDs from the given file, and append the strings to the string list given as parameter. File locking will be done as described for the ReadAllJobsFromFile method. It returns false if the file was not readable, true otherwise, even if there were no IDs in the file. The lines of the file will be trimmed, and lines starting with # will be ignored.

Parameters

filename	is the filename of the jobidfile
jobids	is a list of strings, to which the IDs read from the file will be appended
nTries	specifies the maximal number of times the method will try to acquire a lock on file to read.
tryInterval	specifies the interval (in micro seconds) between each attempt to acquire a lock.

Returns

true in case of success, otherwise false.

5.151.3.4 static bool Arc::Job::ReadJobsFromFile (const std::string & *filename*, std::list< Job > & *jobs*, std::list< std::string > & *jobIdentifiers*, bool *all* = `false`, const std::list< std::string > & *endpoints* = `std::list< std::string >()`, const std::list< std::string > & *rejectEndpoints* = `std::list< std::string >()`, unsigned *nTries* = `10`, unsigned *tryInterval* = `500000`) `[static]`

Read specified jobs from file.

Extract job information for jobs specified by job identifiers and/or endpoints from job list file. The method read all jobs from specified job list file, using the ReadAllJobsFromFile method. If the all argument is false, jobs will only be put into the list of Job objects (jobs) if the IDFromEndpoint or Name attributes of the Job object matches one of the entries in the jobIdentifiers list argument or if the Cluster or InfoEndpoint attributes of the Job object matches one of the entries in the endpoints list argument (if specified), using the URL::StringMatches method. If the all argument is true, none of those matchings is carried out, instead all jobs are put into the list of Job objects. For both values of the all argument, the entries in the jobIdentifiers list will be removed if corresponding to a job in the jobs list. In the end, if the rejectEndpoints list is non-empty, the jobs list will be filtered by removing Job objects for which the Cluster or InfoEndpoint attributes matches those in the rejectEndpoints list, using the URL::StringMatches method. This method returns true, except when the ReadAllJobsFromFile method returns false.

Parameters

filename	is the filename of the job list to read jobs from.
jobs	is a reference to a list of Job objects, which will be filled with the jobs read from file (cleared before use).
jobIdentifiers	specifies the job IDs and names of jobs to be put into the jobs list. - Entries in this list is removed if found among the jobs in the job list file.
all	specifies whether all jobs from the jobs list should be put into the jobs list.
endpoints	is a list of strings resembling endpoints for which Job objects having matching Cluster or InfoEndpoint attributes should be added to the jobs list.
reject-Endpoints	is a list of strings resembling endpoint for which Job objects having matching Cluster or InfoEndpoint attributes should be removed from the jobs list. Overides jobIdentifiers, all and endpoints.
nTries	will be passed to the ReadAllJobsFromFile method
tryInterval	will be passed to the ReadAllJobsFromFile method

Returns

true in case of success, otherwise false.

See also

ReadAllJobsFromFile
URL::StringMatches
WriteJobsToTruncatedFile

WriteJobsToFile
RemoveJobsFromFile

5.151.3.5 static bool Arc::Job::RemoveJobsFromFile (const std::string & *filename*, const std::list< URL > & *jobids*, unsigned *nTries* = `10`, unsigned *tryInterval* = `500000`) `[static]`

Remove job from file.

This static method will remove the jobs having IDFromEndpoint identical to any of those in the passed list jobids. File locking will be done as described for the ReadAllJobs-FromFile method. The method will return false if reading from or writing jobs to the file fails. Otherwise it returns true.

Parameters

filename	is the filename of the job list to write jobs to.
jobids	is a list of URL objects which specifies which jobs from the file to remove.
nTries	specifies the maximal number of times the method will try to acquire a lock on file to read.
tryInterval	specifies the interval (in micro seconds) between each attempt to acquire a lock.

Returns

true in case of success, otherwise false.

See also

ReadAllJobsFromFile
WriteJobsToTruncatedFile
WriteJobsToFile
FileLock
XMLNode::ReadFromFile
XMLNode::SaveToFile

5.151.3.6 void Arc::Job::SaveToStream (std::ostream & *out*, bool *longlist*) const

Write job information to a std::ostream object.

This method will write job information to the passed std::ostream object. The longlist boolean specifies whether more (true) or less (false) information should be printed.

Parameters

out	is the std::ostream object to print the attributes to.
longlist	is a boolean for switching on long listing (more details).

5.151.3.7 void Arc::Job::ToXML (XMLNode *job*) const

Add job information to a XMLNode.

Child nodes of GLUE ComputingActivity type containing job information of this object will be added to the passed XMLNode.

Parameters

job	is the XMLNode to add job information to in form of GLUE2 Computing-Activity type child nodes.

See also

operator=

5.151.3.8 static bool Arc::Job::WriteJobIDsToFile (const std::list< URL > & *jobids*, const std::string & *filename*, unsigned *nTries* = `10`, unsigned *tryInterval* = `500000`) `[static]`

Append list of URLs to a file.

This static method will put the ID given as a string, and append it to the given file. File locking will be done as described for the ReadAllJobsFromFile method. It returns false if the file was not writable, true otherwise.

Parameters

jobid	is a list of URL objects to be written to file
filename	is the filename of file, where the URL objects will be appended to.
nTries	specifies the maximal number of times the method will try to acquire a lock on file to read.
tryInterval	specifies the interval (in micro seconds) between each attempt to acquire a lock.

Returns

true in case of success, otherwise false.

5.151.3.9 static bool Arc::Job::WriteJobIDToFile (const URL & *jobid*, const std::string & *filename*, unsigned *nTries* = `10`, unsigned *tryInterval* = `500000`) `[static]`

Append a jobID to a file.

This static method will put the ID represented by a URL object, and append it to the given file. File locking will be done as described for the ReadAllJobsFromFile method. It returns false if the file is not writable, true otherwise.

Parameters

jobid	is a jobID as a URL object
filename	is the filename of the jobidfile, where the jobID will be appended
nTries	specifies the maximal number of times the method will try to acquire a lock on file to read.
tryInterval	specifies the interval (in micro seconds) between each attempt to acquire a lock.

Returns

true in case of success, otherwise false.

5.151.3.10 static bool Arc::Job::WriteJobsToFile (const std::string & *filename*, const std::list< Job > & *jobs*, unsigned *nTries* = `10`, unsigned *tryInterval* = `500000`) `[static]`

Write jobs to file.

This method is in all respects identical to the WriteJobsToFile(const std::string&, const std::list<Job>&, std::list<const Job∗>&, unsigned, unsigned) method, except for the information about new jobs which is disregarded.

See also

WriteJobsToFile(const std::string&, const std::list<Job>&, std::list<const Job∗>&, unsigned, unsigned)

5.151.3.11 static bool Arc::Job::WriteJobsToFile (const std::string & *filename*, const std::list< Job > & *jobs*, std::list< const Job ∗ > & *newJobs*, unsigned *nTries* = `10`, unsigned *tryInterval* = `500000`) `[static]`

Write jobs to file.

This static method will write (append) the passed list of jobs to the specified file. Jobs will be written in XML format as returned by the ToXML method, and each job will be contained in a element named "Job". If the passed list of jobs contains two identical jobs (i.e. IDFromEndpoint identical), only the latter Job object is stored. If a job in the list is identical to one in file, the one in file will be replaced with the one from the list. A pointer (no memory allocation) to those jobs from the list which are not in the file will be added to the newJobs list, thus these pointers goes out of scope when 'jobs' list goes out of scope. File locking will be done as described for the ReadAllJobsFromFile method. The method will return false if writing jobs to the file fails. Otherwise it returns true.

Parameters

filename	is the filename of the job list to write jobs to.
jobs	is the list of Job objects which should be written to file.
newJobs	is a reference to a list of pointers to Job objects which are not duplicates.

nTries	specifies the maximal number of times the method will try to acquire a lock on file to read.
tryInterval	specifies the interval (in micro seconds) between each attempt to acquire a lock.

Returns

true in case of success, otherwise false.

See also

ToXML
ReadAllJobsFromFile
WriteJobsToTruncatedFile
RemoveJobsFromFile
FileLock
XMLNode::SaveToFile

5.151.3.12 static bool Arc::Job::WriteJobsToTruncatedFile (const std::string & *filename*, const std::list< Job > & *jobs*, unsigned *nTries* = `10`, unsigned *tryInterval* = `500000`) `[static]`

Truncate file and write jobs to it.

This static method will write the passed list of jobs to the specified file, but before writing the file will be truncated. Jobs will be written in XML format as returned by the ToXML method, and each job will be contained in a element named "Job". If the passed list of jobs contains two identical jobs (i.e. IDFromEndpoint identical), only the latter Job object is stored. File locking will be done as described for the ReadAllJobsFromFile method. The method will return false if writing jobs to the file fails. Otherwise it returns true.

Parameters

filename	is the filename of the job list to write jobs to.
jobs	is the list of Job objects which should be written to file.
nTries	specifies the maximal number of times the method will try to acquire a lock on file to read.
tryInterval	specifies the interval (in micro seconds) between each attempt to acquire a lock.

Returns

true in case of success, otherwise false.

See also

ToXML
ReadAllJobsFromFile
WriteJobsToFile
RemoveJobsFromFile
FileLock
XMLNode::SaveToFile

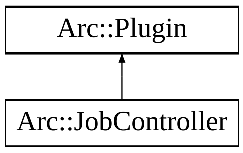
The documentation for this class was generated from the following file:

- Job.h

5.152 Arc::JobController Class Reference

```
#include <JobController.h>
```

Inheritance diagram for Arc::JobController:



5.152.1 Detailed Description

Base class for the JobControllers.

The JobController is the base class for middleware specialized derived classes. The JobController base class is also the implementer of all public functionality that should be offered by the middleware specific specializations. In other words all virtual functions of the JobController are private. The initialization of a (specialized) JobController object takes two steps. First the JobController specialization for the required grid flavour must be loaded by the JobControllerLoader, which sees to that the JobController receives information about its Grid flavour and the local joblist file containing information about all active jobs (flavour independent). The next step is the filling of the JobController job pool (JobStore) which is the pool of jobs that the JobController can manage. Must be specialiced for each supported middleware flavour.

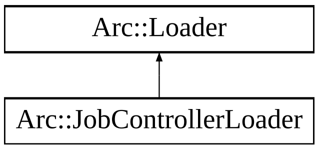
The documentation for this class was generated from the following file:

- JobController.h

5.153 Arc::JobControllerLoader Class Reference

```
#include <JobController.h>
```

Inheritance diagram for Arc::JobControllerLoader:



Public Member Functions

- JobControllerLoader ()
- ∼JobControllerLoader ()
- JobController ∗ load (const std::string &name, const UserConfig &usercfg)
- const std::list< JobController ∗ > & GetJobControllers () const

5.153.1 Detailed Description

Class responsible for loading JobController plugins The JobController objects returned by a JobControllerLoader must not be used after the JobControllerLoader goes out of scope.

5.153.2 Constructor & Destructor Documentation

5.153.2.1 Arc::JobControllerLoader::JobControllerLoader ( )

Constructor Creates a new JobControllerLoader.

5.153.2.2 Arc::JobControllerLoader::∼JobControllerLoader ( )

Destructor Calling the destructor destroys all JobControllers loaded by the JobControllerLoader instance.

5.153.3 Member Function Documentation

5.153.3.1 const std::list<JobController∗>& Arc::JobControllerLoader::GetJobControllers ( ) const [inline]

Retrieve the list of loaded JobControllers.

Returns

A reference to the list of JobControllers.

Referenced by Arc::JobSupervisor::GetJobControllers().

5.153.3.2 JobController∗ Arc::JobControllerLoader::load (const std::string & *name*, const UserConfig & *usercfg*)

Load a new JobController

Parameters

name	The name of the JobController to load.
usercfg	The UserConfig object for the new JobController.

Returns

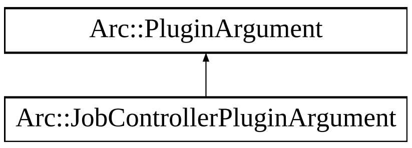
A pointer to the new JobController (NULL on error).

The documentation for this class was generated from the following file:

- JobController.h

5.154 Arc::JobControllerPluginArgument Class Reference

Inheritance diagram for Arc::JobControllerPluginArgument:



The documentation for this class was generated from the following file:

- JobController.h

5.155 Arc::JobControllerTestACCControl Class Reference

The documentation for this class was generated from the following file:

- TestACCControl.h

5.156 Arc::JobDescription Class Reference

```
#include <JobDescription.h>
```

Public Member Functions

- JobDescriptionResult UnParse (std::string &product, std::string language, const std::string &dialect="") const
- const std::string & GetSourceLanguage () const
- JobDescriptionResult SaveToStream (std::ostream &out, const std::string &format) const
- bool Prepare (const ExecutionTarget &et)

Static Public Member Functions

- static JobDescriptionResult Parse (const std::string &source, std::list< JobDescription > &jobdescs, const std::string &language="", const std::string &dialect="")

Data Fields

- std::map< std::string, std::string > OtherAttributes

5.156.1 Detailed Description

The JobDescription class is the internal representation of a job description in the ARC-lib. It is structured into a number of other classes/objects which should strictly follow the description given in the job description document <`http://svn.nordugrid.org/trac/nordugrid/browser/arc1/trunk/doc/tech_doc/client/job_description.odt`>.

The class consist of a parsing method JobDescription::Parse which tries to parse the passed source using a number of different parsers. The parser method is complemented by the JobDescription::UnParse method, a method to generate a job description document in one of the supported formats. Additionally the internal representation is contained in public members which makes it directly accessible and modifiable from outside the scope of the class.

5.156.2 Member Function Documentation

5.156.2.1 const std::string& Arc::JobDescription::GetSourceLanguage ( ) const [inline]

Get input source language.

If this object was created by a JobDescriptionParser, then this method returns a string which indicates the job description language of the parsed source. If not created by a JobDescripionParser the string returned is empty.

Returns

const std::string& source langauge of parsed input source.

5.156.2.2 static **JobDescriptionResult** Arc::JobDescription::Parse (const std::string & *source*, std::list< **JobDescription** > & *jobdescs*, const std::string & *language* = "", const std::string & *dialect* = "") `[static]`

Parse string into JobDescription objects.

The passed string will be tried parsed into the list of JobDescription objects. The available specialized JobDesciptionParser classes will be tried one by one, parsing the string, and if one succeeds the list of JobDescription objects is filled with the parsed contents and true is returned, otherwise false is returned. If no language specified, each JobDescriptionParser will try all its supported languages. On the other hand if a language is specified, only the JobDescriptionParser supporting that language will be tried. A dialect can also be specified, which only has an effect on the parsing if the JobDescriptionParser supports that dialect.

Parameters

source	
jobdescs	
language	
dialect	

Returns

true if the passed string can be parsed successfully by any of the available parsers.

5.156.2.3 bool Arc::JobDescription::Prepare (const **ExecutionTarget** & *et*)

Prepare for submission to target.

The Prepare method, is used to check and adapt the JobDescription object to the passed ExecutionTarget object before submitting the job description to the target. -This method is normally called by Submitter plugin classes, before submitting the job description. First the method checks the DataStaging.InputFiles list, for identical file names, and non-existent local input files. If any of such files are found, the method returns false. Then if the Application.Executable and Application.Input objects are specified as local input files, and they are not among the files in the -DataStaging.InputFiles list a existence check will be done and if not found, false will be returned, otherwise they will be added to the list. Likewise if the Application.-Output, Application.Error and Application.LogDir attributes have been specified, and is not among the files in the DataStaging.OutputFiles list, they will be added to this list. After the file check, the Resources.RunTimeEnvironment, Resources.C-EType and Resources.OperatingSystem SoftwareRequirement objects are respectively resolved against the ExecutionTarget::ApplicationEnvironments, ExecutionTarget-::Implementation and ExecutionTarget::OperatingSystem Software objects using the -SoftwareRequirement::selectSoftware method. If that method returns false i.e. unable to resolve the requirements false will be returned. After resolving software requirements, the value of the Resources.QueueName attribute will be set to that of the Execution-Target::ComputingShareName attribute, and then true is returned.

Parameters

et	ExecutionTarget object which to resolve software requirements against, and to pick up queue name from.

Returns

false is returned is file checks fails, or if unable to resolve software requirements.

5.156.2.4 JobDescriptionResult Arc::JobDescription::SaveToStream (std::ostream & *out*, const std::string & *format*) const

Print job description to a std::ostream object.

The job description will be written to the passed std::ostream object out in the format indicated by the format parameter. The format parameter should specify the format of one of the job description languages supported by the library. Or by specifying the special "user" or "userlong" format the job description will be written as a attribute/value pair list with respectively less or more attributes.

The mote

Returns

true if writing the job description to the out object succeeds, otherwise false.

Parameters

out	a std::ostream reference specifying the ostream to write the job description to.
format	specifies the format the job description should written in.

5.156.2.5 JobDescriptionResult Arc::JobDescription::UnParse (std::string & *product*, std::string *language*, const std::string & *dialect* = "") const

Output contents in the specified language.

Parameters

product	
language	
dialect	

Returns

5.156.3 Field Documentation

5.156.3.1 std::map<std::string, std::string> Arc::JobDescription::OtherAttributes

Holds attributes not fitting into this class.

This member is used by JobDescriptionParser classes to store attribute/value pairs not fitting into attributes stored in this class. The form of the attribute (the key in the map) should be as follows: <language>;<attribute-name> E.g.: "nordugrid:xrsl;hostname".

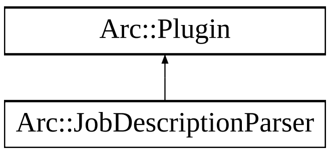
The documentation for this class was generated from the following file:

- JobDescription.h

5.157 Arc::JobDescriptionParser Class Reference

```
#include <JobDescriptionParser.h>
```

Inheritance diagram for Arc::JobDescriptionParser:



5.157.1 Detailed Description

Abstract class for the different parsers.

The JobDescriptionParser class is abstract which provide a interface for job description parsers. A job description parser should inherit this class and overwrite the JobDescriptionParser::Parse and JobDescriptionParser::UnParse methods.

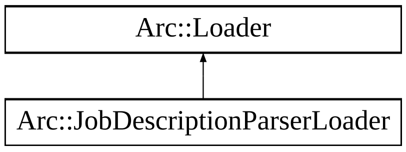
The documentation for this class was generated from the following file:

- JobDescriptionParser.h

5.158 Arc::JobDescriptionParserLoader Class Reference

```
#include <JobDescriptionParser.h>
```

Inheritance diagram for Arc::JobDescriptionParserLoader:



Data Structures

- class iterator

Public Member Functions

- JobDescriptionParserLoader ()
- ∼JobDescriptionParserLoader ()
- JobDescriptionParser ∗ load (const std::string &name)
- const std::list < JobDescriptionParser ∗ > & GetJobDescriptionParsers () const

5.158.1 Detailed Description

Class responsible for loading JobDescriptionParser plugins The JobDescriptionParser objects returned by a JobDescriptionParserLoader must not be used after the JobDescriptionParserLoader goes out of scope.

5.158.2 Constructor & Destructor Documentation

5.158.2.1 Arc::JobDescriptionParserLoader::JobDescriptionParserLoader ( )

Constructor Creates a new JobDescriptionParserLoader.

5.158.2.2 Arc::JobDescriptionParserLoader::∼JobDescriptionParserLoader ( )

Destructor Calling the destructor destroys all JobDescriptionParser object loaded by the JobDescriptionParserLoader instance.

5.158.3 Member Function Documentation

5.158.3.1 const std::list<JobDescriptionParser∗>& Arc::JobDescriptionParserLoader::GetJobDescriptionParsers ( ) const [inline]

Retrieve the list of loaded JobDescriptionParser objects.

Returns

A reference to the list of JobDescriptionParser objects.

5.158.3.2 JobDescriptionParser∗ Arc::JobDescriptionParserLoader::load (const std::string & *name*)

Load a new JobDescriptionParser

Parameters

name	The name of the JobDescriptionParser to load.

Returns

A pointer to the new JobDescriptionParser (NULL on error).

The documentation for this class was generated from the following file:

- JobDescriptionParser.h

5.159 Arc::JobDescriptionParserResult Class Reference

The documentation for this class was generated from the following file:

- JobDescriptionParser.h

5.160 Arc::JobDescriptionParserTestACCControl Class Reference

The documentation for this class was generated from the following file:

- TestACCControl.h

5.161 Arc::JobDescriptionResult Class Reference

The documentation for this class was generated from the following file:

- JobDescription.h

5.162 Arc::JobIdentificationType Class Reference

```
#include <JobDescription.h>
```

Data Fields

- std::string JobName
- std::string Description
- std::string Type
- std::list< std::string > Annotation
- std::list< std::string > ActivityOldID

5.162.1 Detailed Description

Job identification.

This class serves to provide human readable information about a job description. - Some of this information might also be passed to the execution service for providing information about the job created from this job description. An object of this class is part of the JobDescription class as the Identification public member.

5.162.2 Field Documentation

5.162.2.1 std::list<std::string> Arc::JobIdentificationType::ActivityOldID

ID of old activity.

The ActivityOldID object is used to store a list of IDs corresponding to activities which were performed from this job description. This information is not intended to used by the execution service, but rather used for keeping track of activities, e.g. when doing a job resubmission the old activity ID is appended to this list.

5.162.2.2 std::list<std::string> Arc::JobIdentificationType::Annotation

Annotation.

The Annotation list is used for human readable comments, tags for free grouping or identifying different activities.

5.162.2.3 std::string Arc::JobIdentificationType::Description

Human readable description.

The Description string can be used to provide a human readable description of e.g. the task which should be performed when processing the job description.

5.162.2.4 std::string Arc::JobIdentificationType::JobName

Name of job.

The JobName string is used to specify a name of the job description, and it will most likely also be the name given to the job when created at the execution service.

5.162.2.5 std::string Arc::JobIdentificationType::Type

Job type.

The Type string specifies a classification of the activity in compliance with GLUE2. The possible values should follow those defined in the ComputingActivityType_t enumeration of GLUE2.

The documentation for this class was generated from the following file:

- JobDescription.h

5.163 Arc::JobListRetrieverPluginTESTControl Class Reference

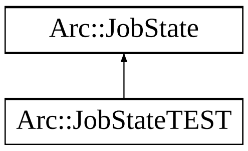
The documentation for this class was generated from the following file:

- TestACCControl.h

5.164 Arc::JobState Class Reference

```
#include <JobState.h>
```

Inheritance diagram for Arc::JobState:



Public Member Functions

- bool IsFinished () const

5.164.1 Detailed Description

ARC general state model. The class comprise the general state model of the ARC-lib, and are herein used to compare job states from the different middlewares supported by the plugin structure of the ARC-lib. Which is why every ACC plugin should contain a class derived from this class. The derived class should consist of a constructor and a mapping function (a JobStateMap) which maps a std::string to a JobState:State-Type. An example of a constructor in a plugin could be: JobStatePlugin::JobState-Pluging(const std::string& state) : JobState(state, &pluginStateMap) {} where &plugin-StateMap is a reference to the JobStateMap defined by the derived class.

5.164.2 Member Function Documentation

5.164.2.1 bool Arc::JobState::IsFinished ( ) const [inline]

Check if state is finished.

Returns

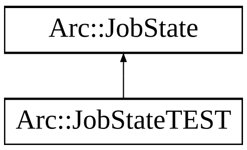
true is returned if the StateType is equal to FINISHED, KILLED, FAILED or DELETED, otherwise false is returned.

The documentation for this class was generated from the following file:

- JobState.h

5.165 Arc::JobStateTEST Class Reference

Inheritance diagram for Arc::JobStateTEST:



The documentation for this class was generated from the following file:

- TestACCControl.h

5.166 Arc::JobSupervisor Class Reference

```
#include <JobSupervisor.h>
```

Public Member Functions

- JobSupervisor (const UserConfig &usercfg, const std::list< Job > &jobs=std::list< Job >())
- bool AddJob (const Job &job)
- std::list< Job > GetJobs (bool includeJobsWithoutStatus=true) const
- void Update ()
- bool Retrieve (const std::string &downloaddirprefix, bool usejobname, bool force, std::list< std::string > &downloaddirectories)
- bool Renew ()
- bool Resume ()

- bool Resubmit (int destination, std::list< Job > &resubmittedJobs)
- bool Migrate (bool forcemigration, std::list< Job > &migratedJobs)
- bool Cancel ()
- bool Clean ()
- const std::list< JobController ∗ > & GetJobControllers () const

5.166.1 Detailed Description

% JobSupervisor class

The JobSupervisor class is tool for loading JobController plugins for managing Grid jobs.

5.166.2 Constructor & Destructor Documentation

5.166.2.1 Arc::JobSupervisor::JobSupervisor (const UserConfig & *usercfg*, const std::list< Job > & *jobs* = `std::list< Job >()`)

Create a JobSupervisor.

The list of Job objects passed to the constructor will be managed by this JobSupervisor, through the JobController class. It is important that the Flavour member of each Job object is set and correspond to the JobController plugin which are capable of managing that specific job. The JobController plugin will be loaded using the JobControllerLoader class, loading a plugin of type "HED:JobController" and name specified by the Flavour member, and the a reference to the UserConfig object usercfg will be passed to the plugin. Additionally a reference to the UserConfig object usercfg will be stored, thus usercfg must exist throughout the scope of the created object. If the Flavour member of a Job object is unset, a VERBOSE log message will be reported and that Job object will be ignored. If the JobController plugin for a given Flavour cannot be loaded, a WARNING log message will be reported and any Job object with that Flavour will be ignored. If loading of a specific plugin failed, that plugin will not be tried loaded for subsequent Job objects requiring that plugin. Job objects will be added to the corresponding JobController plugin, if loaded successfully.

Parameters

usercfg	UserConfig object to pass to JobController plugins and to use in member methods.
jobs	List of Job objects which will be managed by the created object.

5.166.3 Member Function Documentation

5.166.3.1 bool Arc::JobSupervisor::AddJob (const Job & *job*)

Add job.

Add Job object to this JobSupervisor for job management. The Job object will be passed to the corresponding specialized JobController.

Parameters

job	Job object to add for job management

Returns

true is returned if the passed Job object was added to the underlying JobController, otherwise false is returned and a log message emitted with the reason.

5.166.3.2 bool Arc::JobSupervisor::Cancel ( )

Cancel jobs.

This method cancels jobs managed by this JobSupervisor.

Before identifying jobs to cancel, the JobController::UpdateJobs method is called for each loaded JobController in order to retrieve the most up to date job information.

Since jobs in the JobState::DELETED, JobState::FINISHED, JobState::KILLED or JobState::FAILED states is already in a terminal state, a cancel request will not be send for those. Also no request will be send for jobs in the JobState::UNDEFINED state, since job information is not available. If the status-filter is non-empty, a cancel request will only be send to jobs with a general or specific state (see JobState) identical to any of the entries in the status-filter, excluding the states mentioned above.

For each job to be cancelled, the specialized JobController::CancelJob method is called and is responsible for cancelling the given job. If the method fails to cancel a job, this method will return false (otherwise true), and the job ID (IDFromEndpoint) of such jobs is appended to the notcancelled list. The job ID of successfully cancelled jobs will be appended to the passed cancelled list.

Returns

false if any call to JobController::CancelJob failed, true otherwise.

See also

JobController::CancelJob.

5.166.3.3 bool Arc::JobSupervisor::Clean ( )

Clean jobs.

This method is identical to the CleanByIDs method, except that before cleaning jobs, the JobController::GetInformation method is called in order to update job information, and that jobs are selected by job status instead of by job IDs. The status list argument should contain states for which cleaning of job in any of those states should be carried out. The states are compared using both the JobState::operator() and JobState::GetGeneralState() methods. If the status list is empty, all jobs will be selected for cleaning.

Returns

false if calls to JobController::CleanJob fails, true otherwise.

5.166.3.4 const std::list<JobController*>& Arc::JobSupervisor::GetJobControllers ( ) const [inline]

Get list of JobControllers.

Method to get the list of JobControllers loaded by constructor.

References Arc::JobControllerLoader::GetJobControllers().

5.166.3.5 std::list<Job> Arc::JobSupervisor::GetJobs (bool *includeJobsWithoutStatus* = true) const

Get list of managed jobs.

The list of jobs managed by this JobSupervisor is returned when calling this method. If the includeJobsWithoutStatus argument is set to false, only Job objects with a valid State attribute is returned.

Parameters

includeJob-Without-Status	specifies whether jobs with invalid status should be included in the returned list

Returns

list of Job objects managed by this JobSupervisor

See also

JobState::operator bool

5.166.3.6 bool Arc::JobSupervisor::Migrate (bool *forcemigration,* std::list< Job > & *migratedJobs*)

Migrate jobs.

Jobs managed by this JobSupervisor will be migrated when invoking this method, that is the job description of a job will be tried obtained, and if successful a job migration request will be sent, based on that job description.

Before identifying jobs to be migrated, the JobController::UpdateJobs method is called for each loaded JobController in order to retrieve the most up to date job information. Only jobs for which the State member of the Job object has the value JobState::QUEUEING, will be considered for migration. Furthermore the job description must be obtained (either locally or remote) and successfully parsed in order for a job to be migrated. If the job description cannot be obtained or parsed an ERROR log message is reported, and the IDFromEndpoint URL of the Job object is appended to the notmigrated list. If no jobs have been identified for migration, false will be returned in case ERRORs were reported, otherwise true is returned.

The execution services which can be targeted for migration are those specified in the UserConfig object of this class, as selected services. Before initiating any job migration request, resource discovery and broker∗ loading is carried out using the TargetGenerator and Broker classes, initialised by the UserConfig object of this class. If Broker loading fails, or no ExecutionTargets are found, an ERROR log message is reported and all IDFromEndpoint URLs for job considered for migration will be appended to the notmigrated list and then false will be returned.

When the above checks have been carried out successfully, the following is done for each job considered for migration. The ActivityOldID member of the Identification member in the job description will be set to that of the Job object, and the IDFromEndpoint URL will be appended to ActivityOldID member of the job description. After that the Broker object will be used to find a suitable ExecutionTarget object, and if found a migrate request will tried sent using the ExecutionTarget::Migrate method, passing the UserConfig object of this class. The passed forcemigration boolean indicates whether the migration request at the service side should ignore failures in cancelling the existing queuing job. If the request succeeds, the corresponding new Job object is appended to the migratedJobs list. If no suitable ExecutionTarget objects are found an ERROR log message is reported and the IDFromEndpoint URL of the Job object is appended to the notmigrated list. When all jobs have been processed, false is returned if any ERRORs were reported, otherwise true.

Parameters

forcemigration	indicates whether migration should succeed if service fails to cancel the existing queuing job.
migratedJobs	list of Job objects which migrated jobs will be appended to.

Returns

false if any error is encountered, otherwise true.

5.166.3.7 bool Arc::JobSupervisor::Renew ( )

Renew job credentials.

This method will renew credentials of jobs managed by this JobSupervisor.

Before identifying jobs for which to renew credentials, the JobController::UpdateJobs method is called for each loaded JobController in order to retrieve the most up to date job information.

Since jobs in the JobState::DELETED, JobState::FINISHED or JobState::KILLED states is in a terminal state credentials for those jobs will not be renewed. Also jobs in the JobState::UNDEFINED state will not get their credentials renewed, since job information is not available. The JobState::FAILED state is also a terminal state, but since jobs in this state can be restarted, credentials for such jobs can be renewed. If the status-filter is non-empty, a renewal of credentials will be done for jobs with a general or specific state (see JobState) identical to any of the entries in the status-filter, excluding the already filtered states as mentioned above.

For each job for which to renew credentials, the specialized JobController::RenewJob method is called and is responsible for renewing the credentials for the given job. If the method fails to renew any job credentials, this method will return false (otherwise true), and the job ID (IDFromEndpoint) of such jobs is appended to the notrenewed list. The job ID of successfully renewed jobs will be appended to the passed renewed list.

Returns

false if any call to JobController::RenewJob fails, true otherwise.

See also

JobController::RenewJob.

5.166.3.8 bool Arc::JobSupervisor::Resubmit (int *destination*, std::list< Job > & *resubmittedJobs*)

Resubmit jobs.

Jobs managed by this JobSupervisor will be resubmitted when invoking this method, that is the job description of a job will be tried obtained, and if successful a new job will be submitted.

Before identifying jobs to be resubmitted, the JobController::UpdateJobs method is called for each loaded JobController in order to retrieve the most up to date job information. If an empty status-filter is specified, all jobs managed by this JobSupervisor will be considered for resubmission, except jobs in the undefined state (see JobState). If the status-filter is not empty, then only jobs with a general or specific state (see JobState) identical to any of the entries in the status-filter will be considered, except jobs in the undefined state. Jobs for which a job description cannot be obtained and successfully parsed will not be considered and an ERROR log message is reported, and the IDFromEndpoint URL is appended to the notresubmitted list. Job descriptions will be tried obtained either from Job object itself, or fetching them remotely. Furthermore if a Job object has the LocalInputFiles object set, then the checksum of each of the local input files specified in that object (key) will be calculated and verified to match the checksum LocalInputFiles object (value). If checksums are not matching the job will be filtered, and an ERROR log message is reported and the IDFromEndpoint URL is appended to the notresubmitted list. If no job have been identified for resubmission, false will be returned if ERRORs were reported, otherwise true is returned.

The destination for jobs is partly determined by the destination parameter. If a value of 1 is specified a job will only be targeted to the execution service (ES) on which it reside. A value of 2 indicates that a job should not be targeted to the ES it currently reside. Specifying any other value will target any ES. The ESs which can be targeted are those specified in the UserConfig object of this class, as selected services. Before initiating any job submission, resource discovery and broker loading is carried out using the TargetGenerator and Broker classes, initialised by the UserConfig object of this class. If Broker loading fails, or no ExecutionTargets are found, an ERROR log message is reported and all IDFromEndpoint URLs for job considered for resubmission will be appended to the notresubmitted list and then false will be returned.

When the above checks have been carried out successfully, then the Broker::Submit method will be invoked for each considered for resubmission. If it fails the IDFrom-Endpoint URL for the job is appended to the notresubmitted list, and an ERROR is reported. If submission succeeds the new job represented by a Job object will be appended to the resubmittedJobs list - it will not be added to this JobSupervisor. The method returns false if ERRORs were reported otherwise true is returned.

Parameters

destination	specifies how target destination should be determined (1 = same target, 2 = not same, any other = any target).
resubmitted-Jobs	list of Job objects which resubmitted jobs will be appended to.

Returns

false if any error is encountered, otherwise true.

5.166.3.9 bool Arc::JobSupervisor::Resume ( )

Resume jobs by status.

This method resumes jobs managed by this JobSupervisor.

Before identifying jobs to resume, the JobController::UpdateJobs method is called for each loaded JobController in order to retrieve the most up to date job information.

Since jobs in the JobState::DELETED, JobState::FINISHED or JobState::KILLED states is in a terminal state credentials for those jobs will not be renewed. Also jobs in the -JobState::UNDEFINED state will not be resumed, since job information is not available. The JobState::FAILED state is also a terminal state, but jobs in this state are allowed to be restarted. If the status-filter is non-empty, only jobs with a general or specific state (see JobState) identical to any of the entries in the status-filter will be resumed, excluding the already filtered states as mentioned above.

For each job to resume, the specialized JobController::ResumeJob method is called and is responsible for resuming the particular job. If the method fails to resume a job, this method will return false, otherwise true is returned. The job ID of successfully resumed jobs will be appended to the passed resumedJobs list.

Returns

false if any call to JobController::ResumeJob fails, true otherwise.

See also

JobController::ResumeJob.

5.166.3.10 bool Arc::JobSupervisor::Retrieve (const std::string & *downloaddirprefix,* bool *usejobname,* bool *force,* std::list< std::string > & *downloaddirectories*)

Retrieve job output files.

This method retrieves output files of jobs managed by this JobSupervisor.

Before identifying jobs for which to retrieve output files, the JobController::UpdateJobs method is called for each loaded JobController in order to retrieve the most up to date job information. If an empty status-filter is specified, all jobs managed by this JobSupervisor will be considered for retrieval, except jobs in the undefined state (see JobState). If the status-filter is not empty, then only jobs with a general or specific state (see JobState) identical to any of the entries in the status-filter will be considered, except jobs in the undefined state. Jobs in the state JobState::DELETED and unfinished jobs (see JobState::IsFinished) will also not be considered.

For each of the jobs considered for retrieval, the files will be downloaded to a directory named either as the last part of the job ID or the job name, which is determined by the 'usejobname' argument. The download directories will be located in the directory specified by the 'downloaddir' argument, as either a relative or absolute path. If the 'force' argument is set to 'true', and a download directory for a given job already exist it will be overwritten, otherwise files for that job will not be downloaded. This method calls the JobController::GetJob method in order to download jobs, and if a job is successfully retrieved the job ID will be appended to the 'retrievedJobs' list. If all jobs are successfully retrieved this method returns true, otherwise false.

Parameters

downloaddir	specifies the path to in which job download directories will be located.
usejobname	specifies whether to use the job name or job ID as directory name to store job output files in.
force	indicates whether existing job directories should be overwritten or not.

See also

JobController::RetrieveJob.

Returns

true if all jobs are successfully retrieved, otherwise false.

5.166.3.11 void Arc::JobSupervisor::Update ( )

Update job information.

When invoking this method the job information for the jobs managed by this JobSupervisor will be updated. Internally, for each loaded JobController the JobController::UpdateJobs method will be called, which will be responsible for updating job information.

The documentation for this class was generated from the following file:

- JobSupervisor.h

5.167 Arc::LoadableModuleDesciption Class Reference

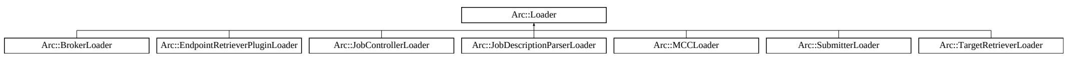
The documentation for this class was generated from the following file:

- ModuleManager.h

5.168 Arc::Loader Class Reference

```
#include <Loader.h>
```

Inheritance diagram for Arc::Loader:


Arc::Loader
Arc::BrokerLoader
Arc::EndpointRetrieverPluginLoader
Arc::JobControllerLoader
Arc::JobDescriptionParserLoader
Arc::MCCLoader
Arc::SubmitterLoader
Arc::TargetRetrieverLoader

Public Member Functions

- Loader (XMLNode cfg)
- ∼Loader ()

Protected Attributes

- PluginsFactory ∗ factory_

5.168.1 Detailed Description

Plugins loader.

This class processes XML configration and loads specified plugins. Accepted configuration is defined by XML schema mcc.xsd. "Plugins" elements are parsed by this class and corresponding libraries are loaded.

5.168.2 Constructor & Destructor Documentation

5.168.2.1 Arc::Loader::Loader (**XMLNode** *cfg*)

Constructor that takes whole XML configuration and performs common configuration part

5.168.2.2 Arc::Loader::~Loader ( )

Destructor destroys all components created by constructor

5.168.3 Field Documentation

5.168.3.1 PluginsFactory∗ Arc::Loader::factory_ [protected]

Link to Factory responsible for loading and creation of Plugin and derived objects

Referenced by Arc::ChainContext::operator PluginsFactory ∗().

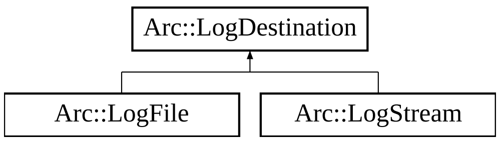
The documentation for this class was generated from the following file:

- Loader.h

5.169 Arc::LogDestination Class Reference

`#include <Logger.h>`

Inheritance diagram for Arc::LogDestination:



Public Member Functions

- virtual void log (const LogMessage &message)=0

Protected Member Functions

- LogDestination ()
- LogDestination (const std::string &locale)

5.169.1 Detailed Description

A base class for log destinations.

This class defines an interface for LogDestinations. LogDestination objects will typically contain synchronization mechanisms and should therefore never be copied.

5.169.2 Constructor & Destructor Documentation

5.169.2.1 Arc::LogDestination::LogDestination ( ) `[protected]`

Default constructor.

This destination will use the default locale.

5.169.2.2 Arc::LogDestination::LogDestination (const std::string & *locale*) `[protected]`

Constructor with specific locale.

This destination will use the specified locale.

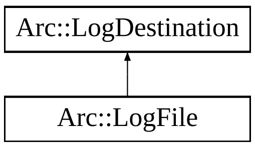
The documentation for this class was generated from the following file:

- Logger.h

5.170 Arc::LogFile Class Reference

`#include <Logger.h>`

Inheritance diagram for Arc::LogFile:



Public Member Functions

- LogFile (const std::string &path)
- LogFile (const std::string &path, const std::string &locale)
- void setMaxSize (int newsize)
- void setBackups (int newbackup)
- void setReopen (bool newreopen)
- operator bool (void)
- bool operator! (void)

- virtual void log (const LogMessage &message)

5.170.1 Detailed Description

A class for logging to files.

This class is used for logging to files. It provides synchronization in order to prevent different LogMessages to appear mixed with each other in the stream. It is possible to limit size of created file. Whenever specified size is exceeded fiel is deleted and new one is created. Old files may be moved into backup files instead of being deleted. Those files have names same as initial file with additional number suffix - similar to those found in /var/log of many Unix-like systems.

5.170.2 Constructor & Destructor Documentation

5.170.2.1 Arc::LogFile::LogFile (const std::string & *path*)

Creates a LogFile connected to a file.

Creates a LogFile connected to the file located at specified path. In order not to break synchronization, it is important not to connect more than one LogFile object to a certain file. If file does not exist it will be created.

Parameters

path	The path to file to which to write LogMessages.

5.170.2.2 Arc::LogFile::LogFile (const std::string & *path,* const std::string & *locale*)

Creates a LogFile connected to a file.

Creates a LogFile connected to the file located at specified path. The output will be localised to the specified locale.

5.170.3 Member Function Documentation

5.170.3.1 virtual void Arc::LogFile::log (const LogMessage & *message*) `[virtual]`

Writes a LogMessage to the file.

This method writes a LogMessage to the file that is connected to this LogFile object. If after crititng size of file exceeds one set by setMaxSize() file is moved to backup and new one is created.

Parameters

message	The LogMessage to write.

Implements Arc::LogDestination.

5.170.3.2 void Arc::LogFile::setBackups (int *newbackup*)

Set number of backups to store.

Set number of backups to store. When file size exceeds one specified with setMaxSize() file is closed and moved to one named path.1. If path.1 exists it is moved to path.2 and so on. Number of path.# files is one set in newbackup.

Parameters

newbackup	Number of backup files.

5.170.3.3 void Arc::LogFile::setMaxSize (int *newsize*)

Set maximal allowed size of file.

Set maximal allowed size of file. This value is not obeyed exactly. Spesified size may be exceeded by amount of one LogMessage. To disable limit specify -1.

Parameters

newsize	Max size of log file.

5.170.3.4 void Arc::LogFile::setReopen (bool *newreopen*)

Set file reopen on every write.

Set file reopen on every write. If set to true file is opened before writing every log record and closed afterward.

Parameters

newreopen	If file to be reopened for every log record.

The documentation for this class was generated from the following file:

- Logger.h

5.171 Arc::Logger Class Reference

```
#include <Logger.h>
```

Public Member Functions

- Logger (Logger &parent, const std::string &subdomain)
- Logger (Logger &parent, const std::string &subdomain, LogLevel threshold)
- ∼Logger ()
- void addDestination (LogDestination &destination)
- void addDestinations (const std::list< LogDestination ∗ > &destinations)
- const std::list < LogDestination ∗ > & getDestinations (void) const
- void removeDestinations (void)
- void deleteDestinations (void)
- void setThreshold (LogLevel threshold)
- LogLevel getThreshold () const
- void setThreadContext (void)
- void msg (LogMessage message)
- void msg (LogLevel level, const std::string &str)

Static Public Member Functions

- static Logger & getRootLogger ()
- static void setThresholdForDomain (LogLevel threshold, const std::list< std::string > &subdomains)
- static void setThresholdForDomain (LogLevel threshold, const std::string &domain)

5.171.1 Detailed Description

A logger class.

This class defines a Logger to which LogMessages can be sent.

Every Logger (except for the rootLogger) has a parent Logger. The domain of a Logger (a string that indicates the origin of LogMessages) is composed by adding a subdomain to the domain of its parent Logger.

A Logger also has a threshold. Every LogMessage that have a level that is greater than or equal to the threshold is forwarded to any LogDestination connected to this Logger as well as to the parent Logger.

Typical usage of the Logger class is to declare a global Logger object for each library/-module/component to be used by all classes and methods there.

5.171.2 Constructor & Destructor Documentation

5.171.2.1 Arc::Logger::Logger (**Logger** & *parent,* const std::string & *subdomain*)

Creates a logger.

Creates a logger. The threshold is inherited from its parent Logger.

Parameters

parent	The parent Logger of the new Logger.
subdomain	The subdomain of the new logger.

5.171.2.2 Arc::Logger::Logger (Logger & *parent*, const std::string & *subdomain*, LogLevel *threshold*)

Creates a logger.

Creates a logger.

Parameters

parent	The parent Logger of the new Logger.
subdomain	The subdomain of the new logger.
threshold	The threshold of the new logger.

5.171.2.3 Arc::Logger::∼Logger ( )

Destroys a logger.

Destructor

5.171.3 Member Function Documentation

5.171.3.1 void Arc::Logger::addDestination (LogDestination & *destination*)

Adds a LogDestination.

Adds a LogDestination to which to forward LogMessages sent to this logger (if they pass the threshold). Since LogDestinatoins should not be copied, the new LogDestination is passed by reference and a pointer to it is kept for later use. It is therefore important that the LogDestination passed to this Logger exists at least as long as the Logger iteslf.

5.171.3.2 void Arc::Logger::addDestinations (const std::list< LogDestination ∗ > & *destinations*)

Adds LogDestinations.

See addDestination(LogDestination& destination).

5.171.3.3 const std::list<LogDestination∗>& Arc::Logger::getDestinations (void) const

Obtains current LogDestinations.

Returns list of pointers to LogDestination objects. Returned result refers directly to internal member of Logger intance. Hence it should not be used after this Logger is destroyed.

5.171.3.4 static Logger& Arc::Logger::getRootLogger ( ) [static]

The root Logger.

This is the root Logger. It is an ancestor of any other Logger and allways exists.

5.171.3.5 LogLevel Arc::Logger::getThreshold ( ) const

Returns the threshold.

Returns the threshold.

Returns

The threshold of this Logger.

5.171.3.6 void Arc::Logger::msg (LogMessage *message*)

Sends a LogMessage.

Sends a LogMessage.

Parameters

The	LogMessage to send.

Referenced by msg(), and Arc::stringto().

5.171.3.7 void Arc::Logger::msg (LogLevel *level,* const std::string & *str*) [inline]

Logs a message text.

Logs a message text string at the specified LogLevel. This is a convenience method to save some typing. It simply creates a LogMessage and sends it to the other msg() method.

Parameters

level	The level of the message.
str	The message text.

References msg().

5.171.3.8 void Arc::Logger::setThreadContext (void)

Creates per-thread context.

Creates new context for this logger which becomes effective for operations initiated by this thread. All new threads started by this one will inherit new context. Context stores current threshold and pointers to destinations. Hence new context is identical to current one. One can modify new context using setThreshold(), removeDestinations() and addDestination(). All such operations will not affect old context.

5.171.3.9 void Arc::Logger::setThreshold (LogLevel *threshold*)

Sets the threshold.

This method sets the threshold of the Logger. Any message sent to this Logger that has a level below this threshold will be discarded.

Parameters

The	threshold

5.171.3.10 static void Arc::Logger::setThresholdForDomain (LogLevel *threshold*, const std::list< std::string > & *subdomains*) [static]

Sets the threshold for domain.

This method sets the default threshold of the domain. All new loggers created with specified domain will have specified threshold set by default. The subdomains of all loggers in chain are matched against list of provided subdomains.

Parameters

threshold	The threshold
subdomains	The subdomains of all loggers in chain

5.171.3.11 static void Arc::Logger::setThresholdForDomain (LogLevel *threshold*, const std::string & *domain*) [static]

Sets the threshold for domain.

This method sets the default threshold of the domain. All new loggers created with specified domain will have specified threshold set by default. The domain is composed of all subdomains of all loggers in chain by merging them with '.' as separator.

Parameters

threshold	The threshold
domain	The domain of logger

The documentation for this class was generated from the following file:

- Logger.h

5.172 Arc::LoggerContext Class Reference

```
#include <Logger.h>
```

5.172.1 Detailed Description

Container for logger configuration.

The documentation for this class was generated from the following file:

- Logger.h

5.173 Arc::LoggerFormat Struct Reference

The documentation for this struct was generated from the following file:

- Logger.h

5.174 Arc::LogMessage Class Reference

```
#include <Logger.h>
```

Public Member Functions

- LogMessage (LogLevel level, const IString &message)
- LogMessage (LogLevel level, const IString &message, const std::string &identifier)
- LogLevel getLevel () const

Protected Member Functions

- void setIdentifier (std::string identifier)

Friends

- class Logger
- std::ostream & operator<< (std::ostream &os, const LogMessage &message)

5.174.1 Detailed Description

A class for log messages.

This class is used to represent log messages internally. It contains the time the message was created, its level, from which domain it was sent, an identifier and the message text itself.

5.174.2 Constructor & Destructor Documentation

5.174.2.1 Arc::LogMessage::LogMessage (**LogLevel** *level*, const **IString** & *message*)

Creates a LogMessage with the specified level and message text.

This constructor creates a LogMessage with the specified level and message text. The time is set automatically, the domain is set by the Logger to which the LogMessage is sent and the identifier is composed from the process ID and the address of the Thread object corresponding to the calling thread.

Parameters

level	The level of the LogMessage.
message	The message text.

5.174.2.2 Arc::LogMessage::LogMessage (**LogLevel** *level*, const **IString** & *message*, const std::string & *identifier*)

Creates a LogMessage with the specified attributes.

This constructor creates a LogMessage with the specified level, message text and identifier. The time is set automatically and the domain is set by the Logger to which the LogMessage is sent.

Parameters

level	The level of the LogMessage.
message	The message text.
ident	The identifier of the LogMessage.

5.174.3 Member Function Documentation

5.174.3.1 **LogLevel** Arc::LogMessage::getLevel ( ) const

Returns the level of the LogMessage.

Returns the level of the LogMessage.

Returns

The level of the LogMessage.

5.174.3.2 void Arc::LogMessage::setIdentifier (std::string *identifier*) [protected]

Sets the identifier of the LogMessage.

The purpose of this method is to allow subclasses (in case there are any) to set the identifier of a LogMessage.

Parameters

The	identifier.

5.174.4 Friends And Related Function Documentation

5.174.4.1 friend class Logger [friend]

The Logger class is a friend.

The Logger class must have some privileges (e.g. ability to call the setDomain() method), therefore it is a friend.

5.174.4.2 std::ostream& operator<< (std::ostream & *os*, const LogMessage & *message*) [friend]

Printing of LogMessages to ostreams.

Output operator so that LogMessages can be printed conveniently by LogDestinations.

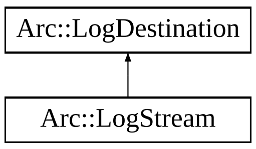
The documentation for this class was generated from the following file:

- Logger.h

5.175 Arc::LogStream Class Reference

```
#include <Logger.h>
```

Inheritance diagram for Arc::LogStream:



Public Member Functions

- LogStream (std::ostream &destination)
- LogStream (std::ostream &destination, const std::string &locale)
- virtual void log (const LogMessage &message)

5.175.1 Detailed Description

A class for logging to ostreams.

This class is used for logging to ostreams (cout, cerr, files). It provides synchronization in order to prevent different LogMessages to appear mixed with each other in the stream. In order not to break the synchronization, LogStreams should never be copied. Therefore the copy constructor and assignment operator are private. Furthermore, it is important to keep a LogStream object as long as the Logger to which it has been registered.

5.175.2 Constructor & Destructor Documentation

5.175.2.1 Arc::LogStream::LogStream (std::ostream & *destination*)

Creates a LogStream connected to an ostream.

Creates a LogStream connected to the specified ostream. In order not to break synchronization, it is important not to connect more than one LogStream object to a certain stream.

Parameters

destination	The ostream to which to erite LogMessages.

5.175.2.2 Arc::LogStream::LogStream (std::ostream & *destination,* const std::string & *locale*)

Creates a LogStream connected to an ostream.

Creates a LogStream connected to the specified ostream. The output will be localised to the specified locale.

5.175.3 Member Function Documentation

5.175.3.1 virtual void Arc::LogStream::log (const LogMessage & *message*) `[virtual]`

Writes a LogMessage to the stream.

This method writes a LogMessage to the ostream that is connected to this LogStream object. It is synchronized so that not more than one LogMessage can be written at a time.

Parameters

message	The LogMessage to write.

Implements Arc::LogDestination.

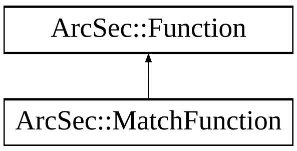
The documentation for this class was generated from the following file:

- Logger.h

5.176 ArcSec::MatchFunction Class Reference

`#include <MatchFunction.h>`

Inheritance diagram for ArcSec::MatchFunction:



Public Member Functions

- virtual AttributeValue ∗ evaluate (AttributeValue ∗arg0, AttributeValue ∗arg1, bool check_id=true)
- virtual std::list < AttributeValue ∗ > evaluate (std::list< AttributeValue ∗ > args, bool check_id=true)

Static Public Member Functions

- static std::string getFunctionName (std::string datatype)

5.176.1 Detailed Description

Evaluate whether arg1 (value in regular expression) matched arg0 (lable in regular expression)

5.176.2 Member Function Documentation

5.176.2.1 virtual **AttributeValue**∗ ArcSec::MatchFunction::evaluate (**AttributeValue** ∗ *arg0*, **AttributeValue** ∗ *arg1*, bool *check_id* = `true`) `[virtual]`

Evaluate two AttributeValue objects, and return one AttributeValue object

Implements ArcSec::Function.

5.176.2.2 virtual std::list<AttributeValue*> ArcSec::MatchFunction::evaluate (std::list< AttributeValue * > *args*, bool *check_id* = true) [virtual]

Evaluate a list of AttributeValue objects, and return a list of Attribute objects

Implements ArcSec::Function.

5.176.2.3 static std::string ArcSec::MatchFunction::getFunctionName (std::string *datatype*) [static]

help function to get the FunctionName

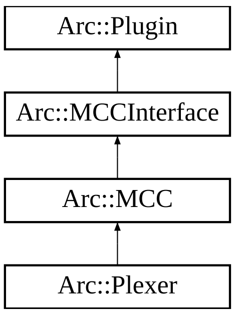
The documentation for this class was generated from the following file:

- MatchFunction.h

5.177 Arc::MCC Class Reference

`#include <MCC.h>`

Inheritance diagram for Arc::MCC:



Public Member Functions

- MCC (Config *)
- virtual void Next (MCCInterface *next, const std::string &label="")
- virtual void AddSecHandler (Config *cfg, ArcSec::SecHandler *sechandler, const std::string &label="")
- virtual void Unlink ()
- virtual MCC_Status process (Message &, Message &)

Protected Member Functions

- bool ProcessSecHandlers (Message &message, const std::string &label="") const

Protected Attributes

- std::map< std::string, MCCInterface * > next_
- std::map< std::string, std::list< ArcSec::SecHandler * > > sechandlers_

Static Protected Attributes

- static Logger logger

5.177.1 Detailed Description

Message Chain Component - base class for every MCC plugin.

This is partialy virtual class which defines interface and common functionality for every MCC plugin needed for managing of component in a chain.

5.177.2 Constructor & Destructor Documentation

5.177.2.1 Arc::MCC::MCC (**Config** *) `[inline]`

Example contructor - MCC takes at least it's configuration subtree

5.177.3 Member Function Documentation

5.177.3.1 virtual void Arc::MCC::AddSecHandler (**Config** * *cfg*, **ArcSec::SecHandler** * *sechandler*, const std::string & *label* = "") `[virtual]`

Add security components/handlers to this MCC. Security handlers are stacked into a few queues with each queue identified by its label. The queue labelled 'incoming' is executed for every 'request' message after the message is processed by the MCC on the service side and before processing on the client side. The queue labelled 'outgoing' is run for response message before it is processed by MCC algorithms on the service side and after processing on the client side. Those labels are just a matter of agreement and some MCCs may implement different queues executed at various message processing steps.

5.177.3.2 virtual void Arc::MCC::Next (**MCCInterface** * *next*, const std::string & *label* = "") `[virtual]`

Add reference to next MCC in chain. This method is called by Loader for every potentially labeled link to next component which implements MCCInterface. If next is NULL corresponding link is removed.

Reimplemented in Arc::Plexer.

5.177.3.3 virtual MCC_Status Arc::MCC::process (Message & , Message &) [inline, virtual]

Dummy Message processing method. Just a placeholder.

Implements Arc::MCCInterface.

Reimplemented in Arc::Plexer.

5.177.3.4 bool Arc::MCC::ProcessSecHandlers (Message & *message*, const std::string & *label* = "") const [protected]

Executes security handlers of specified queue. Returns true if the message is authorized for further processing or if there are no security handlers which implement authorization functionality. This is a convenience method and has to be called by the implemention of the MCC.

5.177.3.5 virtual void Arc::MCC::Unlink ( ) [virtual]

Removing all links. Useful for destroying chains.

5.177.4 Field Documentation

5.177.4.1 Logger Arc::MCC::logger [static, protected]

A logger for MCCs.

A logger intended to be the parent of loggers in the different MCCs.

Reimplemented in Arc::Plexer.

5.177.4.2 std::map<std::string, MCCInterface *> Arc::MCC::next_ [protected]

Set of labeled "next" components. Each implemented MCC must call process() method of corresponding MCCInterface from this set in own process() method.

5.177.4.3 std::map<std::string, std::list<ArcSec::SecHandler *> > Arc::MCC::sechandlers_ [protected]

Set of labeled authentication and authorization handlers. MCC calls sequence of handlers at specific point depending on associated identifier. In most aces those are "in" and "out" for incoming and outgoing messages correspondingly.

The documentation for this class was generated from the following file:

- MCC.h

5.178 Arc::MCC_Status Class Reference

`#include <MCC_Status.h>`

Public Member Functions

- MCC_Status (StatusKind kind=STATUS_UNDEFINED, const std::string &origin="???", const std::string &explanation="No explanation.")
- bool isOk () const
- StatusKind getKind () const
- const std::string & getOrigin () const
- const std::string & getExplanation () const
- operator std::string () const
- operator bool (void) const
- bool operator! (void) const

5.178.1 Detailed Description

A class for communication of MCC processing results.

This class is used to communicate result status between MCCs. It contains a status kind, a string specifying the origin (MCC) of the status object and an explanation.

5.178.2 Constructor & Destructor Documentation

5.178.2.1 Arc::MCC_Status::MCC_Status (StatusKind *kind* = `STATUS_UNDEFINED`, const std::string & *origin* = `"???"`, const std::string & *explanation* = `"No explanation."`)

The constructor.

Creates a MCC_Status object.

Parameters

kind	The StatusKind (default: STATUS_UNDEFINED)
origin	The origin MCC (default: "???")
explanation	An explanation (default: "No explanation.")

5.178.3 Member Function Documentation

5.178.3.1 const std::string& Arc::MCC_Status::getExplanation ( ) const

Returns an explanation.

This method returns an explanation of this object.

Returns

An explanation of this object.

5.178.3.2 StatusKind Arc::MCC_Status::getKind ( ) const

Returns the status kind.

Returns the status kind of this object.

Returns

The status kind of this object.

5.178.3.3 const std::string& Arc::MCC_Status::getOrigin ( ) const

Returns the origin.

This method returns a string specifying the origin MCC of this object.

Returns

A string specifying the origin MCC of this object.

5.178.3.4 bool Arc::MCC_Status::isOk ( ) const

Is the status kind ok?

This method returns true if the status kind of this object is STATUS_OK

Returns

true if kind==STATUS_OK

Referenced by operator bool(), and operator!().

5.178.3.5 Arc::MCC_Status::operator bool (void) const [inline]

Is the status kind ok?

This method returns true if the status kind of this object is STATUS_OK

Returns

true if kind==STATUS_OK

References isOk().

5.178.3.6 Arc::MCC_Status::operator std::string ( ) const

Conversion to string.

This operator converts a MCC_Status object to a string.

5.178.3.7 bool Arc::MCC_Status::operator! (void) const [inline]

not operator

Returns true if the status kind is not OK

Returns

true if kind!=STATUS_OK

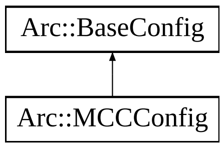
References isOk().

The documentation for this class was generated from the following file:

- MCC_Status.h

5.179 Arc::MCCConfig Class Reference

Inheritance diagram for Arc::MCCConfig:



Public Member Functions

- virtual XMLNode MakeConfig (XMLNode cfg) const

5.179.1 Member Function Documentation

5.179.1.1 virtual XMLNode Arc::MCCConfig::MakeConfig (XMLNode *cfg*) const [virtual]

Adds configuration part corresponding to stored information into common configuration tree supplied in 'cfg' argument. Returns reference to XML node representing configuration of ModuleManager

Reimplemented from Arc::BaseConfig.

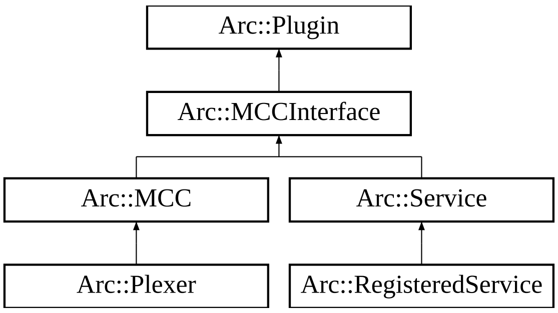
The documentation for this class was generated from the following file:

- MCC.h

5.180 Arc::MCCInterface Class Reference

`#include <MCC.h>`

Inheritance diagram for Arc::MCCInterface:



Public Member Functions

- virtual MCC_Status process (Message &request, Message &response)=0

5.180.1 Detailed Description

Interface for communication between MCC, Service and Plexer objects.

The Interface consists of the method process() which is called by the previous MC-C in the chain. For memory management policies please read the description of the Message class.

5.180.2 Member Function Documentation

5.180.2.1 virtual MCC_Status Arc::MCCInterface::process (Message & *request*, Message & *response*) `[pure virtual]`

Method for processing of requests and responses. This method is called by preceeding MCC in chain when a request needs to be processed. This method must call similar method of next MCC in chain unless any failure happens. Result returned by call to next MCC should be processed and passed back to previous MCC. In case of failure this method is expected to generate valid error response and return it back to previous MCC without calling the next one.

Parameters

request	The request that needs to be processed.
response	A Message object that will contain the response of the request when the method returns.

Returns

An object representing the status of the call.

Implemented in Arc::MCC, and Arc::Plexer.

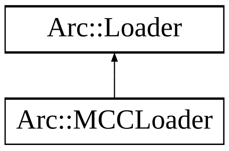
The documentation for this class was generated from the following file:

- MCC.h

5.181 Arc::MCCLoader Class Reference

`#include <MCCLoader.h>`

Inheritance diagram for Arc::MCCLoader:



Public Member Functions

- MCCLoader (Config &cfg)
- ∼MCCLoader ()
- MCC ∗ operator[] (const std::string &id)

5.181.1 Detailed Description

Creator of Message Component Chains (MCC).

This class processes XML configration and creates message chains. Accepted configuration is defined by XML schema mcc.xsd. Supported components are of types MCC, Service and Plexer. MCC and Service are loaded from dynamic libraries. For Plexer only internal implementation is supported. This object is also a container for loaded componets. All components and chains are destroyed if this object is destroyed. Chains are created in 2 steps. First all components are loaded and corresponding objects are created. Constructors are supplied with corresponding configuration subtrees. During next step components are linked together by calling their Next() methods. Each call creates labeled link to next component in a chain. 2 step method has an advantage over single step because it allows loops in chains and makes loading procedure more simple. But that also means during short period of time components are only partly configured. Components in such state must produce proper error response if Message arrives. Note: Current implementation requires all components and links to be labeled. All labels must be unique. Future implementation will be able to assign labels automatically.

5.181.2 Constructor & Destructor Documentation

5.181.2.1 Arc::MCCLoader::MCCLoader (**Config** & *cfg*)

Constructor that takes whole XML configuration and creates component chains

5.181.2.2 Arc::MCCLoader::∼MCCLoader ( )

Destructor destroys all components created by constructor

5.181.3 Member Function Documentation

5.181.3.1 MCC∗ Arc::MCCLoader::operator[] (const std::string & *id*)

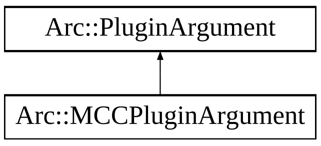
Access entry MCCs in chains. Those are components exposed for external access using 'entry' attribute

The documentation for this class was generated from the following file:

- MCCLoader.h

5.182 Arc::MCCPluginArgument Class Reference

Inheritance diagram for Arc::MCCPluginArgument:



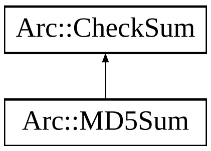
The documentation for this class was generated from the following file:

- MCC.h

5.183 Arc::MD5Sum Class Reference

```
#include <CheckSum.h>
```

Inheritance diagram for Arc::MD5Sum:



Public Member Functions

- virtual void start (void)
- virtual void add (void ∗buf, unsigned long long int len)
- virtual void end (void)
- virtual void result (unsigned char ∗&res, unsigned int &len) const
- virtual int print (char ∗buf, int len) const
- virtual void scan (const char ∗buf)
- virtual operator bool (void) const
- virtual bool operator! (void) const

5.183.1 Detailed Description

Implementation of MD5 checksum.

This class is a specialized class of the CheckSum class. It provides an implementation of the MD5 message-digest algorithm specified in RFC 1321.

5.183.2 Member Function Documentation

5.183.2.1 virtual void Arc::MD5Sum::add (void ∗ *buf,* unsigned long long int *len*) `[virtual]`

Add data to be checksummed.

This method calculates the checksum of the passed data chuck, taking into account the previous state of this object.

Parameters

buf	pointer to data chuck to be checksummed.
len	size of the data chuck.

Implements Arc::CheckSum.

5.183.2.2 virtual void Arc::MD5Sum::end (void) `[virtual]`

Finalize the checksumming.

This method finalizes the checksum algorithm, that is calculating the final checksum result.

Implements Arc::CheckSum.

5.183.2.3 virtual int Arc::MD5Sum::print (char ∗ *buf*, int *len*) const `[virtual]`

Retrieve result of checksum into a string.

The passed string buf is filled with result of checksum algorithm in base 16. At most len chacters is filled into buffer buf. The hexadecimal value is prepended with "<algorithm>:", where <algorithm> is one of "cksum", "md5" or "adler32" respectively corresponding to the result from the CRC32Sum, MD5Sum and Adler32 classes.

Parameters

buf	pointer to buffer which should be filled with checksum result.
len	max number of character filled into buffer.

Reimplemented from Arc::CheckSum.

5.183.2.4 virtual void Arc::MD5Sum::scan (const char ∗ *buf*) `[virtual]`

Set internal checksum state.

This method sets the internal state to that of the passed textural representation. The format passed to this method must be the same as retrieved from the CheckSum::print method.

Parameters

buf	string containing textural representation of checksum

See also

CheckSum::print

Implements Arc::CheckSum.

5.183.2.5 virtual void Arc::MD5Sum::start (void) `[virtual]`

Initiate the checksum algorithm.

This method must be called before starting a new checksum calculation.

Implements Arc::CheckSum.

The documentation for this class was generated from the following file:

- CheckSum.h

5.184 Arc::Message Class Reference

```
#include <Message.h>
```

Public Member Functions

- Message (void)
- Message (Message &msg)
- Message (long msg_ptr_addr)
- ∼Message (void)
- Message & operator= (Message &msg)
- MessagePayload ∗ Payload (void)
- MessagePayload ∗ Payload (MessagePayload ∗payload)
- MessageAttributes ∗ Attributes (void)
- MessageAuth ∗ Auth (void)
- MessageContext ∗ Context (void)
- MessageAuthContext ∗ AuthContext (void)
- void Context (MessageContext ∗ctx)
- void AuthContext (MessageAuthContext ∗auth_ctx)

5.184.1 Detailed Description

Object being passed through chain of MCCs.

An instance of this class refers to objects with main content (MessagePayload), authentication/authorization information (MessageAuth) and common purpose attributes (MessageAttributes). Message class does not manage pointers to objects and their content. It only serves for grouping those objects. Message objects are supposed to be processed by MCCs and Services implementing MCCInterface method process(). All objects constituting content of Message object are subject to following policies:

1. All objects created inside call to process() method using new command must be explicitely destroyed within same call using delete command with following exceptions. a) Objects which are assigned to 'response' Message. b) Objects whose management is completely acquired by objects assigned to 'response' Message.

2. All objects not created inside call to process() method are not explicitely destroyed within that call with following exception. a) Objects which are part of 'response' Method returned from call to next's process() method. Unless those objects are passed further to calling process(), of course.

3. It is not allowed to make 'response' point to same objects as 'request' does on entry to process() method. That is needed to avoid double destruction of same object. (Note: if in a future such need arises it may be solved by storing additional flags in Message object).

4. It is allowed to change content of pointers of 'request' Message. Calling process() method must not rely on that object to stay intact.

5. Called process() method should either fill 'response' Message with pointers to valid objects or to keep them intact. This makes it possible for calling process() to preload 'response' with valid error message.

5.184.2 Constructor & Destructor Documentation

5.184.2.1 Arc::Message::Message (void) [inline]

true if auth_ctx_ was created internally Dummy constructor

5.184.2.2 Arc::Message::Message (**Message** & *msg*) [inline]

Copy constructor. Ensures shallow copy.

5.184.2.3 Arc::Message::Message (long *msg_ptr_addr*)

Copy constructor. Used by language bindigs

5.184.2.4 Arc::Message::∼Message (void) [inline]

Destructor does not affect refered objects except those created internally

5.184.3 Member Function Documentation

5.184.3.1 **MessageAttributes**∗ Arc::Message::Attributes (void) [inline]

Returns a pointer to the current attributes object or creates it if no attributes object has been assigned.

Referenced by operator=().

5.184.3.2 **MessageAuth**∗ Arc::Message::Auth (void) [inline]

Returns a pointer to the current authentication/authorization object or creates it if no object has been assigned.

Referenced by operator=().

5.184.3.3 **MessageAuthContext**∗ Arc::Message::AuthContext (void) [inline]

Returns a pointer to the current auth∗ context object or creates it if no object has been assigned.

Referenced by operator=().

5.184.3.4 void Arc::Message::AuthContext (**MessageAuthContext** ∗ *auth_ctx*) `[inline]`

Assigns auth∗ context object

5.184.3.5 **MessageContext**∗ Arc::Message::Context (void) `[inline]`

Returns a pointer to the current context object or creates it if no object has been assigned. Last case should happen only if first MCC in a chain is connectionless like one implementing UDP protocol.

Referenced by operator=().

5.184.3.6 void Arc::Message::Context (**MessageContext** ∗ *ctx*) `[inline]`

Assigns message context object

5.184.3.7 **Message**& Arc::Message::operator= (**Message** & *msg*) `[inline]`

Assignment. Ensures shallow copy.

References Auth(), Attributes(), Context(), and AuthContext().

5.184.3.8 **MessagePayload**∗ Arc::Message::Payload (void) `[inline]`

Returns pointer to current payload or NULL if no payload assigned.

5.184.3.9 **MessagePayload**∗ Arc::Message::Payload (**MessagePayload** ∗ *payload*) `[inline]`

Replaces payload with new one. Returns the old one.

The documentation for this class was generated from the following file:

- Message.h

5.185 Arc::MessageAttributes Class Reference

```
#include <MessageAttributes.h>
```

Public Member Functions

- MessageAttributes ()
- void set (const std::string &key, const std::string &value)
- void add (const std::string &key, const std::string &value)
- void removeAll (const std::string &key)
- void remove (const std::string &key, const std::string &value)
- int count (const std::string &key) const
- const std::string & get (const std::string &key) const
- AttributeIterator getAll (const std::string &key) const
- AttributeIterator getAll (void) const

Protected Attributes

- AttrMap attributes_

5.185.1 Detailed Description

A class for storage of attribute values.

This class is used to store attributes of messages. All attribute keys and their corresponding values are stored as strings. Any key or value that is not a string must thus be represented as a string during storage. Furthermore, an attribute is usually a key-value pair with a unique key, but there may also be multiple such pairs with equal keys.

The key of an attribute is composed by the name of the Message Chain Component (M-CC) which produce it and the name of the attribute itself with a colon (:) in between, i.e. MCC_Name:Attribute_Name. For example, the key of the "Content-Length" attribute of the HTTP MCC is thus "HTTP:Content-Length".

There are also "global attributes", which may be produced by different MCCs depending on the configuration. The keys of such attributes are NOT prefixed by the name of the producing MCC. Before any new global attribute is introduced, it must be agreed upon by the core development team and added below. The global attributes decided so far are:

- `Request-URI` Identifies the service to which the message shall be sent. This attribute is produced by e.g. the HTTP MCC and used by the plexer for routing the message to the appropriate service.

5.185.2 Constructor & Destructor Documentation

5.185.2.1 Arc::MessageAttributes::MessageAttributes ( )

The default constructor.

This is the default constructor of the MessageAttributes class. It constructs an empty object that initially contains no attributes.

5.185.3 Member Function Documentation

5.185.3.1 void Arc::MessageAttributes::add (const std::string & *key*, const std::string & *value*)

Adds a value to an attribute.

This method adds a new value to an attribute. Any previous value will be preserved, i.e. the attribute may become multiple valued.

Parameters

key	The key of the attribute.
value	The (new) value of the attribute.

5.185.3.2 int Arc::MessageAttributes::count (const std::string & *key*) const

Returns the number of values of an attribute.

Returns the number of values of an attribute that matches a certain key.

Parameters

key	The key of the attribute for which to count values.

Returns

The number of values that corresponds to the key.

5.185.3.3 const std::string& Arc::MessageAttributes::get (const std::string & *key*) const

Returns the value of a single-valued attribute.

This method returns the value of a single-valued attribute. If the attribute is not single valued (i.e. there is no such attribute or it is a multiple-valued attribute) an empty string is returned.

Parameters

key	The key of the attribute for which to return the value.

Returns

The value of the attribute.

5.185.3.4 AttributeIterator Arc::MessageAttributes::getAll (const std::string & *key*) const

Access the value(s) of an attribute.

This method returns an AttributeIterator that can be used to access the values of an attribute.

Parameters

key	The key of the attribute for which to return the values.

Returns

An AttributeIterator for access of the values of the attribute.

5.185.3.5 void Arc::MessageAttributes::remove (const std::string & *key*, const std::string & *value*)

Removes one value of an attribute.

This method removes a certain value from the attribute that matches a certain key.

Parameters

key	The key of the attribute from which the value shall be removed.
value	The value to remove.

5.185.3.6 void Arc::MessageAttributes::removeAll (const std::string & *key*)

Removes all attributes with a certain key.

This method removes all attributes that match a certain key.

Parameters

key	The key of the attributes to remove.

5.185.3.7 void Arc::MessageAttributes::set (const std::string & *key*, const std::string & *value*)

Sets a unique value of an attribute.

This method removes any previous value of an attribute and sets the new value as the only value.

Parameters

key	The key of the attribute.
value	The (new) value of the attribute.

5.185.4 Field Documentation

5.185.4.1 AttrMap Arc::MessageAttributes::attributes_ [protected]

Internal storage of attributes.

An AttrMap (multimap) in which all attributes (key-value pairs) are stored.

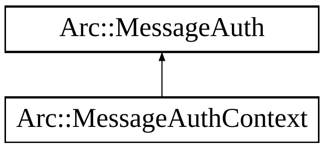
The documentation for this class was generated from the following file:

- MessageAttributes.h

5.186 Arc::MessageAuth Class Reference

`#include <MessageAuth.h>`

Inheritance diagram for Arc::MessageAuth:



Public Member Functions

- void set (const std::string &key, SecAttr ∗value)
- void remove (const std::string &key)
- SecAttr ∗ get (const std::string &key)
- SecAttr ∗ operator[] (const std::string &key)
- bool Export (SecAttrFormat format, XMLNode &val) const
- MessageAuth ∗ Filter (const std::list< std::string > &selected_keys, const std::list< std::string > &rejected_keys)

5.186.1 Detailed Description

Contains authencity information, authorization tokens and decisions.

This class only supports string keys and SecAttr values.

5.186.2 Member Function Documentation

5.186.2.1 bool Arc::MessageAuth::Export (SecAttrFormat *format*, XMLNode & *val*) const

Returns properly catenated attributes in specified format.

Content of XML node at is replaced with generated information if XML tree is empty. If tree at is not empty then Export() tries to merge generated information to already existing like everything would be generated inside same Export() method. If does not represent valid node then new XML tree is created.

5.186.2.2 MessageAuth∗ Arc::MessageAuth::Filter (const std::list< std::string > & *selected_keys*, const std::list< std::string > & *rejected_keys*)

Creates new instance of MessageAuth with attributes filtered.

In new instance all attributes with keys listed in are removed. If is not empty only corresponding attributes are transferred to new instance. Created instance does not own refered attributes. Hence parent instance must not be deleted as long as this one is in use.

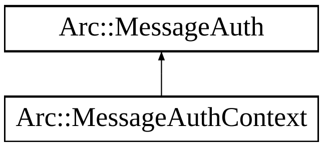
The documentation for this class was generated from the following file:

- MessageAuth.h

5.187 Arc::MessageAuthContext Class Reference

```
#include <Message.h>
```

Inheritance diagram for Arc::MessageAuthContext:



5.187.1 Detailed Description

Handler for content of message auth∗ context.

This class is a container for authorization and authentication information. It gets associated with Message object usually by first MCC in a chain and is kept as long as connection persists.

The documentation for this class was generated from the following file:

- Message.h

5.188 Arc::MessageContext Class Reference

```
#include <Message.h>
```

Public Member Functions

- void Add (const std::string &name, MessageContextElement ∗element)

5.188.1 Detailed Description

Handler for content of message context.

This class is a container for objects derived from MessageContextElement. It gets associated with Message object usually by first MCC in a chain and is kept as long as connection persists.

5.188.2 Member Function Documentation

5.188.2.1 void Arc::MessageContext::Add (const std::string & *name*, MessageContextElement ∗ *element*)

Provided element is taken over by this class. It is remembered by it and destroyed when this class is destroyed.

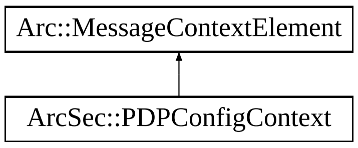
The documentation for this class was generated from the following file:

- Message.h

5.189 Arc::MessageContextElement Class Reference

```
#include <Message.h>
```

Inheritance diagram for Arc::MessageContextElement:



5.189.1 Detailed Description

Top class for elements contained in message context.

Objects of classes inherited with this one may be stored in MessageContext container.

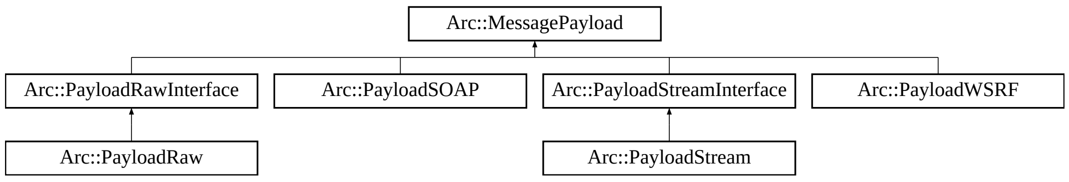
The documentation for this class was generated from the following file:

- Message.h

5.190 Arc::MessagePayload Class Reference

```
#include <Message.h>
```

Inheritance diagram for Arc::MessagePayload:



5.190.1 Detailed Description

Base class for content of message passed through chain.

It's not intended to be used directly. Instead functional classes must be derived from it.

The documentation for this class was generated from the following file:

- Message.h

5.191 Arc::ModuleDesc Class Reference

```
#include <Plugin.h>
```

5.191.1 Detailed Description

Description of loadable module.

This class is used for reports

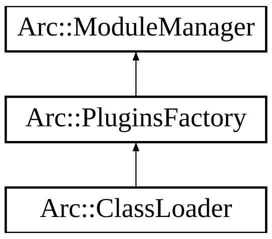
The documentation for this class was generated from the following file:

- Plugin.h

5.192 Arc::ModuleManager Class Reference

```
#include <ModuleManager.h>
```

Inheritance diagram for Arc::ModuleManager:



Public Member Functions

- ModuleManager (XMLNode cfg)
- Glib::Module ∗ load (const std::string &name, bool probe=false)
- std::string find (const std::string &name)
- Glib::Module ∗ reload (Glib::Module ∗module)
- void unload (Glib::Module ∗module)
- void unload (const std::string &name)
- std::string findLocation (const std::string &name)
- bool makePersistent (Glib::Module ∗module)
- bool makePersistent (const std::string &name)
- void setCfg (XMLNode cfg)

5.192.1 Detailed Description

Manager of shared libraries.

This class loads shared libraries/modules. There supposed to be created one instance of it per executable. In such circumstances it would cache handles to loaded modules and not load them multiple times.

5.192.2 Constructor & Destructor Documentation

5.192.2.1 Arc::ModuleManager::ModuleManager (XMLNode *cfg*)

Cache of handles of loaded modules Constructor. It is supposed to process correponding configuration subtree and tune module loading parameters accordingly.

5.192.3 Member Function Documentation

5.192.3.1 std::string Arc::ModuleManager::find (const std::string & *name*)

Finds loadable module by 'name' looking in same places as load() does, but does not load it.

5.192.3.2 std::string Arc::ModuleManager::findLocation (const std::string & *name*)

Finds shared library corresponding to module 'name' and returns path to it

5.192.3.3 Glib::Module∗ Arc::ModuleManager::load (const std::string & *name,* bool *probe* = `false`)

Finds module 'name' in cache or loads corresponding loadable module

5.192.3.4 bool Arc::ModuleManager::makePersistent (Glib::Module ∗ *module*)

Make sure this module is never unloaded. Even if unload() is called.

5.192.3.5 bool Arc::ModuleManager::makePersistent (const std::string & *name*)

Make sure this module is never unloaded. Even if unload() is called.

5.192.3.6 Glib::Module∗ Arc::ModuleManager::reload (Glib::Module ∗ *module*)

Reload module previously loaded in probe mode. New module is loaded with all symbols resolved and old module handler is unloaded. In case of error old module is not unloaded.

5.192.3.7 void Arc::ModuleManager::setCfg (XMLNode *cfg*)

Input the configuration subtree, and trigger the module loading (do almost the same as the Constructor); It is function desgined for ClassLoader to adopt the singleton pattern

5.192.3.8 void Arc::ModuleManager::unload (Glib::Module ∗ *module*)

Unload module by its identifier

5.192.3.9 void Arc::ModuleManager::unload (const std::string & *name*)

Unload module by its name

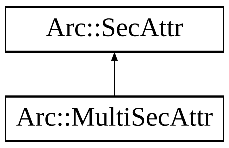
The documentation for this class was generated from the following file:

- ModuleManager.h

5.193 Arc::MultiSecAttr Class Reference

```
#include <SecAttr.h>
```

Inheritance diagram for Arc::MultiSecAttr:



Public Member Functions

- virtual operator bool () const
- virtual bool Export (SecAttrFormat format, XMLNode &val) const

5.193.1 Detailed Description

Container of multiple SecAttr attributes.

This class combines multiple attributes. It's export/import methods catenate results of underlying objects. Primary meaning of this class is to serve as base for classes implementing multi level hierarchical tree-like descriptions of user identity. It may also be used for collecting information of same source or kind. Like all information extracted from X509 certificate.

5.193.2 Member Function Documentation

5.193.2.1 virtual bool Arc::MultiSecAttr::Export (**SecAttrFormat** *format,* **XMLNode** & *val*) const [virtual]

Convert internal structure into specified format. Returns false if format is not supported/suitable for this attribute. XML node referenced by is turned into top level element of specified format.

Reimplemented from Arc::SecAttr.

5.193.2.2 virtual Arc::MultiSecAttr::operator bool ( ) const [virtual]

This function should return false if the value is to be considered null, e.g. if it hasn't been set or initialized. In other cases it should return true.

Reimplemented from Arc::SecAttr.

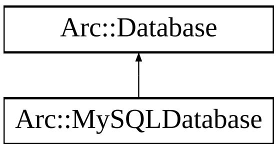
The documentation for this class was generated from the following file:

- SecAttr.h

5.194 Arc::MySQLDatabase Class Reference

`#include <MysqlWrapper.h>`

Inheritance diagram for Arc::MySQLDatabase:



Public Member Functions

- virtual bool connect (std::string &dbname, std::string &user, std::string &password)
- virtual bool isconnected () const
- virtual void close ()
- virtual bool enable_ssl (const std::string &keyfile="", const std::string &certfile="", const std::string &cafile="", const std::string &capath="")
- virtual bool shutdown ()

5.194.1 Detailed Description

Implement the database accessing interface in DBInterface.h by using mysql client library for accessing mysql database

5.194.2 Member Function Documentation

5.194.2.1 virtual void Arc::MySQLDatabase::close ( ) `[virtual]`

Close the connection with database server

Implements Arc::Database.

5.194.2.2 virtual bool Arc::MySQLDatabase::connect (std::string & *dbname*, std::string & *user*, std::string & *password*) `[virtual]`

Do connection with database server

Parameters

dbname	The database name which will be used.
user	The username which will be used to access database.
password	The password which will be used to access database.

Implements Arc::Database.

5.194.2.3 virtual bool Arc::MySQLDatabase::enable_ssl (const std::string & *keyfile* = "", const std::string & *certfile* = "", const std::string & *cafile* = "", const std::string & *capath* = "") [virtual]

Enable ssl communication for the connection

Parameters

keyfile	The location of key file.
certfile	The location of certificate file.
cafile	The location of ca file.
capath	The location of ca directory

Implements Arc::Database.

5.194.2.4 virtual bool Arc::MySQLDatabase::isconnected ( ) const [inline, virtual]

Get the connection status

Implements Arc::Database.

5.194.2.5 virtual bool Arc::MySQLDatabase::shutdown ( ) [virtual]

Ask database server to shutdown

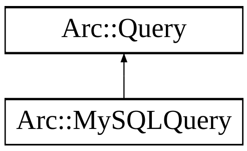
Implements Arc::Database.

The documentation for this class was generated from the following file:

- MysqlWrapper.h

5.195 Arc::MySQLQuery Class Reference

Inheritance diagram for Arc::MySQLQuery:



Public Member Functions

- virtual int get_num_colums ()

- virtual int get_num_rows ()
- virtual bool execute (const std::string &sqlstr)
- virtual QueryRowResult get_row (int row_number) const
- virtual QueryRowResult get_row () const
- virtual std::string get_row_field (int row_number, std::string &field_name)
- virtual bool get_array (std::string &sqlstr, QueryArrayResult &result, std::vector< std::string > &arguments)

5.195.1 Member Function Documentation

5.195.1.1 virtual bool Arc::MySQLQuery::execute (const std::string & *sqlstr*) [virtual]

Execute the query

Parameters

sqlstr	The sql sentence used to query

Implements Arc::Query.

5.195.1.2 virtual bool Arc::MySQLQuery::get_array (std::string & *sqlstr,* QueryArrayResult & *result,* std::vector< std::string > & *arguments*) [virtual]

Query the database by using some parameters into sql sentence e.g. "select table.value from table where table.name = ?"

Parameters

sqlstr	The sql sentence with some parameters marked with "?".
result	The result in an array which includes all of the value in query result.
arguments	The argument list which should exactely correspond with the parametes in sql sentence.

Implements Arc::Query.

5.195.1.3 virtual int Arc::MySQLQuery::get_num_colums ( ) [virtual]

Get the colum number in the query result

Implements Arc::Query.

5.195.1.4 virtual int Arc::MySQLQuery::get_num_rows ( ) [virtual]

Get the row number in the query result

Implements Arc::Query.

5.195.1.5 virtual QueryRowResult Arc::MySQLQuery::get_row (int *row_number*) const [virtual]

Get the value of one row in the query result

Parameters

row_number	The number of the row

Returns

A vector includes all the values in the row

Implements Arc::Query.

5.195.1.6 virtual QueryRowResult Arc::MySQLQuery::get_row ( ) const [virtual]

Get the value of one row in the query result, the row number will be automatically increased each time the method is called

Implements Arc::Query.

5.195.1.7 virtual std::string Arc::MySQLQuery::get_row_field (int *row_number,* std::string & *field_name*) [virtual]

Get the value of one specific field in one specific row

Parameters

row_number	The row number inside the query result
field_name	The field name for the value which will be return

Returns

The value of the specified filed in the specified row

Implements Arc::Query.

The documentation for this class was generated from the following file:

- MysqlWrapper.h

5.196 Arc::NotificationType Class Reference

The documentation for this class was generated from the following file:

- JobDescription.h

5.197 Arc::NS Class Reference

Public Member Functions

- NS (void)
- NS (const char ∗prefix, const char ∗uri)
- NS (const char ∗nslist[ ][2])

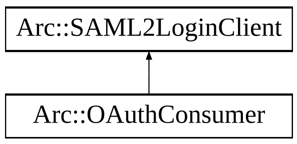
The documentation for this class was generated from the following file:

- XMLNode.h

5.198 Arc::OAuthConsumer Class Reference

`#include <OAuthConsumer.h>`

Inheritance diagram for Arc::OAuthConsumer:



Public Member Functions

- OAuthConsumer (const MCCConfig cfg, const URL url, std::list< std::string > idp_stack)
- MCC_Status parseDN (std::string ∗dn)
- MCC_Status approveCSR (const std::string approve_page)
- MCC_Status pushCSR (const std::string b64_pub_key, const std::string pub_key-_hash, std::string ∗approve_page)
- MCC_Status storeCert (const std::string cert_path, const std::string auth_token, const std::string b64_dn)

Protected Member Functions

- MCC_Status processLogin (const std::string username="", const std::string pass-word="")

5.198.1 Detailed Description

The OAuth functionality depends on the availability of the liboauth C-bindings library

5.198.2 Constructor & Destructor Documentation

5.198.2.1 Arc::OAuthConsumer::OAuthConsumer (const MCCConfig *cfg*, const URL *url*, std::list< std::string > *idp_stack*)

Construct an OAuth consumer with url as service provider. idp_name is currently ignored, since the idp to which the SAML2 redirect will take place is presently a hardcoded value on the SAML2 SP side. This is expected to change in the future.

5.198.3 Member Function Documentation

5.198.3.1 MCC_Status Arc::OAuthConsumer::approveCSR (const std::string *approve_page*) [virtual]

Unsupported placeholder function until Confusa supports OAuth.

Implements Arc::SAML2LoginClient.

5.198.3.2 MCC_Status Arc::OAuthConsumer::parseDN (std::string * *dn*) [virtual]

Unsupported placeholder function until Confusa supports OAuth.

Implements Arc::SAML2LoginClient.

5.198.3.3 MCC_Status Arc::OAuthConsumer::processLogin (const std::string *username* = "", const std::string *password* = "") [protected, virtual]

Main function performing all the OAuth login steps. Username and password will be ignored.

Implements Arc::SAML2LoginClient.

5.198.3.4 MCC_Status Arc::OAuthConsumer::pushCSR (const std::string *b64_pub_key*, const std::string *pub_key_hash*, std::string * *approve_page*) [virtual]

Unsupported placeholder function until Confusa supports OAuth.

Implements Arc::SAML2LoginClient.

5.198.3.5 MCC_Status Arc::OAuthConsumer::storeCert (const std::string *cert_path*, const std::string *auth_token*, const std::string *b64_dn*) [virtual]

Unsupported placeholder function until Confusa supports OAuth.

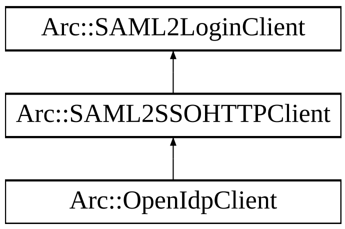
Implements Arc::SAML2LoginClient.

The documentation for this class was generated from the following file:

- OAuthConsumer.h

5.199 Arc::OpenIdpClient Class Reference

Inheritance diagram for Arc::OpenIdpClient:



Protected Member Functions

- MCC_Status processIdPLogin (const std::string username, const std::string password)
- MCC_Status processConsent ()
- MCC_Status processIdP2Confusa ()

5.199.1 Member Function Documentation

5.199.1.1 MCC_Status Arc::OpenIdpClient::processConsent ( ) [protected, virtual]

If the IdP has a consent module and the user has not saved her consent, this method will ask the user for consent to transmission of her data to Confusa

Implements Arc::SAML2SSOHTTPClient.

5.199.1.2 MCC_Status Arc::OpenIdpClient::processIdP2Confusa ( ) [protected, virtual]

Redirects the user back from identity provider to the Confusa SP

Implements Arc::SAML2SSOHTTPClient.

5.199.1.3 MCC_Status Arc::OpenIdpClient::processIdPLogin (const std::string *username*, const std::string *password*) [protected, virtual]

Actual identity provider parsers for next three methods implemented in subdirectory idp/

Parse identity provider login page and submit username and password in the previsioned way

Implements Arc::SAML2SSOHTTPClient.

The documentation for this class was generated from the following file:

- OpenIdpClient.h

5.200 Arc::OptIn Class Reference

The documentation for this class was generated from the following file:

- JobDescription.h

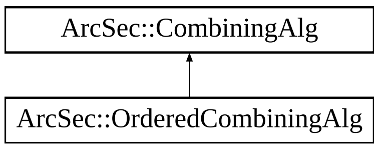
5.201 Arc::OptionParser Class Reference

The documentation for this class was generated from the following file:

- OptionParser.h

5.202 ArcSec::OrderedCombiningAlg Class Reference

Inheritance diagram for ArcSec::OrderedCombiningAlg:



The documentation for this class was generated from the following file:

- OrderedAlg.h

5.203 Arc::OutputFileType Class Reference

The documentation for this class was generated from the following file:

- JobDescription.h

5.204 Arc::ParallelEnvironmentType Class Reference

The documentation for this class was generated from the following file:

- JobDescription.h

5.205 passwd Struct Reference

The documentation for this struct was generated from the following file:

- win32.h

5.206 Arc::PathIterator Class Reference

```
#include <URL.h>
```

Public Member Functions

- PathIterator (const std::string &path, bool end=false)
- PathIterator & operator++ ()
- PathIterator & operator-- ()
- operator bool () const
- std::string operator∗ () const
- std::string Rest () const

5.206.1 Detailed Description

Class to iterate through elements of path.

5.206.2 Constructor & Destructor Documentation

5.206.2.1 Arc::PathIterator::PathIterator (const std::string & *path*, bool *end* = `false`)

Constructor accepts path and stores it internally. If end is set to false iterator is pointing at first element in path. Otherwise selected element is one before last.

5.206.3 Member Function Documentation

5.206.3.1 Arc::PathIterator::operator bool ( ) const

Return false when iterator moved outside path elements

5.206.3.2 std::string Arc::PathIterator::operator∗ ( ) const

Returns part of initial path from first till and including current

5.206.3.3 PathIterator& Arc::PathIterator::operator++ ( )

Advances iterator to point at next path element

5.206.3.4 PathIterator& Arc::PathIterator::operator-- ( )

Moves iterator to element before current

5.206.3.5 std::string Arc::PathIterator::Rest ( ) const

Returns part of initial path from one after current till end

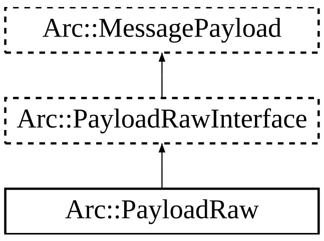
The documentation for this class was generated from the following file:

- URL.h

5.207 Arc::PayloadRaw Class Reference

`#include <PayloadRaw.h>`

Inheritance diagram for Arc::PayloadRaw:



Public Member Functions

- PayloadRaw (void)
- virtual ∼PayloadRaw (void)
- virtual char operator[] (Size_t pos) const
- virtual char ∗ Content (Size_t pos=-1)
- virtual Size_t Size (void) const
- virtual char ∗ Insert (Size_t pos=0, Size_t size=0)
- virtual char ∗ Insert (const char ∗s, Size_t pos=0, Size_t size=-1)
- virtual char ∗ Buffer (unsigned int num=0)
- virtual Size_t BufferSize (unsigned int num=0) const
- virtual Size_t BufferPos (unsigned int num=0) const
- virtual bool Truncate (Size_t size)

5.207.1 Detailed Description

Raw byte multi-buffer.

This is implementation of PayloadRawInterface. Buffers are memory blocks logically placed one after another.

5.207.2 Constructor & Destructor Documentation

5.207.2.1 Arc::PayloadRaw::PayloadRaw (void) [inline]

List of handled buffers. Constructor. Created object contains no buffers.

5.207.2.2 virtual Arc::PayloadRaw::∼PayloadRaw (void) [virtual]

Destructor. Frees allocated buffers.

5.207.3 Member Function Documentation

5.207.3.1 virtual char∗ Arc::PayloadRaw::Buffer (unsigned int *num* = 0) [virtual]

Returns pointer to num'th buffer

Implements Arc::PayloadRawInterface.

5.207.3.2 virtual Size_t Arc::PayloadRaw::BufferPos (unsigned int *num* = 0) const [virtual]

Returns position of num'th buffer

Implements Arc::PayloadRawInterface.

5.207.3.3 virtual Size_t Arc::PayloadRaw::BufferSize (unsigned int *num* = 0) const [virtual]

Returns length of num'th buffer

Implements Arc::PayloadRawInterface.

5.207.3.4 virtual char∗ Arc::PayloadRaw::Content (Size_t *pos* = -1) [virtual]

Get pointer to buffer content at global position 'pos'. By default to beginning of main buffer whatever that means.

Implements Arc::PayloadRawInterface.

5.207.3.5 virtual char∗ Arc::PayloadRaw::Insert (Size_t *pos* = 0, Size_t *size* = 0) [virtual]

Create new buffer at global position 'pos' of size 'size'.

Implements Arc::PayloadRawInterface.

5.207.3.6 virtual char∗ Arc::PayloadRaw::Insert (const char ∗ *s*, Size_t *pos* = 0, Size_t *size* = -1) [virtual]

Create new buffer at global position 'pos' of size 'size'. Created buffer is filled with content of memory at 's'. If 'size' is negative content at 's' is expected to be null-terminated.

Implements Arc::PayloadRawInterface.

5.207.3.7 virtual char Arc::PayloadRaw::operator[] (Size_t *pos*) const [virtual]

Returns content of byte at specified position. Specified position 'pos' is treated as global one and goes through all buffers placed one after another.

Implements Arc::PayloadRawInterface.

5.207.3.8 virtual Size_t Arc::PayloadRaw::Size (void) const [virtual]

Returns logical size of whole structure.

Implements Arc::PayloadRawInterface.

5.207.3.9 virtual bool Arc::PayloadRaw::Truncate (Size_t *size*) [virtual]

Change size of stored information. If size exceeds end of allocated buffer, buffers are not re-allocated, only logical size is extended. Buffers with location behind new size are deallocated.

Implements Arc::PayloadRawInterface.

The documentation for this class was generated from the following file:

- PayloadRaw.h

5.208 Arc::PayloadRawBuf Struct Reference

Data Fields

- int size
- int length
- bool allocated

5.208.1 Field Documentation

5.208.1.1 bool Arc::PayloadRawBuf::allocated

size of used memory - size of buffer

5.208.1.2 int Arc::PayloadRawBuf::length

size of allocated memory

5.208.1.3 int Arc::PayloadRawBuf::size

pointer to buffer in memory

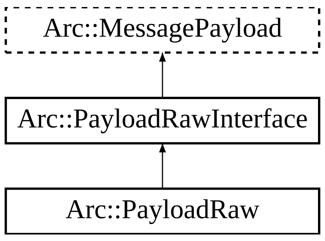
The documentation for this struct was generated from the following file:

- PayloadRaw.h

5.209 Arc::PayloadRawInterface Class Reference

`#include <PayloadRaw.h>`

Inheritance diagram for Arc::PayloadRawInterface:



Public Member Functions

- virtual char operator[] (Size_t pos) const =0
- virtual char ∗ Content (Size_t pos=-1)=0
- virtual Size_t Size (void) const =0
- virtual char ∗ Insert (Size_t pos=0, Size_t size=0)=0
- virtual char ∗ Insert (const char ∗s, Size_t pos=0, Size_t size=-1)=0
- virtual char ∗ Buffer (unsigned int num)=0
- virtual Size_t BufferSize (unsigned int num) const =0
- virtual Size_t BufferPos (unsigned int num) const =0
- virtual bool Truncate (Size_t size)=0

5.209.1 Detailed Description

Random Access Payload for Message objects.

This class is a virtual interface for managing Message payload with arbitrarily accessible content. Inheriting classes are supposed to implement memory-resident or memory-mapped content made of optionally multiple chunks/buffers. Every buffer has own size and offset. This class is purely virtual.

5.209.2 Member Function Documentation

5.209.2.1 virtual char∗ Arc::PayloadRawInterface::Buffer (unsigned int *num*) [pure virtual]

Returns pointer to num'th buffer

Implemented in Arc::PayloadRaw.

5.209.2.2 virtual Size_t Arc::PayloadRawInterface::BufferPos (unsigned int *num*) const [pure virtual]

Returns position of num'th buffer

Implemented in Arc::PayloadRaw.

5.209.2.3 virtual Size_t Arc::PayloadRawInterface::BufferSize (unsigned int *num*) const [pure virtual]

Returns length of num'th buffer

Implemented in Arc::PayloadRaw.

5.209.2.4 virtual char∗ Arc::PayloadRawInterface::Content (Size_t *pos* = -1) [pure virtual]

Get pointer to buffer content at global position 'pos'. By default to beginning of main buffer whatever that means.

Implemented in Arc::PayloadRaw.

5.209.2.5 virtual char∗ Arc::PayloadRawInterface::Insert (Size_t *pos* = 0, Size_t *size* = 0) [pure virtual]

Create new buffer at global position 'pos' of size 'size'.

Implemented in Arc::PayloadRaw.

5.209.2.6 virtual char∗ Arc::PayloadRawInterface::Insert (const char ∗ *s*, Size_t *pos* = 0, Size_t *size* = -1) [pure virtual]

Create new buffer at global position 'pos' of size 'size'. Created buffer is filled with content of memory at 's'. If 'size' is negative content at 's' is expected to be null-terminated.

Implemented in Arc::PayloadRaw.

5.209.2.7 virtual char Arc::PayloadRawInterface::operator[] (Size_t *pos*) const `[pure virtual]`

Returns content of byte at specified position. Specified position 'pos' is treated as global one and goes through all buffers placed one after another.

Implemented in Arc::PayloadRaw.

5.209.2.8 virtual Size_t Arc::PayloadRawInterface::Size (void) const `[pure virtual]`

Returns logical size of whole structure.

Implemented in Arc::PayloadRaw.

5.209.2.9 virtual bool Arc::PayloadRawInterface::Truncate (Size_t *size*) `[pure virtual]`

Change size of stored information. If size exceeds end of allocated buffer, buffers are not re-allocated, only logical size is extended. Buffers with location behind new size are deallocated.

Implemented in Arc::PayloadRaw.

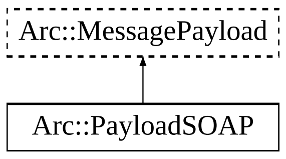
The documentation for this class was generated from the following file:

- PayloadRaw.h

5.210 Arc::PayloadSOAP Class Reference

`#include <PayloadSOAP.h>`

Inheritance diagram for Arc::PayloadSOAP:



Public Member Functions

- PayloadSOAP (const NS &ns, bool fault=false)
- PayloadSOAP (const SOAPEnvelope &soap)
- PayloadSOAP (const MessagePayload &source)

5.210.1 Detailed Description

Payload of Message with SOAP content.

This class combines MessagePayload with SOAPEnvelope to make it possible to pass SOAP messages through MCC chain.

5.210.2 Constructor & Destructor Documentation

5.210.2.1 Arc::PayloadSOAP::PayloadSOAP (const NS & *ns*, bool *fault* = `false`)

Constructor - creates new Message payload

5.210.2.2 Arc::PayloadSOAP::PayloadSOAP (const SOAPEnvelope & *soap*)

Constructor - creates Message payload from SOAP document. Provided SOAP document is copied to new object.

5.210.2.3 Arc::PayloadSOAP::PayloadSOAP (const MessagePayload & *source*)

Constructor - creates SOAP message from payload. PayloadRawInterface and derived classes are supported.

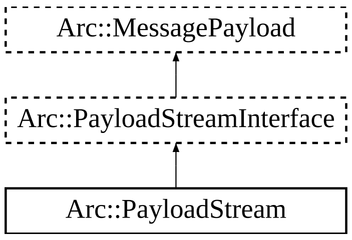
The documentation for this class was generated from the following file:

- PayloadSOAP.h

5.211 Arc::PayloadStream Class Reference

`#include <PayloadStream.h>`

Inheritance diagram for Arc::PayloadStream:



Public Member Functions

- PayloadStream (int h=-1)
- virtual ∼PayloadStream (void)

- virtual bool Get (char ∗buf, int &size)
- virtual bool Get (std::string &buf)
- virtual std::string Get (void)
- virtual bool Put (const char ∗buf, Size_t size)
- virtual bool Put (const std::string &buf)
- virtual bool Put (const char ∗buf)
- virtual operator bool (void)
- virtual bool operator! (void)
- virtual int Timeout (void) const
- virtual void Timeout (int to)
- virtual Size_t Pos (void) const
- virtual Size_t Size (void) const
- virtual Size_t Limit (void) const

Protected Attributes

- int handle_
- bool seekable_

5.211.1 Detailed Description

POSIX handle as Payload.

This is an implemetation of PayloadStreamInterface for generic POSIX handle.

5.211.2 Constructor & Destructor Documentation

5.211.2.1 Arc::PayloadStream::PayloadStream (int *h* = `-1`)

true if lseek operation is applicable to open handle Constructor. Attaches to already open handle. Handle is not managed by this class and must be closed by external code.

5.211.2.2 virtual Arc::PayloadStream::∼PayloadStream (void) `[inline, virtual]`

Destructor.

5.211.3 Member Function Documentation

5.211.3.1 virtual bool Arc::PayloadStream::Get (char ∗ *buf,* int & *size*) `[virtual]`

Extracts information from stream up to 'size' bytes. 'size' contains number of read bytes on exit. Returns true in case of success.

Implements Arc::PayloadStreamInterface.

5.211.3.2 virtual bool Arc::PayloadStream::Get (std::string & *buf*) [virtual]

Read as many as possible (sane amount) of bytes into buf.

Implements Arc::PayloadStreamInterface.

5.211.3.3 virtual std::string Arc::PayloadStream::Get (void) [inline, virtual]

Read as many as possible (sane amount) of bytes.

Implements Arc::PayloadStreamInterface.

References Arc::string(), and Get().

Referenced by Get().

5.211.3.4 virtual Size_t Arc::PayloadStream::Limit (void) const [inline, virtual]

Returns position at which stream reading will stop if supported. That may be not same as Size() if instance is meant to provide access to only part of underlying obejct.

Implements Arc::PayloadStreamInterface.

5.211.3.5 virtual Arc::PayloadStream::operator bool (void) [inline, virtual]

Returns true if stream is valid.

Implements Arc::PayloadStreamInterface.

References handle_.

5.211.3.6 virtual bool Arc::PayloadStream::operator! (void) [inline, virtual]

Returns true if stream is invalid.

Implements Arc::PayloadStreamInterface.

References handle_.

5.211.3.7 virtual Size_t Arc::PayloadStream::Pos (void) const [inline, virtual]

Returns current position in stream if supported.

Implements Arc::PayloadStreamInterface.

5.211.3.8 virtual bool Arc::PayloadStream::Put (const char * *buf*, Size_t *size*) [virtual]

Push 'size' bytes from 'buf' into stream. Returns true on success.

Implements Arc::PayloadStreamInterface.

5.211.3.9 virtual bool Arc::PayloadStream::Put (const std::string & *buf*) [inline, virtual]

Push information from 'buf' into stream. Returns true on success.

Implements Arc::PayloadStreamInterface.

References Put().

Referenced by Put().

5.211.3.10 virtual bool Arc::PayloadStream::Put (const char ∗ *buf*) [inline, virtual]

Push null terminated information from 'buf' into stream. Returns true on success.

Implements Arc::PayloadStreamInterface.

References Put().

Referenced by Put().

5.211.3.11 virtual Size_t Arc::PayloadStream::Size (void) const [inline, virtual]

Returns size of underlying object if supported.

Implements Arc::PayloadStreamInterface.

5.211.3.12 virtual int Arc::PayloadStream::Timeout (void) const [inline, virtual]

Query current timeout for Get() and Put() operations.

Implements Arc::PayloadStreamInterface.

5.211.3.13 virtual void Arc::PayloadStream::Timeout (int *to*) [inline, virtual]

Set current timeout for Get() and Put() operations.

Implements Arc::PayloadStreamInterface.

5.211.4 Field Documentation

5.211.4.1 int Arc::PayloadStream::handle_ [protected]

Timeout for read/write operations

Referenced by operator bool(), and operator!().

5.211.4.2 bool Arc::PayloadStream::seekable_ [protected]

Handle for operations

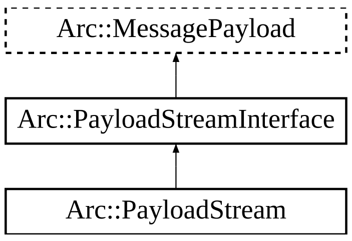
The documentation for this class was generated from the following file:

- PayloadStream.h

5.212 Arc::PayloadStreamInterface Class Reference

```
#include <PayloadStream.h>
```

Inheritance diagram for Arc::PayloadStreamInterface:



Public Member Functions

- virtual bool Get (char *buf, int &size)=0
- virtual bool Get (std::string &buf)=0
- virtual std::string Get (void)=0
- virtual bool Put (const char *buf, Size_t size)=0
- virtual bool Put (const std::string &buf)=0
- virtual bool Put (const char *buf)=0
- virtual operator bool (void)=0
- virtual bool operator! (void)=0
- virtual int Timeout (void) const =0
- virtual void Timeout (int to)=0
- virtual Size_t Pos (void) const =0
- virtual Size_t Size (void) const =0
- virtual Size_t Limit (void) const =0

5.212.1 Detailed Description

Stream-like Payload for Message object.

This class is a virtual interface for managing stream-like source and destination. It's supposed to be passed through MCC chain as payload of Message. It must be treated by MCCs and Services as dynamic payload. This class is purely virtual.

5.212.2 Member Function Documentation

5.212.2.1 virtual bool Arc::PayloadStreamInterface::Get (char ∗ *buf,* int & *size*) [pure virtual]

Extracts information from stream up to 'size' bytes. 'size' contains number of read bytes on exit. Returns true in case of success.

Implemented in Arc::PayloadStream.

5.212.2.2 virtual bool Arc::PayloadStreamInterface::Get (std::string & *buf*) [pure virtual]

Read as many as possible (sane amount) of bytes into buf.

Implemented in Arc::PayloadStream.

5.212.2.3 virtual std::string Arc::PayloadStreamInterface::Get (void) [pure virtual]

Read as many as possible (sane amount) of bytes.

Implemented in Arc::PayloadStream.

5.212.2.4 virtual Size_t Arc::PayloadStreamInterface::Limit (void) const [pure virtual]

Returns position at which stream reading will stop if supported. That may be not same as Size() if instance is meant to provide access to only part of underlying obejct.

Implemented in Arc::PayloadStream.

5.212.2.5 virtual Arc::PayloadStreamInterface::operator bool (void) [pure virtual]

Returns true if stream is valid.

Implemented in Arc::PayloadStream.

5.212.2.6 virtual bool Arc::PayloadStreamInterface::operator! (void) [pure virtual]

Returns true if stream is invalid.

Implemented in Arc::PayloadStream.

5.212.2.7 virtual Size_t Arc::PayloadStreamInterface::Pos (void) const [pure virtual]

Returns current position in stream if supported.

Implemented in Arc::PayloadStream.

5.212.2.8 virtual bool Arc::PayloadStreamInterface::Put (const char ∗ *buf*, Size_t *size*) [pure virtual]

Push 'size' bytes from 'buf' into stream. Returns true on success.

Implemented in Arc::PayloadStream.

5.212.2.9 virtual bool Arc::PayloadStreamInterface::Put (const std::string & *buf*) [pure virtual]

Push information from 'buf' into stream. Returns true on success.

Implemented in Arc::PayloadStream.

5.212.2.10 virtual bool Arc::PayloadStreamInterface::Put (const char ∗ *buf*) [pure virtual]

Push null terminated information from 'buf' into stream. Returns true on success.

Implemented in Arc::PayloadStream.

5.212.2.11 virtual Size_t Arc::PayloadStreamInterface::Size (void) const [pure virtual]

Returns size of underlying object if supported.

Implemented in Arc::PayloadStream.

5.212.2.12 virtual int Arc::PayloadStreamInterface::Timeout (void) const [pure virtual]

Query current timeout for Get() and Put() operations.

Implemented in Arc::PayloadStream.

5.212.2.13 virtual void Arc::PayloadStreamInterface::Timeout (int *to*) [pure virtual]

Set current timeout for Get() and Put() operations.

Implemented in Arc::PayloadStream.

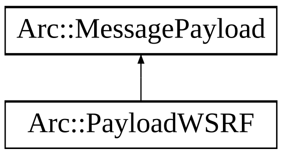
The documentation for this class was generated from the following file:

- PayloadStream.h

5.213 Arc::PayloadWSRF Class Reference

```
#include <PayloadWSRF.h>
```

Inheritance diagram for Arc::PayloadWSRF:



Public Member Functions

- PayloadWSRF (const SOAPEnvelope &soap)
- PayloadWSRF (WSRF &wsrp)
- PayloadWSRF (const MessagePayload &source)

5.213.1 Detailed Description

This class combines MessagePayload with WSRF.

It's intention is to make it possible to pass WSRF messages through MCC chain as one more Payload type.

5.213.2 Constructor & Destructor Documentation

5.213.2.1 Arc::PayloadWSRF::PayloadWSRF (const SOAPEnvelope & *soap*)

Constructor - creates Message payload from SOAP message. Returns invalid WSRF if SOAP does not represent WS-ResourceProperties

5.213.2.2 Arc::PayloadWSRF::PayloadWSRF (WSRF & *wsrp*)

Constructor - creates Message payload with acquired WSRF message. WSRF message will be destroyed by destructor of this object.

5.213.2.3 Arc::PayloadWSRF::PayloadWSRF (const MessagePayload & *source*)

Constructor - creates WSRF message from payload. All classes derived from SOAP-Envelope are supported.

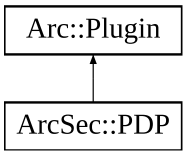
The documentation for this class was generated from the following file:

- PayloadWSRF.h

5.214 ArcSec::PDP Class Reference

`#include <PDP.h>`

Inheritance diagram for ArcSec::PDP:



5.214.1 Detailed Description

Base class for Policy Decision Point plugins.

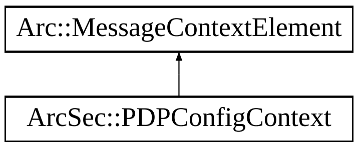
This virtual class defines method isPermitted() which processes security related information/attributes in Message and makes security decision - permit (true) or deny (false). Configuration of PDP is consumed during creation of instance through XML subtree fed to constructor.

The documentation for this class was generated from the following file:

- PDP.h

5.215 ArcSec::PDPConfigContext Class Reference

Inheritance diagram for ArcSec::PDPConfigContext:

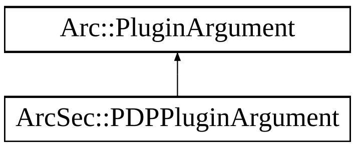


The documentation for this class was generated from the following file:

- PDP.h

5.216 ArcSec::PDPPluginArgument Class Reference

Inheritance diagram for ArcSec::PDPPluginArgument:



The documentation for this class was generated from the following file:

- PDP.h

5.217 Arc::Period Class Reference

Public Member Functions

- Period ()
- Period (time_t)
- Period (time_t seconds, uint32_t nanoseconds)
- Period (const std::string &, PeriodBase base=PeriodSeconds)
- Period & operator= (time_t)
- Period & operator= (const Period &)
- void SetPeriod (time_t)
- time_t GetPeriod () const
- const sigc::slot< const char * > * istr () const
- operator std::string () const
- bool operator< (const Period &) const
- bool operator> (const Period &) const
- bool operator<= (const Period &) const
- bool operator>= (const Period &) const
- bool operator== (const Period &) const
- bool operator!= (const Period &) const

5.217.1 Constructor & Destructor Documentation

5.217.1.1 Arc::Period::Period ( )

Default constructor. The period is set to 0 length.

5.217.1.2 Arc::Period::Period (time_t)

Constructor that takes a time_t variable and stores it.

5.217.1.3 Arc::Period::Period (time_t *seconds*, uint32_t *nanoseconds*)

Constructor that takes seconds and nanoseconds and stores them.

5.217.1.4 Arc::Period::Period (const std::string & , PeriodBase *base* = `PeriodSeconds`)

Constructor that tries to convert a string.

5.217.2 Member Function Documentation

5.217.2.1 time_t Arc::Period::GetPeriod ( ) const

gets the period

5.217.2.2 const sigc::slot<const char*>* Arc::Period::istr ( ) const

For use with IString

5.217.2.3 Arc::Period::operator std::string ( ) const

Returns a string representation of the period.

5.217.2.4 bool Arc::Period::operator!= (const Period &) const

Comparing two Period objects.

5.217.2.5 bool Arc::Period::operator< (const Period &) const

Comparing two Period objects.

5.217.2.6 bool Arc::Period::operator<= (const Period &) const

Comparing two Period objects.

5.217.2.7 Period& Arc::Period::operator= (time_t)

Assignment operator from a time_t.

5.217.2.8 Period& Arc::Period::operator= (const Period &)

Assignment operator from a Period.

5.217.2.9 bool Arc::Period::operator== (const Period &) const

Comparing two Period objects.

5.217.2.10 bool Arc::Period::operator> (const Period &) const

Comparing two Period objects.

5.217.2.11 bool Arc::Period::operator>= (const Period &) const

Comparing two Period objects.

5.217.2.12 void Arc::Period::SetPeriod (time_t)

sets the period

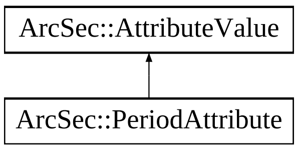
The documentation for this class was generated from the following file:

- DateTime.h

5.218 ArcSec::PeriodAttribute Class Reference

`#include <DateTimeAttribute.h>`

Inheritance diagram for ArcSec::PeriodAttribute:



Public Member Functions

- virtual bool equal (AttributeValue ∗other, bool check_id=true)
- virtual std::string encode ()
- virtual std::string getType ()
- virtual std::string getId ()

5.218.1 Detailed Description

Formate: datetime"/"duration datetime"/"datetime duration"/"datetime

5.218.2 Member Function Documentation

5.218.2.1 virtual std::string ArcSec::PeriodAttribute::encode ( ) [virtual]

encode the value in a string format

Implements ArcSec::AttributeValue.

5.218.2.2 virtual bool ArcSec::PeriodAttribute::equal (AttributeValue ∗ *value*, bool *check_id* = true) [virtual]

Evluate whether "this" equale to the parameter value

Implements ArcSec::AttributeValue.

5.218.2.3 virtual std::string ArcSec::PeriodAttribute::getId ( ) [inline, virtual]

Get the AttributeId of the <Attribute>

Implements ArcSec::AttributeValue.

5.218.2.4 virtual std::string ArcSec::PeriodAttribute::getType ( ) [inline, virtual]

Get the DataType of the <Attribute>

Implements ArcSec::AttributeValue.

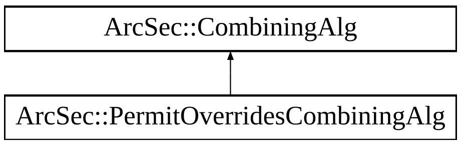
The documentation for this class was generated from the following file:

- DateTimeAttribute.h

5.219 ArcSec::PermitOverridesCombiningAlg Class Reference

`#include <PermitOverridesAlg.h>`

Inheritance diagram for ArcSec::PermitOverridesCombiningAlg:



Public Member Functions

- virtual Result combine (EvaluationCtx ∗ctx, std::list< Policy ∗ > policies)
- virtual const std::string & getalgId (void) const

5.219.1 Detailed Description

Implement the "Permit-Overrides" algorithm.

Permit-Overrides, scans the policy set which is given as the parameters of "combine" method, if gets "permit" result from any policy, then stops scanning and gives "permit" as result, otherwise gives "deny".

5.219.2 Member Function Documentation

5.219.2.1 virtual Result ArcSec::PermitOverridesCombiningAlg::combine (**EvaluationCtx** ∗ *ctx*, std::list< **Policy** ∗ > *policies*) `[virtual]`

If there is one policy which return positive evaluation result, then omit the other policies and return DECISION_PERMIT

Parameters

ctx	This object contains request information which will be used to evaluated against policy.
policlies	This is a container which contains policy objects.

Returns

The combined result according to the algorithm.

Implements ArcSec::CombiningAlg.

5.219.2.2 virtual const std::string& ArcSec::PermitOverridesCombiningAlg::getalgId (void) const `[inline, virtual]`

Get the identifier

Implements ArcSec::CombiningAlg.

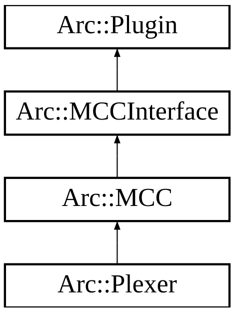
The documentation for this class was generated from the following file:

- PermitOverridesAlg.h

5.220 Arc::Plexer Class Reference

`#include <Plexer.h>`

Inheritance diagram for Arc::Plexer:



Public Member Functions

- Plexer (Config ∗cfg)
- virtual ∼Plexer ()
- virtual void Next (MCCInterface ∗next, const std::string &label)
- virtual MCC_Status process (Message &request, Message &response)

Static Public Attributes

- static Logger logger

5.220.1 Detailed Description

The Plexer class, used for routing messages to services.

This is the Plexer class. Its purpose is to route incoming messages to appropriate Services and MCC chains.

5.220.2 Constructor & Destructor Documentation

5.220.2.1 Arc::Plexer::Plexer (**Config** ∗ *cfg*)

The constructor.

This is the constructor. Since all member variables are instances of "well-behaving" STL classes, nothing needs to be done.

5.220.2.2 virtual Arc::Plexer::∼Plexer ( ) `[virtual]`

The destructor.

This is the destructor. Since all member variables are instances of "well-behaving" STL classes, nothing needs to be done.

5.220.3 Member Function Documentation

5.220.3.1 virtual void Arc::Plexer::Next (**MCCInterface** ∗ *next*, const std::string & *label*) [virtual]

Add reference to next MCC in chain.

This method is called by Loader for every potentially labeled link to next component which implements MCCInterface. If next is set NULL corresponding link is removed.

Reimplemented from Arc::MCC.

5.220.3.2 virtual **MCC_Status** Arc::Plexer::process (**Message** & *request*, **Message** & *response*) [virtual]

Route request messages to appropriate services.

Routes the request message to the appropriate service. Routing is based on the path part of value of the ENDPOINT attribute. Routed message is assigned following attributes: PLEXER:PATTERN - matched pattern, PLEXER:EXTENSION - last unmatched part of ENDPOINT path.

Reimplemented from Arc::MCC.

5.220.4 Field Documentation

5.220.4.1 **Logger Arc::Plexer::logger** [static]

A logger for MCCs.

A logger intended to be the parent of loggers in the different MCCs.

Reimplemented from Arc::MCC.

The documentation for this class was generated from the following file:

- Plexer.h

5.221 Arc::PlexerEntry Class Reference

```
#include <Plexer.h>
```

5.221.1 Detailed Description

A pair of label (regex) and pointer to MCC.

A helper class that stores a label (regex) and a pointer to a service.

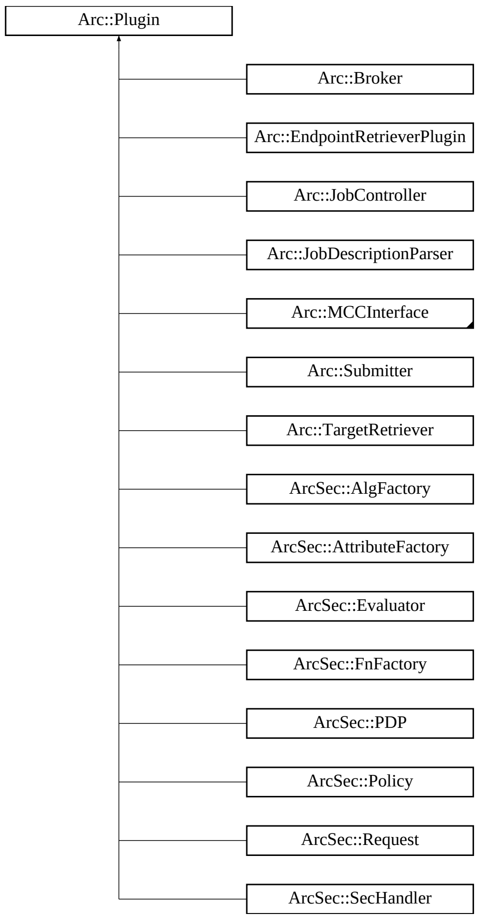
The documentation for this class was generated from the following file:

- Plexer.h

5.222 Arc::Plugin Class Reference

`#include <Plugin.h>`

Inheritance diagram for Arc::Plugin:



5.222.1 Detailed Description

Base class for loadable ARC components.

All classes representing loadable ARC components must be either descendants of this class or be wrapped by its offspring.

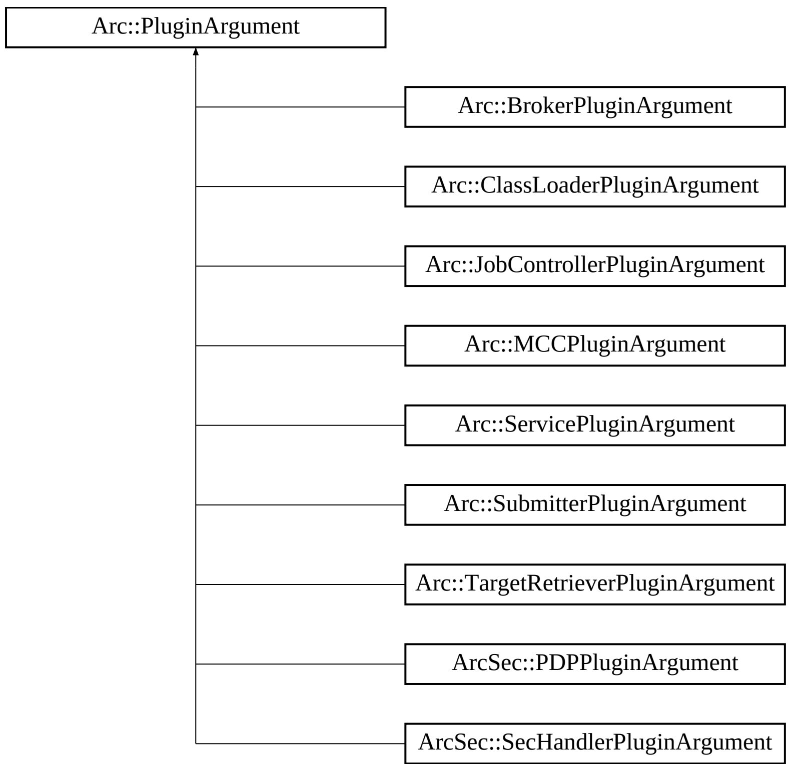
The documentation for this class was generated from the following file:

- Plugin.h

5.223 Arc::PluginArgument Class Reference

```
#include <Plugin.h>
```

Inheritance diagram for Arc::PluginArgument:


Arc::PluginArgument
Arc::BrokerPluginArgument
Arc::ClassLoaderPluginArgument
Arc::JobControllerPluginArgument
Arc::MCCPluginArgument
Arc::ServicePluginArgument
Arc::SubmitterPluginArgument
Arc::TargetRetrieverPluginArgument
ArcSec::PDPPluginArgument
ArcSec::SecHandlerPluginArgument

Public Member Functions

- PluginsFactory ∗ get_factory (void)
- Glib::Module ∗ get_module (void)

5.223.1 Detailed Description

Base class for passing arguments to loadable ARC components.

During its creation constructor function of ARC loadable component expects instance of class inherited from this one or wrapped in it. Then dynamic type casting is used for obtaining class of expected kind.

5.223.2 Member Function Documentation

5.223.2.1 PluginsFactory∗ Arc::PluginArgument::get_factory (void)

Returns pointer to factory which instantiated plugin.

Because factory usually destroys/unloads plugins in its destructor it should be safe to keep this pointer inside plugin for later use. But one must always check.

5.223.2.2 Glib::Module∗ Arc::PluginArgument::get_module (void)

Returns pointer to loadable module/library which contains plugin.

Corresponding factory keeps list of modules till itself is destroyed. So it should be safe to keep that pointer. But care must be taken if module contains persistent plugins. Such modules stay in memory after factory is detroyed. So it is advisable to use obtained pointer only in constructor function of plugin.

The documentation for this class was generated from the following file:

- Plugin.h

5.224 Arc::PluginDesc Class Reference

```
#include <Plugin.h>
```

5.224.1 Detailed Description

Description of plugin.

This class is used for reports

The documentation for this class was generated from the following file:

- Plugin.h

5.225 Arc::PluginDescriptor Struct Reference

```
#include <Plugin.h>
```

5.225.1 Detailed Description

Description of ARC lodable component.

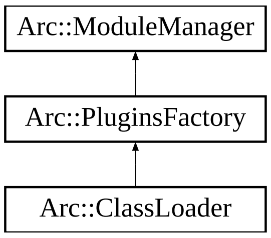
The documentation for this struct was generated from the following file:

- Plugin.h

5.226 Arc::PluginsFactory Class Reference

`#include <Plugin.h>`

Inheritance diagram for Arc::PluginsFactory:



Public Member Functions

- PluginsFactory (XMLNode cfg)
- void TryLoad (bool v=true)
- bool load (const std::string &name)
- bool scan (const std::string &name, ModuleDesc &desc)
- void report (std::list< ModuleDesc > &descs)

Static Public Member Functions

- static void FilterByKind (const std::string &kind, std::list< ModuleDesc > &descs)

5.226.1 Detailed Description

Generic ARC plugins loader.

The instance of this class provides functionality of loading pluggable ARC components stored in shared libraries. For more information please check HED documentation. This class is thread-safe - its methods are proceted from simultatneous use form multiple threads. Current thread protection implementation is suboptimal and will be revised in future.

5.226.2 Constructor & Destructor Documentation

5.226.2.1 Arc::PluginsFactory::PluginsFactory (XMLNode *cfg*)

Constructor - accepts configuration (not yet used) meant to tune loading of modules.

5.226.3 Member Function Documentation

5.226.3.1 static void Arc::PluginsFactory::FilterByKind (const std::string & *kind*, std::list< ModuleDesc > & *descs*) [static]

Filter list of modules by kind.

5.226.3.2 bool Arc::PluginsFactory::load (const std::string & *name*)

These methods load module named lib'name' and check if it contains ARC plugin(s) of specified 'kind' and 'name'. If there are no specified plugins or module does not contain any ARC plugins it is unloaded. All loaded plugins are also registered in internal list of this instance of PluginsFactory class. Returns true if any plugin was loaded.

5.226.3.3 void Arc::PluginsFactory::report (std::list< ModuleDesc > & *descs*)

Provides information about currently loaded modules and plugins.

5.226.3.4 bool Arc::PluginsFactory::scan (const std::string & *name*, ModuleDesc & *desc*)

Collect information about plugins stored in module(s) with specified names. Returns true if any of specified modules has plugins.

5.226.3.5 void Arc::PluginsFactory::TryLoad (bool *v* = `true`) [inline]

These methods load module named lib'name', locate plugin constructor functions of specified 'kind' and 'name' (if specified) and call it. Supplied argument affects way plugin instance is created in plugin-specific way. If name of plugin is not specified then all plugins of specified kind are tried with supplied argument till valid instance is created. All loaded plugins are also registered in internal list of this instance of PluginsFactory class. If search is set to false then no attempt is made to find plugins in loadable modules. Only plugins already loaded with previous calls to get_instance() and load() are checked. Returns created instance or NULL if failed. Specifies if loadable module may be loaded while looking for analyzing its content. If set to false only ∗.apd files are checked. Modules without corresponding ∗.apd will be ignored. Default is true;

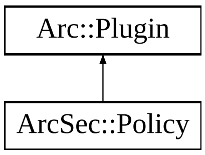
The documentation for this class was generated from the following file:

- Plugin.h

5.227 ArcSec::Policy Class Reference

```
#include <Policy.h>
```

Inheritance diagram for ArcSec::Policy:



Public Member Functions

- Policy ()
- Policy (const Arc::XMLNode)
- Policy (const Arc::XMLNode, EvaluatorContext ∗)
- virtual operator bool (void) const =0
- virtual MatchResult match (EvaluationCtx ∗)=0
- virtual Result eval (EvaluationCtx ∗)=0
- virtual void addPolicy (Policy ∗pl)
- virtual void setEvaluatorContext (EvaluatorContext ∗)
- virtual void make_policy ()
- virtual std::string getEffect () const =0
- virtual EvalResult & getEvalResult ()=0
- virtual void setEvalResult (EvalResult &res)=0
- virtual const char ∗ getEvalName () const =0
- virtual const char ∗ getName () const =0

5.227.1 Detailed Description

Interface for containing and processing different types of policy.

Basically, each policy object is a container which includes a few elements e.g., ArcPolicySet objects includes a few ArcPolicy objects; ArcPolicy object includes a few -ArcRule objects. There is logical relationship between ArcRules or ArcPolicies, which is called combining algorithm. According to algorithm, evaluation results from the elements are combined, and then the combined evaluation result is returned to the up-level.

5.227.2 Constructor & Destructor Documentation

5.227.2.1 ArcSec::Policy::Policy (const Arc::XMLNode) [inline]

Template constructor - creates policy based on XML document.

If XML document is empty then empty policy is created. If it is not empty then it must be valid policy document - otherwise created object should be invalid.

5.227.2.2 ArcSec::Policy::Policy (const Arc::XMLNode , EvaluatorContext ∗) [inline]

Template constructor - creates policy based on XML document.

If XML document is empty then empty policy is created. If it is not empty then it must be valid policy document - otherwise created object should be invalid. This constructor is based on the policy node and i the EvaluatorContext which includes the factory objects for combining algorithm and function

5.227.3 Member Function Documentation

5.227.3.1 virtual void ArcSec::Policy::addPolicy (Policy ∗ *pl*) [inline, virtual]

Add a policy element to into "this" object

5.227.3.2 virtual Result ArcSec::Policy::eval (EvaluationCtx ∗) [pure virtual]

Evaluate policy For the <Rule> of Arc, only get the "Effect" from rules; For the <-Policy> of Arc, combine the evaluation result from <Rule>; For the <Rule> of XA-CML, evaluate the <Condition> node by using information from request, and use the "Effect" attribute of <Rule>; For the <Policy> of XACML, combine the evaluation result from <Rule>

5.227.3.3 virtual std::string ArcSec::Policy::getEffect ( ) const [pure virtual]

Get the "Effect" attribute

5.227.3.4 virtual const char∗ ArcSec::Policy::getEvalName ( ) const [pure virtual]

Get the name of Evaluator which can evaluate this policy

5.227.3.5 virtual EvalResult& ArcSec::Policy::getEvalResult ( ) [pure virtual]

Get eveluation result

5.227.3.6 virtual const char∗ ArcSec::Policy::getName ( ) const [pure virtual]

Get the name of this policy

5.227.3.7 virtual void ArcSec::Policy::make_policy ( ) [inline, virtual]

Parse XMLNode, and construct the low-level Rule object

5.227.3.8 virtual void ArcSec::Policy::setEvalResult (**EvalResult** & *res*) `[pure virtual]`

Set eveluation result

5.227.3.9 virtual void ArcSec::Policy::setEvaluatorContext (**EvaluatorContext** ∗) `[inline, virtual]`

Set Evaluator Context for the usage in creating low-level policy object

The documentation for this class was generated from the following file:

- Policy.h

5.228 ArcSec::PolicyStore::PolicyElement Class Reference

The documentation for this class was generated from the following file:

- PolicyStore.h

5.229 ArcSec::PolicyParser Class Reference

```
#include <PolicyParser.h>
```

Public Member Functions

- virtual Policy ∗ parsePolicy (const Source &source, std::string policyclassname, EvaluatorContext ∗ctx)

5.229.1 Detailed Description

A interface which will isolate the policy object from actual policy storage (files, urls, database)

Parse the policy from policy source (e.g. files, urls, database, etc.).

5.229.2 Member Function Documentation

5.229.2.1 virtual **Policy**∗ ArcSec::PolicyParser::parsePolicy (const **Source** & *source*, std::string *policyclassname*, **EvaluatorContext** ∗ *ctx*) `[virtual]`

Parse policy

Parameters

source	location of the policy
policyclass-name	name of the policy for ClassLoader
ctx	EvaluatorContext which includes the ∗∗Factory

The documentation for this class was generated from the following file:

- PolicyParser.h

5.230 ArcSec::PolicyStore Class Reference

```
#include <PolicyStore.h>
```

Data Structures

- class PolicyElement

Public Member Functions

- PolicyStore (const std::string &alg, const std::string &policyclassname, EvaluatorContext ∗ctx)

5.230.1 Detailed Description

Storage place for policy objects.

5.230.2 Constructor & Destructor Documentation

5.230.2.1 ArcSec::PolicyStore::PolicyStore (const std::string & *alg,* const std::string & *policyclassname,* EvaluatorContext ∗ *ctx*)

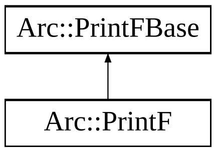
Creates policy store with specified combing algorithm (alg - not used yet), policy name (policyclassname) and context (ctx)

The documentation for this class was generated from the following file:

- PolicyStore.h

5.231 Arc::PrintF Class Reference

Inheritance diagram for Arc::PrintF:

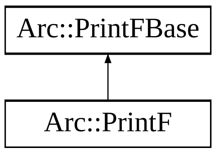


The documentation for this class was generated from the following file:

- IString.h

5.232 Arc::PrintFBase Class Reference

Inheritance diagram for Arc::PrintFBase:



The documentation for this class was generated from the following file:

- IString.h

5.233 AuthN::PrivateKeyInfoCodec Class Reference

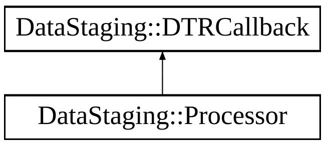
The documentation for this class was generated from the following file:

- nssprivkeyinfocodec.h

5.234 DataStaging::Processor Class Reference

```
#include <Processor.h>
```

Inheritance diagram for DataStaging::Processor:



Data Structures

- class BulkThreadArgument

  Class used to pass information to spawned thread (for bulk operations)
- class ThreadArgument

  Class used to pass information to spawned thread.

Public Member Functions

- Processor ()
- ∼Processor ()
- void start (void)
- void stop (void)
- virtual void receiveDTR (DTR_ptr dtr)

5.234.1 Detailed Description

The Processor performs pre- and post-transfer operations.

The Processor takes care of everything that should happen before and after a transfer takes place. Calling receiveDTR() spawns a thread to perform the required operation depending on the DTR state.

5.234.2 Member Function Documentation

5.234.2.1 virtual void DataStaging::Processor::receiveDTR (DTR_ptr *dtr*) `[virtual]`

Send a DTR to the Processor.

The DTR is sent to the Processor through this method when some long-latency processing is to be performed, eg contacting a remote service. The Processor spawns a thread to do the processing, and then returns. The thread notifies the scheduler when it is finished.

Implements DataStaging::DTRCallback.

5.234.2.2 void DataStaging::Processor::start (void)

Start Processor.

This method actually does nothing. It is here only to make all classes of data staging to look alike. But it is better to call it before starting to use object because it may do something in the future.

5.234.2.3 void DataStaging::Processor::stop (void)

Stop Processor.

This method sends waits for all started threads to end and exits. Since threads a short-lived it is better to wait rather than interrupt them.

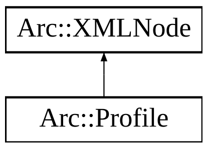
Referenced by ~Processor().

The documentation for this class was generated from the following file:

- Processor.h

5.235 Arc::Profile Class Reference

Inheritance diagram for Arc::Profile:



The documentation for this class was generated from the following file:

- Profile.h

5.236 ArcCredential::PROXYCERTINFO_st Struct Reference

The documentation for this struct was generated from the following file:

- Proxycertinfo.h

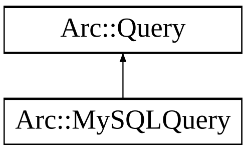
5.237 ArcCredential::PROXYPOLICY_st Struct Reference

The documentation for this struct was generated from the following file:

- Proxycertinfo.h

5.238 Arc::Query Class Reference

Inheritance diagram for Arc::Query:



Public Member Functions

- Query ()
- Query (Database ∗db)
- virtual ∼Query ()
- virtual int get_num_colums ()=0
- virtual int get_num_rows ()=0
- virtual bool execute (const std::string &sqlstr)=0
- virtual QueryRowResult get_row (int row_number) const =0
- virtual QueryRowResult get_row () const =0
- virtual std::string get_row_field (int row_number, std::string &field_name)=0
- virtual bool get_array (std::string &sqlstr, QueryArrayResult &result, std::vector< std::string > &arguments)=0

5.238.1 Constructor & Destructor Documentation

5.238.1.1 Arc::Query::Query ( ) `[inline]`

Default constructor

5.238.1.2 Arc::Query::Query (**Database** ∗ *db*) `[inline]`

Constructor

Parameters

db	The database object which will be used by Query class to get the database connection

5.238.1.3 virtual Arc::Query::∼Query ( ) `[inline, virtual]`

Deconstructor

5.238.2 Member Function Documentation

5.238.2.1 virtual bool Arc::Query::execute (const std::string & *sqlstr*) `[pure virtual]`

Execute the query

Parameters

sqlstr	The sql sentence used to query

Implemented in Arc::MySQLQuery.

5.238.2.2 virtual bool Arc::Query::get_array (std::string & *sqlstr*, QueryArrayResult & *result*, std::vector< std::string > & *arguments*) `[pure virtual]`

Query the database by using some parameters into sql sentence e.g. "select table.value from table where table.name = ?"

Parameters

sqlstr	The sql sentence with some parameters marked with "?".
result	The result in an array which includes all of the value in query result.
arguments	The argument list which should exactely correspond with the parametes in sql sentence.

Implemented in Arc::MySQLQuery.

5.238.2.3 virtual int Arc::Query::get_num_colums ( ) `[pure virtual]`

Get the colum number in the query result

Implemented in Arc::MySQLQuery.

5.238.2.4 virtual int Arc::Query::get_num_rows ( ) `[pure virtual]`

Get the row number in the query result

Implemented in Arc::MySQLQuery.

5.238.2.5 virtual QueryRowResult Arc::Query::get_row (int *row_number*) const `[pure virtual]`

Get the value of one row in the query result

Parameters

row_number	The number of the row

Returns

A vector includes all the values in the row

Implemented in Arc::MySQLQuery.

5.238.2.6 virtual QueryRowResult Arc::Query::get_row ( ) const [pure virtual]

Get the value of one row in the query result, the row number will be automatically increased each time the method is called

Implemented in Arc::MySQLQuery.

5.238.2.7 virtual std::string Arc::Query::get_row_field (int *row_number,* std::string & *field_name*) [pure virtual]

Get the value of one specific field in one specific row

Parameters

row_number	The row number inside the query result
field_name	The field name for the value which will be return

Returns

The value of the specified filed in the specified row

Implemented in Arc::MySQLQuery.

The documentation for this class was generated from the following file:

- DBInterface.h

5.239 Arc::Range Class Reference

The documentation for this class was generated from the following file:

- JobDescription.h

5.240 Arc::Register_Info_Type Struct Reference

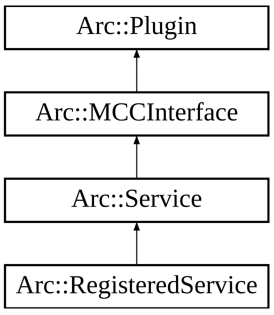
The documentation for this struct was generated from the following file:

- InfoRegister.h

5.241 Arc::RegisteredService Class Reference

`#include <RegisteredService.h>`

Inheritance diagram for Arc::RegisteredService:



Public Member Functions

- RegisteredService (Config ∗)

5.241.1 Detailed Description

RegisteredService - extension of Service performing self-registration.

5.241.2 Constructor & Destructor Documentation

5.241.2.1 Arc::RegisteredService::RegisteredService (**Config** ∗)

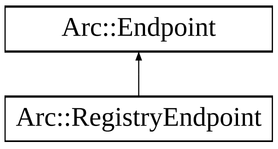
Example contructor - Server takes at least it's configuration subtree

The documentation for this class was generated from the following file:

- RegisteredService.h

5.242 Arc::RegistryEndpoint Class Reference

Inheritance diagram for Arc::RegistryEndpoint:



The documentation for this class was generated from the following file:

- Endpoint.h

5.243 Arc::RegularExpression Class Reference

```
#include <ArcRegex.h>
```

Public Member Functions

- RegularExpression ()
- RegularExpression (std::string pattern)
- RegularExpression (const RegularExpression &regex)
- ∼RegularExpression ()
- RegularExpression & operator= (const RegularExpression &regex)
- bool isOk ()
- bool hasPattern (std::string str)
- bool match (const std::string &str) const
- bool match (const std::string &str, std::list< std::string > &unmatched, std::list< std::string > &matched) const
- std::string getPattern () const

5.243.1 Detailed Description

A regular expression class.

This class is a wrapper around the functions provided in regex.h.

5.243.2 Member Function Documentation

5.243.2.1 bool Arc::RegularExpression::match (const std::string & *str,* std::list< std::string > & *unmatched,* std::list< std::string > & *matched*) const

Returns true if this regex matches the string provided.

Unmatched parts of the string are stored in 'unmatched'. Matched parts of the string are stored in 'matched'. The first entry in matched is the string that matched the regex, and the following entries are parenthesised elements of the regex

The documentation for this class was generated from the following file:

- ArcRegex.h

5.244 Arc::RemoteLoggingType Class Reference

```
#include <JobDescription.h>
```

Data Fields

- std::string ServiceType
- URL Location
- bool optional

5.244.1 Detailed Description

Remote logging.

This class is used to specify a service which should be used to report logging information to, such as job resource usage.

5.244.2 Field Documentation

5.244.2.1 URL Arc::RemoteLoggingType::Location

URL of logging service.

The Location URL specifies the URL of the service which job logging information should be sent to.

5.244.2.2 bool Arc::RemoteLoggingType::optional

Requirement satisfaction switch.

The optional boolean specifies whether the requirement specified in the particular object is mandatory for job execution, or whether it be ignored.

5.244.2.3 std::string Arc::RemoteLoggingType::ServiceType

Type of logging service.

The ServiceType string specifies the type of logging service. Some examples are "SG-AS" (`http://www.sgas.se`) and "APEL" (`https://wiki.egi.eu/wiki/APEL`), however please refer to the particular execution service for a list of supported logging service types.

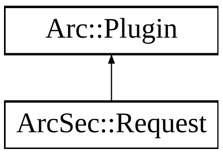
The documentation for this class was generated from the following file:

- JobDescription.h

5.245 ArcSec::Request Class Reference

```
#include <Request.h>
```

Inheritance diagram for ArcSec::Request:



Public Member Functions

- virtual ReqItemList getRequestItems () const
- virtual void setRequestItems (ReqItemList)
- virtual void addRequestItem (Attrs &, Attrs &, Attrs &, Attrs &)
- virtual void setAttributeFactory (AttributeFactory ∗attributefactory)=0
- virtual void make_request ()=0
- virtual const char ∗ getEvalName () const =0
- virtual const char ∗ getName () const =0
- Request ()
- Request (const Source &)

5.245.1 Detailed Description

Base class/Interface for request, includes a container for RequestItems and some operations.

A Request object can has a few <subjects, actions, objects> tuples, i.e. RequestItem The Request class and any customized class which inherit from it, should be loadable, which means these classes can be dynamically loaded according to the configuration informtation, see the example configuration below: <Service name="pdp.service" id="pdp_service"> <pdp:PDPConfig> <......> <pdp:Request name="arc.request" /> <......> </pdp:PDPConfig> </Service>

There can be different types of subclass which inherit Request, such like XACML-Request, ArcRequest, GACLRequest

5.245.2 Constructor & Destructor Documentation

5.245.2.1 ArcSec::Request::Request ( ) `[inline]`

Default constructor

5.245.2.2 ArcSec::Request::Request (const Source &) `[inline]`

Constructor: Parse request information from a xml stucture in memory

5.245.3 Member Function Documentation

5.245.3.1 virtual void ArcSec::Request::addRequestItem (Attrs & , Attrs & , Attrs & , Attrs &) `[inline, virtual]`

Add request tuple from non-XMLNode

5.245.3.2 virtual const char∗ ArcSec::Request::getEvalName ( ) const `[pure virtual]`

Get the name of corresponding evaulator

5.245.3.3 virtual const char∗ ArcSec::Request::getName ( ) const `[pure virtual]`

Get the name of this request

5.245.3.4 virtual ReqItemList ArcSec::Request::getRequestItems ( ) const `[inline, virtual]`

Get all the RequestItem inside RequestItem container

5.245.3.5 virtual void ArcSec::Request::make_request ( ) `[pure virtual]`

Create the objects included in Request according to the node attached to the Request object

5.245.3.6 virtual void ArcSec::Request::setAttributeFactory (AttributeFactory ∗ *attributefactory*) `[pure virtual]`

Set the attribute factory for the usage of Request

5.245.3.7 virtual void ArcSec::Request::setRequestItems (ReqItemList) `[inline, virtual]`

Set the content of the container

The documentation for this class was generated from the following file:

- Request.h

5.246 ArcSec::RequestAttribute Class Reference

```
#include <RequestAttribute.h>
```

Public Member Functions

- RequestAttribute (Arc::XMLNode &node, AttributeFactory ∗attrfactory)
- RequestAttribute & duplicate (RequestAttribute &)

5.246.1 Detailed Description

Wrapper which includes AttributeValue object which is generated according to date type of one spefic node in Request.xml.

5.246.2 Constructor & Destructor Documentation

5.246.2.1 ArcSec::RequestAttribute::RequestAttribute (Arc::XMLNode & *node*, AttributeFactory ∗ *attrfactory*)

Constructor - create attribute value object according to the "Type" in the node <Attribute attributeid="urn:arc:subject:voms-attribute" type="string">urn:mace-:shibboleth:examples</Attribute>

5.246.3 Member Function Documentation

5.246.3.1 RequestAttribute& ArcSec::RequestAttribute::duplicate (RequestAttribute &)

Duplicate the parameter into "this"

The documentation for this class was generated from the following file:

- RequestAttribute.h

5.247 ArcSec::RequestItem Class Reference

```
#include <RequestItem.h>
```

Public Member Functions

- RequestItem (Arc::XMLNode &, AttributeFactory ∗)

5.247.1 Detailed Description

Interface for request item container, <subjects, actions, objects, ctxs> tuple.

5.247.2 Constructor & Destructor Documentation

5.247.2.1 ArcSec::RequestItem::RequestItem (**Arc::XMLNode &** , **AttributeFactory** ∗) `[inline]`

Constructor

Parameters

node	The XMLNode structure of the request item
attributefac-tory	The AttributeFactory which will be used to generate RequestAttribute

The documentation for this class was generated from the following file:

- RequestItem.h

5.248 ArcSec::RequestTuple Class Reference

The documentation for this class was generated from the following file:

- EvaluationCtx.h

5.249 Arc::ResourcesType Class Reference

The documentation for this class was generated from the following file:

- JobDescription.h

5.250 ArcSec::Response Class Reference

`#include <Response.h>`

5.250.1 Detailed Description

Container for the evaluation results.

The documentation for this class was generated from the following file:

- Response.h

5.251 ArcSec::ResponseItem Class Reference

`#include <Response.h>`

5.251.1 Detailed Description

Evaluation result concerning one RequestTuple.

Include the RequestTuple, related XMLNode, the set of policy objects which give positive evaluation result, and the related XMLNode

The documentation for this class was generated from the following file:

- Response.h

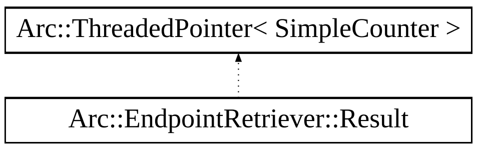
5.252 ArcSec::ResponseList Class Reference

The documentation for this class was generated from the following file:

- Response.h

5.253 Arc::EndpointRetriever::Result Class Reference

Inheritance diagram for Arc::EndpointRetriever::Result:


Arc::ThreadedPointer< SimpleCounter >
Arc::EndpointRetriever::Result

The documentation for this class was generated from the following file:

- EndpointRetriever.h

5.254 Arc::Run Class Reference

```
#include <Run.h>
```

Public Member Functions

- Run (const std::string &cmdline)
- Run (const std::list< std::string > &argv)
- ~Run (void)
- operator bool (void)
- bool operator! (void)
- bool Start (void)

- bool Wait (int timeout)
- bool Wait (void)
- int Result (void)
- bool Running (void)
- Time RunTime (void)
- Time ExitTime (void)
- int ReadStdout (int timeout, char ∗buf, int size)
- int ReadStderr (int timeout, char ∗buf, int size)
- int WriteStdin (int timeout, const char ∗buf, int size)
- void AssignStdout (std::string &str)
- void AssignStderr (std::string &str)
- void AssignStdin (std::string &str)
- void KeepStdout (bool keep=true)
- void KeepStderr (bool keep=true)
- void KeepStdin (bool keep=true)
- void CloseStdout (void)
- void CloseStderr (void)
- void CloseStdin (void)
- void AssignWorkingDirectory (std::string &wd)
- void Kill (int timeout)
- void Abandon (void)

Static Public Member Functions

- static void AfterFork (void)

5.254.1 Detailed Description

This class runs external executable. It is possible to read/write it's standard handles or to redirect then to std::string elements.

5.254.2 Constructor & Destructor Documentation

5.254.2.1 Arc::Run::Run (const std::string & *cmdline*)

Constructor preapres object to run cmdline

5.254.2.2 Arc::Run::Run (const std::list< std::string > & *argv*)

Constructor preapres object to run executable and arguments specified in argv

5.254.2.3 Arc::Run::∼Run (void)

Destructor kills running executable and releases associated resources

5.254.3 Member Function Documentation

5.254.3.1 void Arc::Run::Abandon (void)

Detach this object from running process. After calling this method instance is not associated with external process anymore. As result destructor will not kill process.

5.254.3.2 static void Arc::Run::AfterFork (void) [static]

Call this method after fork() in child cporocess. It will reinitialize internal structures for new environment. Do not call it in any other case than defined.

5.254.3.3 void Arc::Run::AssignStderr (std::string & *str*)

Associate stderr handle of executable with string. This method must be called before Start(). str object must be valid as long as this object exists.

5.254.3.4 void Arc::Run::AssignStdin (std::string & *str*)

Associate stdin handle of executable with string. This method must be called before Start(). str object must be valid as long as this object exists.

5.254.3.5 void Arc::Run::AssignStdout (std::string & *str*)

Associate stdout handle of executable with string. This method must be called before Start(). str object must be valid as long as this object exists.

5.254.3.6 void Arc::Run::AssignWorkingDirectory (std::string & *wd*) [inline]

Assign working direcotry of the running process

5.254.3.7 void Arc::Run::CloseStderr (void)

Closes pipe associated with stderr handle

5.254.3.8 void Arc::Run::CloseStdin (void)

Closes pipe associated with stdin handle

5.254.3.9 void Arc::Run::CloseStdout (void)

Closes pipe associated with stdout handle

5.254.3.10 Time Arc::Run::ExitTime (void) [inline]

Return when executable finished executing.

5.254.3.11 void Arc::Run::KeepStderr (bool *keep* = true)

Keep stderr same as parent's if keep = true

5.254.3.12 void Arc::Run::KeepStdin (bool *keep* = true)

Keep stdin same as parent's if keep = true

5.254.3.13 void Arc::Run::KeepStdout (bool *keep* = true)

Keep stdout same as parent's if keep = true

5.254.3.14 void Arc::Run::Kill (int *timeout*)

Kill running executable. First soft kill signal (SIGTERM) is sent to executable. If after timeout seconds executable is still running it's killed completely. Curently this method does not work for Windows OS

5.254.3.15 Arc::Run::operator bool (void) [inline]

Returns true if object is valid

5.254.3.16 bool Arc::Run::operator! (void) [inline]

Returns true if object is invalid

5.254.3.17 int Arc::Run::ReadStderr (int *timeout*, char * *buf*, int *size*)

Read from stderr handle of running executable. Parameter timeout specifies upper limit for which method will block in milliseconds. Negative means infinite. This method may be used while stderr is directed to string. But result is unpredictable. Returns number of read bytes.

5.254.3.18 int Arc::Run::ReadStdout (int *timeout*, char * *buf*, int *size*)

Read from stdout handle of running executable. Parameter timeout specifies upper limit for which method will block in milliseconds. Negative means infinite. This method may be used while stdout is directed to string. But result is unpredictable. Returns number of read bytes.

5.254.3.19 int Arc::Run::Result (void) [inline]

Returns exit code of execution.

5.254.3.20 bool Arc::Run::Running (void)

Return true if execution is going on.

5.254.3.21 Time Arc::Run::RunTime (void) [inline]

Return when executable was started.

5.254.3.22 bool Arc::Run::Start (void)

Starts running executable. This method may be called only once.

5.254.3.23 bool Arc::Run::Wait (int *timeout*)

Wait till execution finished or till timeout seconds expires. Returns true if execution is complete.

5.254.3.24 bool Arc::Run::Wait (void)

Wait till execution finished

5.254.3.25 int Arc::Run::WriteStdin (int *timeout,* const char ∗ *buf,* int *size*)

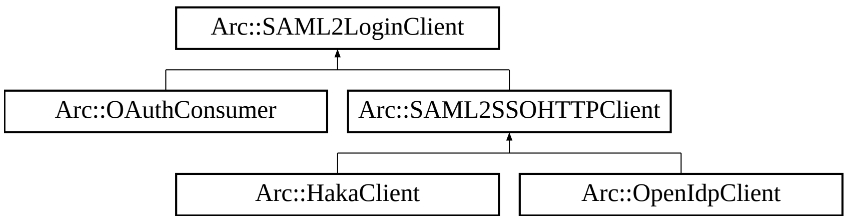
Write to stdin handle of running executable. Parameter timeout specifies upper limit for which method will block in milliseconds. Negative means infinite. This method may be used while stdin is directed to string. But result is unpredictable. Returns number of written bytes.

The documentation for this class was generated from the following file:

- Run.h

5.255 Arc::SAML2LoginClient Class Reference

Inheritance diagram for Arc::SAML2LoginClient:



Public Member Functions

- SAML2LoginClient (const MCCConfig cfg, const URL url, std::list< std::string > idp_stack)
- virtual MCC_Status processLogin (const std::string username="", const std::string password="")=0
- MCC_Status findSimpleSAMLInstallation ()

5.255.1 Constructor & Destructor Documentation

5.255.1.1 Arc::SAML2LoginClient::SAML2LoginClient (const **MCCConfig** *cfg,* const **URL** *url,* std::list< std::string > *idp_stack*)

list with the idp for nested wayf For example, Confusa can use betawayf.wayf.dk as an identity provider, which is itself only a wayf and shares the metadata with concrete service providers or even further nested wayfs. Since due to mutual authentication with metadata, we are obliged to follow the SSO redirects from WAYF to WAYF, the WAYFs are stored in a list.

5.255.2 Member Function Documentation

5.255.2.1 **MCC_Status** Arc::SAML2LoginClient::findSimpleSAMLInstallation ( )

find the location of the simplesamlphp installation on the SP side Will be stored in (∗sso-_pages)[SimpleSAML]

5.255.2.2 virtual **MCC_Status** Arc::SAML2LoginClient::processLogin (const std::string *username* = "", const std::string *password* = "") `[pure virtual]`

Base interface for all login procedures

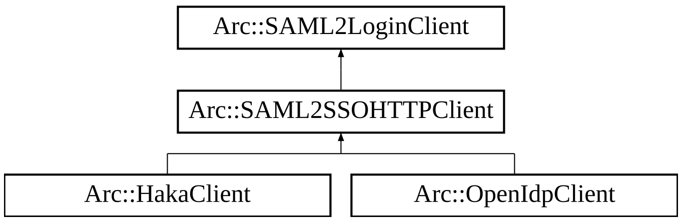
Implemented in Arc::SAML2SSOHTTPClient, and Arc::OAuthConsumer.

The documentation for this class was generated from the following file:

- SAML2LoginClient.h

5.256 Arc::SAML2SSOHTTPClient Class Reference

Inheritance diagram for Arc::SAML2SSOHTTPClient:



Public Member Functions

- MCC_Status processLogin (const std::string username, const std::string password)
- MCC_Status parseDN (std::string ∗dn)
- MCC_Status approveCSR (const std::string approve_page)
- MCC_Status pushCSR (const std::string b64_pub_key, const std::string pub_key_hash, std::string ∗approve_page)
- MCC_Status storeCert (const std::string cert_path, const std::string auth_token, const std::string b64_dn)

Protected Member Functions

- virtual MCC_Status processIdPLogin (const std::string username, const std::string password)=0
- virtual MCC_Status processConsent ()=0
- virtual MCC_Status processIdP2Confusa ()=0

5.256.1 Member Function Documentation

5.256.1.1 MCC_Status Arc::SAML2SSOHTTPClient::approveCSR (const std::string *approve_page*) [virtual]

Simulate click on the approve cert signing request link

Implements Arc::SAML2LoginClient.

5.256.1.2 MCC_Status Arc::SAML2SSOHTTPClient::parseDN (std::string ∗ *dn*) [virtual]

Parse the used DN from the Confusa about_you page

Implements Arc::SAML2LoginClient.

5.256.1.3 virtual MCC_Status Arc::SAML2SSOHTTPClient::processConsent ( ) [protected, pure virtual]

If the IdP has a consent module and the user has not saved her consent, this method will ask the user for consent to transmission of her data to Confusa

Implemented in Arc::HakaClient, and Arc::OpenIdpClient.

5.256.1.4 virtual MCC_Status Arc::SAML2SSOHTTPClient::processIdP2Confusa ( ) [protected, pure virtual]

Redirects the user back from identity provider to the Confusa SP

Implemented in Arc::HakaClient, and Arc::OpenIdpClient.

5.256.1.5 virtual MCC_Status Arc::SAML2SSOHTTPClient::processIdPLogin (const std::string *username*, const std::string *password*) [protected, pure virtual]

Actual identity provider parsers for next three methods implemented in subdirectory idp/

Parse identity provider login page and submit username and password in the previsioned way

Implemented in Arc::HakaClient, and Arc::OpenIdpClient.

5.256.1.6 MCC_Status Arc::SAML2SSOHTTPClient::processLogin (const std::string *username*, const std::string *password*) [virtual]

Models complete SAML2 WebSSO authN flow with start -> WAYF -> Login -> (consent) -> start

Implements Arc::SAML2LoginClient.

5.256.1.7 MCC_Status Arc::SAML2SSOHTTPClient::pushCSR (const std::string *b64_pub_key*, const std::string *pub_key_hash*, std::string ∗ *approve_page*) [virtual]

Send the cert signing request to Confusa for signing

Implements Arc::SAML2LoginClient.

5.256.1.8 MCC_Status Arc::SAML2SSOHTTPClient::storeCert (const std::string *cert_path*, const std::string *auth_token*, const std::string *b64_dn*) [virtual]

Download the signed certificate from Confusa and store it locally

Implements Arc::SAML2LoginClient.

The documentation for this class was generated from the following file:

- SAML2LoginClient.h

5.257 Arc::SAMLToken Class Reference

```
#include <SAMLToken.h>
```

Public Types

- enum SAMLVersion

Public Member Functions

- SAMLToken (SOAPEnvelope &soap)
- SAMLToken (SOAPEnvelope &soap, const std::string &certfile, const std::string &keyfile, SAMLVersion saml_version=SAML2, XMLNode saml_assertion=XMLNode())
- ~SAMLToken (void)
- operator bool (void)
- bool Authenticate (const std::string &cafile, const std::string &capath)
- bool Authenticate (void)

5.257.1 Detailed Description

Class for manipulating SAML Token Profile.

This class is for generating/consuming SAML Token profile. See WS-Security SAML Token Profile v1.1 (www.oasis-open.org/committees/wss) Currently this class is used by samltoken handler (will appears in src/hed/pdc/samltokensh/) It is not a must to directly called this class. If we need to use SAML Token functionality, we only need to configure the samltoken handler into service and client. Currently, only a minor part of the specification has been implemented.

About how to identify and reference security token for signing message, currently, only the "SAML Assertion Referenced from KeyInfo" (part 3.4.2 of WS-Security SAML Token Profile v1.1 specification) is supported, which means the implementation can only process SAML assertion "referenced from KeyInfo", and also can only generate SAML Token with SAML assertion "referenced from KeyInfo". More complete support need to implement.

About subject confirmation method, the implementation can process "hold-of-key" (part 3.5.1 of WS-Security SAML Token Profile v1.1 specification) subject subject confirmation method.

About SAML vertion, the implementation can process SAML assertion with SAML version 1.1 and 2.0; can only generate SAML assertion with SAML vertion 2.0.

In the SAML Token profile, for the hold-of-key subject confirmation method, there are three interaction parts: the attesting entity, the relying party and the issuing authority.

In the hold-of-key subject confirmation method, it is the attesting entity's subject identity which will be inserted into the SAML assertion.

Firstly the attesting entity authenticates to issuing authority by using some authentication scheme such as WSS x509 Token profile (Alterbatively the usename/password authentication scheme or other different authentication scheme can also be used, unless the issuing authority can retrive the key from a trusted certificate server after firmly establishing the subject's identity under the username/password scheme). So then issuing authority is able to make a definitive statement (sign a SAML assertion) about an act of authentication that has already taken place.

The attesting entity gets the SAML assertion and then signs the soap message together with the assertion by using its private key (the relevant certificate has been authenticated by issuing authority, and its relevant public key has been put into SubjectConfirmation element under saml assertion by issuing authority. Only the actual owner of the saml assertion can do this, as only the subject possesses the private key paired with the public key in the assertion. This establishes an irrefutable connection between the author of the SOAP message and the assertion describing an authentication event.)

The relying party is supposed to trust the issuing authority. When it receives a message from the asserting entity, it will check the saml assertion based on its predetermined trust relationship with the SAML issuing authority, and check the signature of the soap message based on the public key in the saml assertion without directly trust relationship with attesting entity (subject owner).

5.257.2 Member Enumeration Documentation

5.257.2.1 enum **Arc::SAMLToken::SAMLVersion**

Since the specfication SAMLVersion is for distinguishing two types of saml version. It is used as the parameter of constructor.

5.257.3 Constructor & Destructor Documentation

5.257.3.1 Arc::SAMLToken::SAMLToken (SOAPEnvelope & *soap*)

Constructor. Parse SAML Token information from SOAP header. SAML Token related information is extracted from SOAP header and stored in class variables. And then it the SAMLToken object will be used for authentication.

Parameters

soap	The SOAP message which contains the SAMLToken in the soap header

5.257.3.2 Arc::SAMLToken::SAMLToken (SOAPEnvelope & *soap*, const std::string & *certfile*, const std::string & *keyfile*, SAMLVersion *saml_version* = `SAML2`, XMLNode *saml_assertion* = XMLNode `()`)

Constructor. Add SAML Token information into the SOAP header. Generated token contains elements SAML token and signature, and is meant to be used for authentication on the consuming side. This constructor is for a specific SAML Token profile usage, in which the attesting entity signs the SAML assertion for itself (self-sign). This usage implicitly requires that the relying party trust the attesting entity. More general (requires issuing authority) usage will be provided by other constructor. And the under-developing SAML service will be used as the issuing authority.

Parameters

soap	The SOAP message to which the SAML Token will be inserted.
certfile	The certificate file.
keyfile	The key file which will be used to create signature.
samlversion	The SAML version, only SAML2 is supported currently.
samlassertion	The SAML assertion got from 3rd party, and used for protecting the SOAP message; If not present, then self-signed assertion will be generated.

5.257.3.3 Arc::SAMLToken::∼SAMLToken (void)

Deconstructor. Nothing to be done except finalizing the xmlsec library.

5.257.4 Member Function Documentation

5.257.4.1 bool Arc::SAMLToken::Authenticate (const std::string & *cafile*, const std::string & *capath*)

Check signature by using the trusted certificates It is used by relying parting after calling SAMLToken(SOAPEnvelope& soap) This method will check the SAML assertion based on the trusted certificated specified as parameter cafile or capath; and also check the signature to soap message (the signature is generated by attesting entity by signing soap body together witl SAML assertion) by using the public key inside SAML assetion.

Parameters

cafile	ca file
capath	ca directory

5.257.4.2 bool Arc::SAMLToken::Authenticate (void)

Check signature by using the cert information in soap message

5.257.4.3 Arc::SAMLToken::operator bool (void)

Returns true of constructor succeeded

The documentation for this class was generated from the following file:

- SAMLToken.h

5.258 Arc::ScalableTime Class Reference

The documentation for this class was generated from the following file:

- JobDescription.h

5.259 Arc::ScalableTime< int > Class Reference

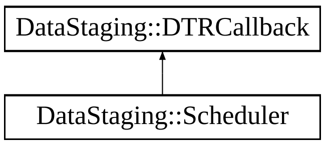
The documentation for this class was generated from the following file:

- JobDescription.h

5.260 DataStaging::Scheduler Class Reference

```
#include <Scheduler.h>
```

Inheritance diagram for DataStaging::Scheduler:



Public Member Functions

- Scheduler ()
- ~Scheduler ()
- void SetSlots (int pre_processor=0, int post_processor=0, int delivery=0, int emergency=0, int staged_prepared=0)
- void AddURLMapping (const Arc::URL &template_url, const Arc::URL &replacement_url, const Arc::URL &access_url=Arc::URL())
- void SetURLMapping (const Arc::URLMap &mapping=Arc::URLMap())
- void SetPreferredPattern (const std::string &pattern)
- void SetTransferSharesConf (const TransferSharesConf &share_conf)

- void SetTransferParameters (const TransferParameters &params)
- void SetDeliveryServices (const std::vector< Arc::URL > &endpoints)
- void SetDumpLocation (const std::string &location)
- bool start (void)
- virtual void receiveDTR (DTR_ptr dtr)
- bool cancelDTRs (const std::string &jobid)
- bool stop ()

5.260.1 Detailed Description

The Scheduler is the control centre of the data staging framework.

The Scheduler manages a global list of DTRs and schedules when they should go into the next state or be sent to other processes. The DTR priority is used to decide each DTR's position in a queue.

5.260.2 Member Function Documentation

5.260.2.1 virtual void DataStaging::Scheduler::receiveDTR (**DTR_ptr** *dtr*) `[virtual]`

Callback method implemented from DTRCallback.

This method is called by the generator when it wants to pass a DTR to the scheduler and when other processes send a DTR back to the scheduler after processing.

Implements DataStaging::DTRCallback.

5.260.2.2 bool DataStaging::Scheduler::start (void)

Start scheduling activity.

This method must be called after all configuration parameters are set properly. -Scheduler can be stopped either by calling stop() method or by destroying its instance.

5.260.2.3 bool DataStaging::Scheduler::stop ( )

Tell the Scheduler to shut down all threads and exit.

All active DTRs are cancelled and this method waits until they finish (all DTRs go to CANCELLED state)

Referenced by ∼Scheduler().

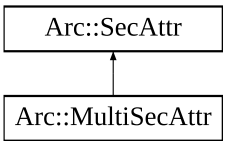
The documentation for this class was generated from the following file:

- Scheduler.h

5.261 Arc::SecAttr Class Reference

```
#include <SecAttr.h>
```

Inheritance diagram for Arc::SecAttr:



Public Member Functions

- SecAttr ()
- bool operator== (const SecAttr &b) const
- bool operator!= (const SecAttr &b) const
- virtual operator bool () const
- virtual bool Export (SecAttrFormat format, std::string &val) const
- virtual bool Export (SecAttrFormat format, XMLNode &val) const
- virtual bool Import (SecAttrFormat format, const std::string &val)
- virtual std::string get (const std::string &id) const
- virtual std::list< std::string > getAll (const std::string &id) const

Static Public Attributes

- static SecAttrFormat ARCAuth
- static SecAttrFormat XACML
- static SecAttrFormat SAML
- static SecAttrFormat GACL

5.261.1 Detailed Description

This is an abstract interface to a security attribute.

This class is meant to be inherited to implement security attributes. Depending on what data it needs to store inheriting classes may need to implement constructor and destructor. They must however override the equality and the boolean operators. The equality is meant to compare security attributes. The prototype implies that all attributes are comparable to all others. This behaviour should be modified as needed by using dynamic_cast operations. The boolean cast operation is meant to embody "nullness" if that is applicable to the particular type.

5.261.2 Member Function Documentation

5.261.2.1 virtual bool Arc::SecAttr::Export (SecAttrFormat *format,* std::string & *val*) const [virtual]

Convert internal structure into specified format. Returns false if format is not supported/suitable for this attribute.

5.261.2.2 virtual bool Arc::SecAttr::Export (SecAttrFormat *format,* XMLNode & *val*) const [virtual]

Convert internal structure into specified format. Returns false if format is not supported/suitable for this attribute. XML node referenced by is turned into top level element of specified format.

Reimplemented in Arc::MultiSecAttr.

5.261.2.3 virtual std::string Arc::SecAttr::get (const std::string & *id*) const [virtual]

Access to specific item of the security attribute. If there are few items of same id the first one is presented. It is meant to be used for tightly coupled SecHandlers and provides more effective interface than Export.

5.261.2.4 virtual std::list<std::string> Arc::SecAttr::getAll (const std::string & *id*) const [virtual]

Access to specific items of the security attribute. This method returns all items which have id assigned. It is meant to be used for tightly coupled SecHandlers and provides more effective interface than Export.

5.261.2.5 virtual bool Arc::SecAttr::Import (SecAttrFormat *format,* const std::string & *val*) [virtual]

Fills internal structure from external object of specified format. Returns false if failed to do. The usage pattern for this method is not defined and it is provided only to make class symmetric. Hence it's implementation is not required yet.

5.261.2.6 virtual Arc::SecAttr::operator bool ( ) const [virtual]

This function should return false if the value is to be considered null, e.g. if it hasn't been set or initialized. In other cases it should return true.

Reimplemented in Arc::MultiSecAttr.

5.261.2.7 bool Arc::SecAttr::operator!= (const SecAttr & *b*) const [inline]

This is a convenience function to allow the usage of "not equal" conditions and need not be overridden.

5.261.2.8 bool Arc::SecAttr::operator== (const SecAttr & *b*) const [inline]

This function should (in inheriting classes) return true if this and b are considered to represent same content. Identifying and restricting the type of b should be done using dynamic_cast operations. Currently it is not defined how comparison methods to be used. Hence their implementation is not required.

The documentation for this class was generated from the following file:

- SecAttr.h

5.262 Arc::SecAttrFormat Class Reference

`#include <SecAttr.h>`

5.262.1 Detailed Description

Export/import format.

Format is identified by textual identity string. Class description includes basic formats only. That list may be extended.

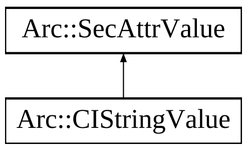
The documentation for this class was generated from the following file:

- SecAttr.h

5.263 Arc::SecAttrValue Class Reference

`#include <SecAttrValue.h>`

Inheritance diagram for Arc::SecAttrValue:



Public Member Functions

- bool operator== (SecAttrValue &b)

- bool operator!= (SecAttrValue &b)
- virtual operator bool ()

5.263.1 Detailed Description

This is an abstract interface to a security attribute.

This class is meant to be inherited to implement security attributes. Depending on what data it needs to store inheriting classes may need to implement constructor and destructor. They must however override the equality and the boolean operators. The equality is meant to compare security attributes. The prototype implies that all attributes are comparable to all others. This behaviour should be modified as needed by using dynamic_cast operations. The boolean cast operation is meant to embody "nullness" if that is applicable to the particular type.

5.263.2 Member Function Documentation

5.263.2.1 virtual Arc::SecAttrValue::operator bool ( ) `[virtual]`

This function should return false if the value is to be considered null, e g if it hasn't been set or initialized. In other cases it should return true.

Reimplemented in Arc::CIStringValue.

5.263.2.2 bool Arc::SecAttrValue::operator!= (SecAttrValue & *b*)

This is a convenience function to allow the usage of "not equal" conditions and need not be overridden.

5.263.2.3 bool Arc::SecAttrValue::operator== (SecAttrValue & *b*)

This function should (in inheriting classes) return true if this and b are considered to be the same. Identifying and restricting the type of b should be done using dynamic_cast operations.

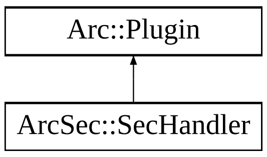
The documentation for this class was generated from the following file:

- SecAttrValue.h

5.264 ArcSec::SecHandler Class Reference

```
#include <SecHandler.h>
```

Inheritance diagram for ArcSec::SecHandler:



5.264.1 Detailed Description

Base class for simple security handling plugins.

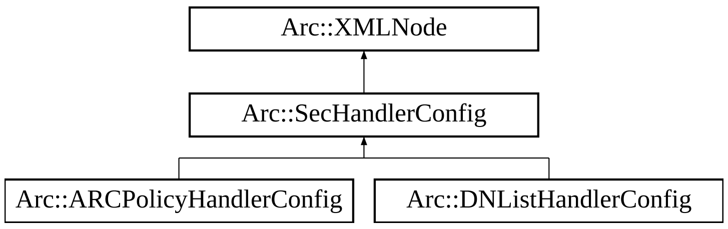
This virtual class defines method Handle() which processes security related information/attributes in Message and optionally makes security decision. Instances of such classes are normally arranged in chains abd are called on incoming and outgoing messages in various MCC and Service plugins. Return value of Handle() defines either processing should continie (true) or stop with error (false). Configuration of SecHandler is consumed during creation of instance through XML subtree fed to constructor.

The documentation for this class was generated from the following file:

- SecHandler.h

5.265 Arc::SecHandlerConfig Class Reference

Inheritance diagram for Arc::SecHandlerConfig:



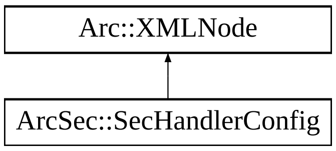
The documentation for this class was generated from the following file:

- ClientInterface.h

5.266 ArcSec::SecHandlerConfig Class Reference

```
#include <SecHandler.h>
```

Inheritance diagram for ArcSec::SecHandlerConfig:



5.266.1 Detailed Description

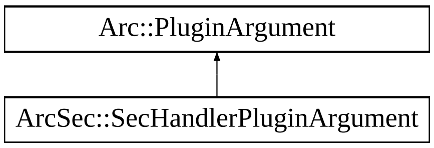
Helper class to create Security Handler configuration

The documentation for this class was generated from the following file:

- SecHandler.h

5.267 ArcSec::SecHandlerPluginArgument Class Reference

Inheritance diagram for ArcSec::SecHandlerPluginArgument:



The documentation for this class was generated from the following file:

- SecHandler.h

5.268 ArcSec::Security Class Reference

```
#include <Security.h>
```

5.268.1 Detailed Description

Common stuff used by security related slasses.

This class is just a place where to put common stuff that is used by security related slasses. So far it only contains a logger.

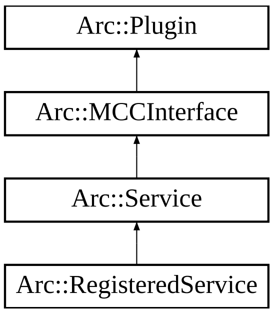
The documentation for this class was generated from the following file:

- Security.h

5.269 Arc::Service Class Reference

```
#include <Service.h>
```

Inheritance diagram for Arc::Service:



Public Member Functions

- Service (Config ∗)
- virtual void AddSecHandler (Config ∗cfg, ArcSec::SecHandler ∗sechandler, const std::string &label="")
- virtual bool RegistrationCollector (XMLNode &doc)
- virtual std::string getID ()
- operator bool () const
- bool operator! () const

Protected Member Functions

- bool ProcessSecHandlers (Message &message, const std::string &label="") const

Protected Attributes

- std::map< std::string, std::list< ArcSec::SecHandler ∗ > > sechandlers_
- bool valid

Static Protected Attributes

- static Logger logger

5.269.1 Detailed Description

Service - last component in a Message Chain.

This class which defines interface and common functionality for every Service plugin. Interface is made of method process() which is called by Plexer or MCC class. There is one Service object created for every service description processed by Loader class objects. Classes derived from Service class must implement process() method of MCC-Interface. It is up to developer how internal state of service is stored and communicated to other services and external utilities. Service is free to expect any type of payload passed to it and generate any payload as well. Useful types depend on MCCs in chain which leads to that service. For example if service is expected to by linked to SOA-P MCC it must accept and generate messages with PayloadSOAP payload. Method process() of class derived from Service class may be called concurrently in multiple threads. Developers must take that into account and write thread-safe implementation. Simple example of service is provided in /src/tests/echo/echo.cpp of source tree. The way to write client counterpart of corresponding service is undefined yet. For example see /src/tests/echo/test.cpp .

5.269.2 Constructor & Destructor Documentation

5.269.2.1 Arc::Service::Service (**Config** ∗)

Example constructor - Server takes at least its configuration subtree

5.269.3 Member Function Documentation

5.269.3.1 virtual void Arc::Service::AddSecHandler (**Config** ∗ *cfg*, **ArcSec::SecHandler** ∗ *sechandler*, const std::string & *label* = "") `[virtual]`

Add security components/handlers to this MCC. For more information please see description of MCC::AddSecHandler

5.269.3.2 virtual std::string Arc::Service::getID ( ) `[inline, virtual]`

Service may implement own service identifier gathering method. This method return identifier of service which is used for registering it Information Services.

5.269.3.3 Arc::Service::operator bool (void) const `[inline]`

Returns true if the Service is valid.

References valid.

5.269.3.4 bool Arc::Service::operator! (void) const `[inline]`

Returns true if the Service is not valid.

References valid.

5.269.3.5 bool Arc::Service::ProcessSecHandlers (Message & *message*, const std::string & *label* = "") const [protected]

Executes security handlers of specified queue. For more information please see description of MCC::ProcessSecHandlers

5.269.3.6 virtual bool Arc::Service::RegistrationCollector (XMLNode & *doc*) [virtual]

Service specific registration collector, used for generate service registrations. In implemented service this method should generate GLUE2 document with part of service description which service wishes to advertise to Information Services.

5.269.4 Field Documentation

5.269.4.1 Logger Arc::Service::logger [static, protected]

Logger object used to print messages generated by this class.

5.269.4.2 std::map<std::string,std::list<ArcSec::SecHandler*> > Arc::Service::sechandlers_ [protected]

Set of labelled authentication and authorization handlers. MCC calls sequence of handlers at specific point depending on associated identifier. in most aces those are "in" and "out" for incoming and outgoing messages correspondingly.

5.269.4.3 bool Arc::Service::valid [protected]

Is service valid? Services which are not valid should set this to false in their constructor.

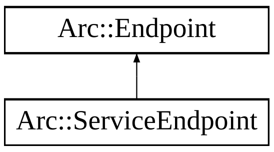
Referenced by operator bool(), and operator!().

The documentation for this class was generated from the following file:

- Service.h

5.270 Arc::ServiceEndpoint Class Reference

Inheritance diagram for Arc::ServiceEndpoint:



The documentation for this class was generated from the following file:

- Endpoint.h

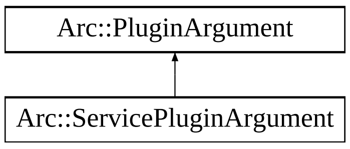
5.271 Arc::ServiceEndpointRetrieverPluginTESTControl Class - Reference

The documentation for this class was generated from the following file:

- TestACCControl.h

5.272 Arc::ServicePluginArgument Class Reference

Inheritance diagram for Arc::ServicePluginArgument:



The documentation for this class was generated from the following file:

- Service.h

5.273 Arc::SharedMutex Class Reference

The documentation for this class was generated from the following file:

- Thread.h

5.274 Arc::SimpleCondition Class Reference

```
#include <Thread.h>
```

Public Member Functions

- void lock (void)
- void unlock (void)
- void signal (void)

- void signal_nonblock (void)
- void broadcast (void)
- void wait (void)
- void wait_nonblock (void)
- bool wait (int t)
- void reset (void)

5.274.1 Detailed Description

Simple triggered condition.

Provides condition and semaphor objects in one element.

5.274.2 Member Function Documentation

5.274.2.1 void Arc::SimpleCondition::broadcast (void) [inline]

Signal about condition to all waiting threads. If there are no waiting threads, it works like signal().

5.274.2.2 void Arc::SimpleCondition::lock (void) [inline]

Acquire semaphor

5.274.2.3 void Arc::SimpleCondition::reset (void) [inline]

Reset object to initial state

5.274.2.4 void Arc::SimpleCondition::signal (void) [inline]

Signal about condition. This overrides broadcast().

5.274.2.5 void Arc::SimpleCondition::signal_nonblock (void) [inline]

Signal about condition without using semaphor. Call it ∗only∗ with lock acquired.

5.274.2.6 void Arc::SimpleCondition::unlock (void) [inline]

Release semaphor

5.274.2.7 void Arc::SimpleCondition::wait (void) [inline]

Wait for condition

5.274.2.8 bool Arc::SimpleCondition::wait (int *t*) [inline]

Wait for condition no longer than t milliseconds

5.274.2.9 void Arc::SimpleCondition::wait_nonblock (void) [inline]

Wait for condition without using semaphor. Call it ∗only∗ with lock acquired.

The documentation for this class was generated from the following file:

- Thread.h

5.275 Arc::SimpleCounter Class Reference

`#include <Thread.h>`

Public Member Functions

- virtual int inc (void)
- virtual int dec (void)
- virtual int get (void) const
- virtual int set (int v)
- virtual void wait (void) const
- virtual bool wait (int t) const
- virtual void forceReset (void)

5.275.1 Detailed Description

Thread-safe counter with capability to wait for zero value. It is extendable through re-implementation of virtual methods.

5.275.2 Member Function Documentation

5.275.2.1 virtual int Arc::SimpleCounter::dec (void) [virtual]

Decrement value of counter.

Returns new value. Does not go below 0 value.

5.275.2.2 virtual void Arc::SimpleCounter::forceReset (void) [inline, virtual]

This method is meant to be used only after fork.

It resets state of all internal locks and variables.

5.275.2.3 virtual int Arc::SimpleCounter::inc (void) [virtual]

Increment value of counter.

Returns new value.

5.275.2.4 virtual int Arc::SimpleCounter::set (int *v*) [virtual]

Set value of counter.

Returns new value.

5.275.2.5 virtual bool Arc::SimpleCounter::wait (int *t*) const [virtual]

Wait for zero condition no longer than t milliseconds.

If t is negative - wait forever.

The documentation for this class was generated from the following file:

- Thread.h

5.276 Arc::SlotRequirementType Class Reference

The documentation for this class was generated from the following file:

- JobDescription.h

5.277 Arc::SOAPMessage Class Reference

```
#include <SOAPMessage.h>
```

Public Member Functions

- SOAPMessage (void)
- SOAPMessage (long msg_ptr_addr)
- SOAPMessage (Message &msg)
- ~SOAPMessage (void)
- SOAPEnvelope ∗ Payload (void)
- void Payload (SOAPEnvelope ∗new_payload)
- MessageAttributes ∗ Attributes (void)

5.277.1 Detailed Description

Message restricted to SOAP payload.

This is a special Message intended to be used in language bindings for programming languages which are not flexible enough to support all kinds of Payloads. It is passed through chain of MCCs and works like the Message but can carry only SOAP content.

5.277.2 Constructor & Destructor Documentation

5.277.2.1 Arc::SOAPMessage::SOAPMessage (void) [inline]

Dummy constructor

5.277.2.2 Arc::SOAPMessage::SOAPMessage (long *msg_ptr_addr*)

Copy constructor. Used by language bindigs

5.277.2.3 Arc::SOAPMessage::SOAPMessage (Message & *msg*)

Copy constructor. Ensures shallow copy.

5.277.2.4 Arc::SOAPMessage::∼SOAPMessage (void)

Destructor does not affect refered objects

5.277.3 Member Function Documentation

5.277.3.1 MessageAttributes∗ Arc::SOAPMessage::Attributes (void) [inline]

Returns a pointer to the current attributes object or NULL if no attributes object has been assigned.

5.277.3.2 SOAPEnvelope∗ Arc::SOAPMessage::Payload (void)

Returns pointer to current payload or NULL if no payload assigned.

5.277.3.3 void Arc::SOAPMessage::Payload (SOAPEnvelope ∗ *new_payload*)

Replace payload with a COPY of new one

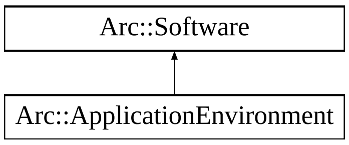
The documentation for this class was generated from the following file:

- SOAPMessage.h

5.278 Arc::Software Class Reference

```
#include <Software.h>
```

Inheritance diagram for Arc::Software:



Public Types

- enum ComparisonOperatorEnum { NOTEQUAL = 0, EQUAL = 1, GREATERTHAN = 2, LESSTHAN = 3, GREATERTHANOREQUAL = 4, LESSTHANOREQUAL = 5 }
- typedef bool(Software::∗ ComparisonOperator)(const Software &) const

Public Member Functions

- Software ()
- Software (const std::string &name_version)
- Software (const std::string &name, const std::string &version)
- Software (const std::string &family, const std::string &name, const std::string &version)
- bool empty () const
- bool operator== (const Software &sw) const
- bool operator!= (const Software &sw) const
- bool operator> (const Software &sw) const
- bool operator< (const Software &sw) const
- bool operator>= (const Software &sw) const
- bool operator<= (const Software &sw) const
- std::string operator() () const
- operator std::string (void) const
- const std::string & getFamily () const
- const std::string & getName () const
- const std::string & getVersion () const

Static Public Member Functions

- static ComparisonOperator convert (const ComparisonOperatorEnum &co)
- static std::string toString (ComparisonOperator co)

Static Public Attributes

- static const std::string VERSIONTOKENS

Friends

- std::ostream & operator<< (std::ostream &out, const Software &sw)

5.278.1 Detailed Description

Used to represent software (names and version) and comparison.

The Software class is used to represent the name of a piece of software internally. Generally software are identified by a name and possibly a version number. Some software can also be categorized by type or family (compilers, operating system, etc.). A software object can be compared to other software objects using the comparison operators contained in this class. The basic usage of this class is to test if some specified software requirement (SoftwareRequirement) are fulfilled, by using the comparability of the class.

Internally the Software object is represented by a family and name identifier, and the software version is tokenized at the characters defined in VERSIONTOKENS, and stored as a list of tokens.

5.278.2 Member Typedef Documentation

5.278.2.1 typedef bool(Software::∗ Arc::Software::ComparisonOperator)(const Software &) const

Definition of a comparison operator method pointer.

This `typedef` defines a comparison operator method pointer.

See also

operator==,
operator!=,
operator>,
operator<,
operator>=,
operator<=,
ComparisonOperatorEnum.

5.278.3 Member Enumeration Documentation

5.278.3.1 enum Arc::Software::ComparisonOperatorEnum

Comparison operator enum.

The ComparisonOperatorEnum enumeration is a 1-1 correspondance between the defined comparison method operators (Software::ComparisonOperator), and can be used in circumstances where method pointers are not supported.

Enumerator:

NOTEQUAL	see operator!=
EQUAL	see operator==
GREATERTHAN	see operator>
LESSTHAN	see operator<
GREATERTHANOREQUAL	see operator>=
LESSTHANOREQUAL	see operator<=

5.278.4 Constructor & Destructor Documentation

5.278.4.1 Arc::Software::Software ( ) [inline]

Dummy constructor.

This constructor creates a empty object.

5.278.4.2 Arc::Software::Software (const std::string & *name_version*)

Create a Software object.

Create a Software object from a single string composed of a name and a version part. The created object will contain a empty family part. The name and version part of the string will be split at the first occurence of a dash (-) which is followed by a digit (0-9). If the string does not contain such a pattern, the passed string will be taken to be the name and version will be empty.

Parameters

name_-version	should be a string composed of the name and version of the software to represent.

5.278.4.3 Arc::Software::Software (const std::string & *name*, const std::string & *version*)

Create a Software object.

Create a Software object with the specified name and version. The family part will be left empty.

Parameters

name	the software name to represent.
version	the software version to represent.

5.278.4.4 Arc::Software::Software (const std::string & *family*, const std::string & *name*, const std::string & *version*)

Create a Software object.

Create a Software object with the specified family, name and version.

Parameters

family	the software family to represent.
name	the software name to represent.
version	the software version to represent.

5.278.5 Member Function Documentation

5.278.5.1 static **ComparisonOperator** Arc::Software::convert (const **ComparisonOperatorEnum** & *co*) `[static]`

Convert a ComparisonOperatorEnum value to a comparison method pointer.

The passed ComparisonOperatorEnum will be converted to a comparison method pointer defined by the Software::ComparisonOperator typedef.

This static method is not defined in language bindings created with Swig, since method pointers are not supported by Swig.

Parameters

co	a ComparisonOperatorEnum value.

Returns

A method pointer to a comparison method is returned.

5.278.5.2 bool Arc::Software::empty ( ) const `[inline]`

Indicates whether the object is empty.

Returns

`true` if the name of this object is empty, otherwise `false`.

5.278.5.3 const std::string& Arc::Software::getFamily ( ) const `[inline]`

Get family.

Returns

The family the represented software belongs to is returned.

5.278.5.4 const std::string& Arc::Software::getName ( ) const `[inline]`

Get name.

Returns

The name of the represented software is returned.

5.278.5.5 const std::string& Arc::Software::getVersion ( ) const `[inline]`

Get version.

Returns

The version of the represented software is returned.

5.278.5.6 Arc::Software::operator std::string (void) const `[inline]`

Cast to string.

This casting operator behaves exactly as operator()() does. The cast is used like (std-::string) <software-object>.

See also

operator()().

References operator()().

5.278.5.7 bool Arc::Software::operator!= (const Software & *sw*) const `[inline]`

Inequality operator.

The behaviour of the inequality operator is just opposite that of the equality operator (operator==()).

Parameters

sw	is the RHS Software object.

Returns

`true` when the two objects are inequal, otherwise `false`.

References operator==().

5.278.5.8 std::string Arc::Software::operator() ( ) const

Get string representation.

Returns the string representation of this object, which is 'family'-'name'-'version'.

Returns

The string representation of this object is returned.

See also

operator std::string().

Referenced by operator std::string().

5.278.5.9 bool Arc::Software::operator< (const Software & *sw*) const [inline]

Less-than operator.

The behaviour of this less-than operator is equivalent to the greater-than operator (operator>()) with the LHS and RHS swapped.

Parameters

sw	is the RHS object.

Returns

`true` if the LHS is less than the RHS, otherwise `false`.

See also

operator>().

5.278.5.10 bool Arc::Software::operator<= (const Software & *sw*) const [inline]

Less-than or equal operator.

The LHS object is greater than or equal to the RHS object if the LHS equal the RHS (operator==()) or if the LHS is greater than the RHS (operator>()).

Parameters

sw	is the RHS object.

Returns

`true` if the LHS is less than or equal the RHS, otherwise `false`.

See also

operator==(),
operator<().

5.278.5.11 bool Arc::Software::operator== (const Software & *sw*) const [inline]

Equality operator.

Two Software objects are equal only if they are of the same family, have the same name and is of same version. This operator can also be represented by the Software::EQUAL ComparisonOperatorEnum value.

Parameters

sw	is the RHS Software object.

Returns

`true` when the two objects equals, otherwise `false`.

Referenced by operator!=().

5.278.5.12 bool Arc::Software::operator> (const Software & *sw*) const

Greater-than operator.

For the LHS object to be greater than the RHS object they must first share the same family and name. If the version of the LHS is empty or the LHS and RHS versions equal then LHS is not greater than RHS. If the LHS version is not empty while the RHS is then LHS is greater than RHS. If both versions are non empty and not equal then, the first version token of each object is compared and if they are identical, the two next version tokens will be compared. If not identical, the two tokens will be parsed as integers, and if parsing fails the LHS is not greater than the RHS. If parsing succeeds and the integers equals, the two next tokens will be compared, otherwise the comparison is resolved by the integer comparison.

If the LHS contains more version tokens than the RHS, and the comparison have not been resolved at the point of equal number of tokens, then if the additional tokens contains a token which cannot be parsed to a integer the LHS is not greater than the RHS. If the parsed integer is not 0 then the LHS is greater than the RHS. If the rest of the additional tokens are 0, the LHS is not greater than the RHS.

If the RHS contains more version tokens than the LHS and comparison have not been resolved at the point of equal number of tokens, or simply if comparison have not been resolved at the point of equal number of tokens, then the LHS is not greater than the RHS.

Parameters

sw	is the RHS object.

Returns

`true` if the LHS is greater than the RHS, otherwise `false`.

5.278.5.13 bool Arc::Software::operator>= (const Software & *sw*) const [inline]

Greater-than or equal operator.

The LHS object is greater than or equal to the RHS object if the LHS equal the RHS (operator==()) or if the LHS is greater than the RHS (operator>()).

Parameters

sw	is the RHS object.

Returns

`true` if the LHS is greated than or equal the RHS, otherwise `false`.

See also

operator==(),
operator>().

5.278.5.14 static std::string Arc::Software::toString (ComparisonOperator *co*) [static]

Convert Software::ComparisonOperator to a string.

This method is not available in language bindings created by Swig, since method pointers are not supported by Swig.

Parameters

co	is a Software::ComparisonOperator.

Returns

The string representation of the passed Software::ComparisonOperator is returned.

5.278.6 Friends And Related Function Documentation

5.278.6.1 std::ostream& operator<< (std::ostream & *out*, const Software & *sw*) [friend]

Write Software string representation to a std::ostream.

Write the string representation of a Software object to a std::ostream.

Parameters

out	is a std::ostream to write the string representation of the Software object to.
sw	is the Software object to write to the std::ostream.

Returns

The passed std::ostream *out* is returned.

5.278.7 Field Documentation

5.278.7.1 const std::string Arc::Software::VERSIONTOKENS [static]

Tokens used to split version string.

This string constant specifies which tokens will be used to split the version string.

The documentation for this class was generated from the following file:

- Software.h

5.279 Arc::SoftwareRequirement Class Reference

```
#include <Software.h>
```

Public Member Functions

- SoftwareRequirement ()
- SoftwareRequirement (const Software &sw, Software::ComparisonOperator swComOp=&Software::operator==)
- SoftwareRequirement (const Software &sw, Software::ComparisonOperatorEnum co)
- SoftwareRequirement & operator= (const SoftwareRequirement &sr)
- SoftwareRequirement (const SoftwareRequirement &sr)
- void add (const Software &sw, Software::ComparisonOperator swComOp=&Software::operator==)
- void add (const Software &sw, Software::ComparisonOperatorEnum co)
- bool isSatisfied (const Software &sw) const
- bool isSatisfied (const std::list< Software > &swList) const

- bool isSatisfied (const std::list< ApplicationEnvironment > &swList) const
- bool selectSoftware (const Software &sw)
- bool selectSoftware (const std::list< Software > &swList)
- bool selectSoftware (const std::list< ApplicationEnvironment > &swList)
- bool isResolved () const
- bool empty () const
- void clear ()
- const std::list< Software > & getSoftwareList () const
- const std::list < Software::ComparisonOperator > & getComparisonOperatorList () const

5.279.1 Detailed Description

Class used to express and resolve version requirements on software.

A requirement in this class is defined as a pair composed of a Software object and either a Software::ComparisonOperator method pointer or equally a Software::ComparisonOperatorEnum enum value. A SoftwareRequirement object can contain multiple of such requirements, and then it can specified if all these requirements should be satisfied, or if it is enough to satisfy only one of them. The requirements can be satisfied by a single Software object or a list of either Software or ApplicationEnvironment objects, by using the method isSatisfied(). This class also contain a number of methods (selectSoftware()) to select Software objects which are satisfying the requirements, and in this way resolving requirements.

5.279.2 Constructor & Destructor Documentation

5.279.2.1 Arc::SoftwareRequirement::SoftwareRequirement ( ) [inline]

Create a empty SoftwareRequirement object.

The created SoftwareRequirement object will contain no requirements.

5.279.2.2 Arc::SoftwareRequirement::SoftwareRequirement (const Software & *sw*, Software::ComparisonOperator *swComOp* = &Software::operator==)

Create a SoftwareRequirement object.

The created SoftwareRequirement object will contain one requirement specified by the Software object *sw*, and the Software::ComparisonOperator *swComOp*.

This constructor is not available in language bindings created by Swig, since method pointers are not supported by Swig, see SoftwareRequirement(const Software&, Software::ComparisonOperatorEnum) instead.

Parameters

sw	is the Software object of the requirement to add.
swComOp	is the Software::ComparisonOperator of the requirement to add.

5.279.2.3 Arc::SoftwareRequirement::SoftwareRequirement (const Software & *sw*, Software::ComparisonOperatorEnum *co*)

Create a SoftwareRequirement object.

The created SoftwareRequirement object will contain one requirement specified by the Software object *sw*, and the Software::ComparisonOperatorEnum *co*.

Parameters

sw	is the Software object of the requirement to add.
co	is the Software::ComparisonOperatorEnum of the requirement to add.

5.279.2.4 Arc::SoftwareRequirement::SoftwareRequirement (const SoftwareRequirement & *sr*) `[inline]`

Copy constructor.

Create a SoftwareRequirement object from another SoftwareRequirement object.

Parameters

sr	is the SoftwareRequirement object to make a copy of.

5.279.3 Member Function Documentation

5.279.3.1 void Arc::SoftwareRequirement::add (const Software & *sw*, Software::-ComparisonOperator *swComOp* = `&Software::operator==`)

Add a Software object a corresponding comparion operator to this object.

Adds software name and version to list of requirements and associates the comparison operator with it (equality by default).

This method is not available in language bindings created by Swig, since method pointers are not supported by Swig, see add(const Software&, Software::Comparison-OperatorEnum) instead.

Parameters

sw	is the Software object to add as part of a requirement.
swComOp	is the Software::ComparisonOperator method pointer to add as part of a requirement, the default operator will be Software::operator==().

5.279.3.2 void Arc::SoftwareRequirement::add (const Software & *sw*, Software::ComparisonOperatorEnum *co*)

Add a Software object a corresponding comparion operator to this object.

Adds software name and version to list of requirements and associates the comparison operator with it (equality by default).

Parameters

sw	is the Software object to add as part of a requirement.
co	is the Software::ComparisonOperatorEnum value to add as part of a requirement, the default enum will be Software::EQUAL.

5.279.3.3 void Arc::SoftwareRequirement::clear ( ) `[inline]`

Clear the object.

The requirements in this object will be cleared when invoking this method.

5.279.3.4 bool Arc::SoftwareRequirement::empty ( ) const `[inline]`

Test if the object is empty.

Returns

`true` if this object do no contain any requirements, otherwise `false`.

5.279.3.5 const std::list<Software::ComparisonOperator>& Arc::SoftwareRequirement::getComparisonOperatorList ( ) const `[inline]`

Get list of comparison operators.

Returns

The list of internally stored comparison operators is returned.

See also

Software::ComparisonOperator,
getSoftwareList.

5.279.3.6 const std::list<Software>& Arc::SoftwareRequirement::getSoftwareList ( ) const `[inline]`

Get list of Software objects.

Returns

The list of internally stored Software objects is returned.

See also

Software,
getComparisonOperatorList.

5.279.3.7 bool Arc::SoftwareRequirement::isResolved ( ) const

Indicates whether requirements have been resolved or not.

If specified that only one requirement has to be satisfied, then for this object to be resolved it can only contain one requirement and it has use the equal operator (Software::operator==).

If specified that all requirements has to be satisfied, then for this object to be resolved each requirement must have a Software object with a unique family/name composition, i.e. no other requirements have a Software object with the same family/name composition, and each requirement must use the equal operator (Software::operator==).

If this object has been resolved then `true` is returned when invoking this method, otherwise `false` is returned.

Returns

`true` if this object have been resolved, otherwise `false`.

5.279.3.8 bool Arc::SoftwareRequirement::isSatisfied (const Software & *sw*) const [inline]

Test if requirements are satisfied.

Returns `true` if the requirements are satisfied by the specified Software *sw*, otherwise `false` is returned.

Parameters

sw	is the Software which should satisfy the requirements.

Returns

`true` if requirements are satisfied, otherwise `false`.

See also

isSatisfied(const std::list<Software>&) const,
isSatisfied(const std::list<ApplicationEnvironment>&) const,
selectSoftware(const Software&),
isResolved() const.

References isSatisfied().

Referenced by isSatisfied().

5.279.3.9 bool Arc::SoftwareRequirement::isSatisfied (const std::list< **Software** > & *swList*) const [inline]

Test if requirements are satisfied.

Returns `true` if stored requirements are satisfied by software specified in *swList*, otherwise `false` is returned.

Note that if all requirements must be satisfied and multiple requirements exist having identical name and family all these requirements should be satisfied by a single Software object.

Parameters

swList	is the list of Software objects which should be used to try satisfy the requirements.

Returns

`true` if requirements are satisfied, otherwise `false`.

See also

isSatisfied(const Software&) const,
isSatisfied(const std::list<ApplicationEnvironment>&) const,
selectSoftware(const std::list<Software>&),
isResolved() const.

5.279.3.10 bool Arc::SoftwareRequirement::isSatisfied (const std::list< **ApplicationEnvironment** > & *swList*) const

Test if requirements are satisfied.

This method behaves in exactly the same way as the isSatisfied(const Software&) const method does.

Parameters

swList	is the list of ApplicationEnvironment objects which should be used to try satisfy the requirements.

Returns

`true` if requirements are satisfied, otherwise `false`.

See also

isSatisfied(const Software&) const,
isSatisfied(const std::list<Software>&) const,
selectSoftware(const std::list<ApplicationEnvironment>&),

isResolved() const.

5.279.3.11 SoftwareRequirement& Arc::SoftwareRequirement::operator= (const SoftwareRequirement & *sr*)

Assignment operator.

Set this object equal to that of the passed SoftwareRequirement object *sr*.

Parameters

sr	is the SoftwareRequirement object to set object equal to.

5.279.3.12 bool Arc::SoftwareRequirement::selectSoftware (const Software & *sw*) `[inline]`

Select software.

If the passed Software *sw* do not satisfy the requirements `false` is returned and this object is not modified. If however the Software object *sw* do satisfy the requirements `true` is returned and the requirements are set to equal the *sw* Software object.

Parameters

sw	is the Software object used to satisfy requirements.

Returns

`true` if requirements are satisfied, otherwise `false`.

See also

selectSoftware(const std::list<Software>&),
selectSoftware(const std::list<ApplicationEnvironment>&),
isSatisfied(const Software&) const,
isResolved() const.

References selectSoftware().

Referenced by selectSoftware().

5.279.3.13 bool Arc::SoftwareRequirement::selectSoftware (const std::list< Software > & *swList*)

Select software.

If the passed list of Software objects *swList* do not satisfy the requirements `false` is returned and this object is not modified. If however the list of Software objects *swList* do satisfy the requirements `true` is returned and the Software objects satisfying the requirements will replace these with the equality operator (Software::operator==) used as the comparator for the new requirements.

Note that if all requirements must be satisfied and multiple requirements exist having identical name and family all these requirements should be satisfied by a single Software object and it will replace all these requirements.

Parameters

swList	is a list of Software objects used to satisfy requirements.

Returns

`true` if requirements are satisfied, otherwise `false`.

See also

selectSoftware(const Software&),
selectSoftware(const std::list<ApplicationEnvironment>&),
isSatisfied(const std::list<Software>&) const,
isResolved() const.

5.279.3.14 bool Arc::SoftwareRequirement::selectSoftware (const std::list< ApplicationEnvironment > & *swList*)

Select software.

This method behaves exactly as the selectSoftware(const std::list<Software>&) method does.

Parameters

swList	is a list of ApplicationEnvironment objects used to satisfy requirements.

Returns

`true` if requirements are satisfied, otherwise `false`.

See also

selectSoftware(const Software&),
selectSoftware(const std::list<Software>&),
isSatisfied(const std::list<ApplicationEnvironment>&) const,
isResolved() const.

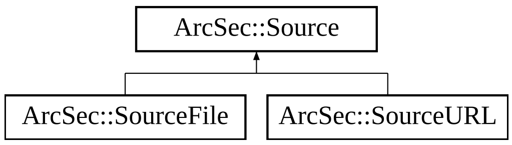
The documentation for this class was generated from the following file:

- Software.h

5.280 ArcSec::Source Class Reference

```
#include <Source.h>
```

Inheritance diagram for ArcSec::Source:



Public Member Functions

- Source (const Source &s)
- Source (Arc::XMLNode xml)
- Source (std::istream &stream)
- Source (Arc::URL &url)
- Source (const std::string &str)
- Arc::XMLNode Get (void) const
- operator bool (void)

5.280.1 Detailed Description

Acquires and parses XML document from specified source.

This class is to be used to provide easy way to specify different sources for XML - Authorization Policies and Requests.

5.280.2 Constructor & Destructor Documentation

5.280.2.1 ArcSec::Source::Source (const Source & *s*) [inline]

Copy constructor.

Use this constructor only for temporary objects. Parsed XML document is still owned by copied source and hence lifetime of created object should not exceed that of copied one.

5.280.2.2 ArcSec::Source::Source (Arc::XMLNode *xml*)

Use XML subtree refered by xml.

There is no copy of xml made. Hence lifetime of this object should not exceed that of xml.

5.280.2.3 ArcSec::Source::Source (Arc::URL & *url*)

Fetch XML document from specified url and parse it.

This constructor is not implemented yet.

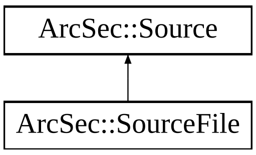
The documentation for this class was generated from the following file:

- Source.h

5.281 ArcSec::SourceFile Class Reference

`#include <Source.h>`

Inheritance diagram for ArcSec::SourceFile:



Public Member Functions

- SourceFile (const SourceFile &s)
- SourceFile (const char ∗name)
- SourceFile (const std::string &name)

5.281.1 Detailed Description

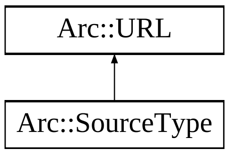
Convenience class for obtaining XML document from file.

The documentation for this class was generated from the following file:

- Source.h

5.282 Arc::SourceType Class Reference

Inheritance diagram for Arc::SourceType:



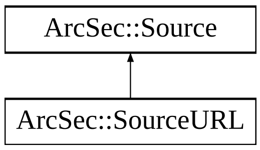
The documentation for this class was generated from the following file:

- JobDescription.h

5.283 ArcSec::SourceURL Class Reference

```
#include <Source.h>
```

Inheritance diagram for ArcSec::SourceURL:



Public Member Functions

- SourceURL (const SourceURL &s)
- SourceURL (const char ∗url)
- SourceURL (const std::string &url)

5.283.1 Detailed Description

Convenience class for obtaining XML document from remote URL.

The documentation for this class was generated from the following file:

- Source.h

5.284 DataStaging::DataDeliveryComm::Status Struct Reference

```
#include <DataDeliveryComm.h>
```

Data Fields

- CommStatusType commstatus
- time_t timestamp
- DTRStatus::DTRStatusType status
- DTRErrorStatus::DTRErrorStatusType error
- DTRErrorStatus::DTRErrorLocation error_location
- char error_desc [256]
- unsigned int streams

- unsigned long long int transferred
- unsigned long long int offset
- unsigned long long int size
- unsigned int speed
- char checksum [128]

5.284.1 Detailed Description

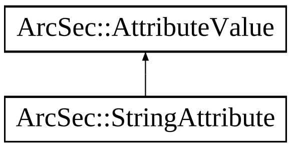
Plain C struct to pass information from executing process back to main thread.

The documentation for this struct was generated from the following file:

- DataDeliveryComm.h

5.285 ArcSec::StringAttribute Class Reference

Inheritance diagram for ArcSec::StringAttribute:



Public Member Functions

- virtual bool equal (AttributeValue ∗other, bool check_id=true)
- virtual std::string encode ()
- virtual std::string getType ()
- virtual std::string getId ()

5.285.1 Member Function Documentation

5.285.1.1 virtual std::string ArcSec::StringAttribute::encode ( ) `[inline, virtual]`

encode the value in a string format

Implements ArcSec::AttributeValue.

5.285.1.2 virtual bool ArcSec::StringAttribute::equal (AttributeValue ∗ *value*, bool *check_id* = `true`) `[virtual]`

Evluate whether "this" equale to the parameter value

Implements ArcSec::AttributeValue.

5.285.1.3 virtual std::string ArcSec::StringAttribute::getId ( ) `[inline, virtual]`

Get the AttributeId of the <Attribute>

Implements ArcSec::AttributeValue.

5.285.1.4 virtual std::string ArcSec::StringAttribute::getType ( ) `[inline, virtual]`

Get the DataType of the <Attribute>

Implements ArcSec::AttributeValue.

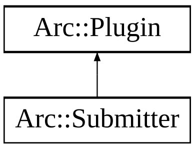
The documentation for this class was generated from the following file:

- StringAttribute.h

5.286 Arc::Submitter Class Reference

`#include <Submitter.h>`

Inheritance diagram for Arc::Submitter:



Public Member Functions

- bool GetTestJob (const int &testid, JobDescription &jobdescription)
- virtual bool Submit (const JobDescription &jobdesc, const ExecutionTarget &et, Job &job)=0
- virtual bool Migrate (const URL &jobid, const JobDescription &jobdesc, const - ExecutionTarget &et, bool forcemigration, Job &job)=0

Protected Attributes

- const ExecutionTarget ∗ target

5.286.1 Detailed Description

Base class for the Submitters.

Submitter is the base class for Grid middleware specialized Submitter objects. The class submits job(s) to the computing resource it represents and uploads (needed by the job) local input files.

5.286.2 Member Function Documentation

5.286.2.1 bool Arc::Submitter::GetTestJob (const int & *testid*, JobDescription & *jobdescription*)

This virtual method can be ovverriden by plugins which should be capable of getting test job descriptions for the specified flavour. This method should return with the Job-Description or NULL if ther is no test description defined with the requested id.

5.286.2.2 virtual bool Arc::Submitter::Migrate (const URL & *jobid*, const JobDescription & *jobdesc*, const ExecutionTarget & *et*, bool *forcemigration*, Job & *job*) [pure virtual]

Migrate job.

This virtual method should be overridden by plugins which should be capable of migrating jobs. The active job which should be migrated is pointed to by the URL jobid, and is represented by the JobDescription jobdesc. The forcemigration boolean specifies if the migration should succeed if the active job cannot be terminated. The protected method AddJob can be used to save job information. This method should return the URL of the migrated job. In case migration fails an empty URL should be returned.

5.286.2.3 virtual bool Arc::Submitter::Submit (const JobDescription & *jobdesc*, const ExecutionTarget & *et*, Job & *job*) [pure virtual]

Submit job.

This virtual method should be overridden by plugins which should be capable of submitting jobs, defined in the JobDescription jobdesc, to the ExecutionTarget et. The protected convenience method AddJob can be used to save job information. This method should return the URL of the submitted job. In case submission fails an empty URL should be returned.

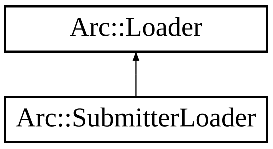
The documentation for this class was generated from the following file:

- Submitter.h

5.287 Arc::SubmitterLoader Class Reference

`#include <Submitter.h>`

Inheritance diagram for Arc::SubmitterLoader:



Public Member Functions

- SubmitterLoader ()
- ∼SubmitterLoader ()
- Submitter ∗ load (const std::string &name, const UserConfig &usercfg)
- const std::list< Submitter ∗ > & GetSubmitters () const

5.287.1 Detailed Description

Class responsible for loading Submitter plugins The Submitter objects returned by a SubmitterLoader must not be used after the SubmitterLoader goes out of scope.

5.287.2 Constructor & Destructor Documentation

5.287.2.1 Arc::SubmitterLoader::SubmitterLoader ( )

Constructor Creates a new SubmitterLoader.

5.287.2.2 Arc::SubmitterLoader::∼SubmitterLoader ( )

Destructor Calling the destructor destroys all Submitters loaded by the SubmitterLoader instance.

5.287.3 Member Function Documentation

5.287.3.1 const std::list<Submitter∗>& Arc::SubmitterLoader::GetSubmitters ( ) const [inline]

Retrieve the list of loaded Submitters.

Returns

A reference to the list of Submitters.

5.287.3.2 Submitter∗ Arc::SubmitterLoader::load (const std::string & *name*, const UserConfig & *usercfg*)

Load a new Submitter

Parameters

name	The name of the Submitter to load.
usercfg	The UserConfig object for the new Submitter.

Returns

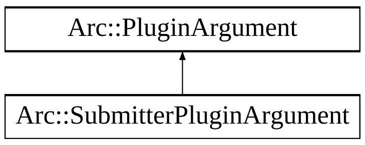
A pointer to the new Submitter (NULL on error).

The documentation for this class was generated from the following file:

- Submitter.h

5.288 Arc::SubmitterPluginArgument Class Reference

Inheritance diagram for Arc::SubmitterPluginArgument:



The documentation for this class was generated from the following file:

- Submitter.h

5.289 Arc::SubmitterTestACCControl Class Reference

The documentation for this class was generated from the following file:

- TestACCControl.h

5.290 Arc::TargetGenerator Class Reference

```
#include <TargetGenerator.h>
```

Public Member Functions

- TargetGenerator (const UserConfig &usercfg, unsigned int startRetrieval=0)
- void RetrieveExecutionTargets ()
- void RetrieveJobs ()
- const std::list < ExecutionTarget > & GetExecutionTargets () const
- const std::list< Job > & GetJobs () const
- bool AddService (const std::string &Flavour, const URL &url)
- bool AddIndexServer (const std::string &Flavour, const URL &url)
- void AddTarget (const ExecutionTarget &target)

- void AddJob (const Job &job)
- void SaveTargetInfoToStream (std::ostream &out, bool longlist) const
- SimpleCounter & ServiceCounter (void)

5.290.1 Detailed Description

Target generation class

The TargetGenerator class is the umbrella class for resource discovery and information retrieval (index servers and execution services). It can also be used to discover user Grid jobs and detailed information. The TargetGenerator loads TargetRetriever plugins (which implements the actual information retrieval) from URL objects found in the UserConfig object passed to its constructor using the custom TargetRetrieverLoader.

5.290.2 Constructor & Destructor Documentation

5.290.2.1 Arc::TargetGenerator::TargetGenerator (const UserConfig & *usercfg*, unsigned int *startRetrieval* = 0)

Create a TargetGenerator object.

Default constructor to create a TargeGenerator. The constructor reads the computing and index service URL objects from the passed UserConfig object using the UserConfig:GetSelectedServices method. From each URL a matching specialized TargetRetriever plugin is loaded using the TargetRetrieverLoader. If the second parameter, startRetrieval, is specified, and matches bitwise either a value of 1, 2 or both, retrieval of execution services, jobs or both will be initiated.

Parameters

usercfg	is a reference to a UserConfig object from which endpoints to execution and/or index services will be used. The object also hold information about user credentials.
startRetrival	specifies whether retrival should be started directly. It will be parsed bitwise. A value of 1 will start execution service retrieval (RetrieveExecutionTargets), 2 jobs (RetrieveJobs), and 3 both, while 0 will not start retrieval at all. If not specified, default is 0.

5.290.3 Member Function Documentation

5.290.3.1 bool Arc::TargetGenerator::AddIndexServer (const std::string & *Flavour*, const URL & *url*)

Add a new index server to the foundIndexServers list.

Method to add a new index server to the list of foundIndexServers in a thread secure way. Compares the argument URL against the servers returned by UserConfig::GetRejectedServices and only allows to add the service if not specifically rejected.

Parameters

flavour	The flavour if the the index server.
url	URL pointing to the index server.

5.290.3.2 void Arc::TargetGenerator::AddJob (const Job & *job*)

Add a new Job to this object.

Method to add a new Job (usually discovered by a TargetRetriever) to the internal list of jobs in a thread secure way.

Parameters

job	Job describing the job.

See also

AddJob(const Job&)

5.290.3.3 bool Arc::TargetGenerator::AddService (const std::string & *Flavour,* const URL & *url*)

Add a new computing service to the foundServices list.

Method to add a new service to the list of foundServices in a thread secure way. Compares the argument URL against the services returned by UserConfig::GetRejectedServices and only allows to add the service if not specifically rejected.

Parameters

flavour	The flavour if the the computing service.
url	URL pointing to the information system of the computing service.

5.290.3.4 void Arc::TargetGenerator::AddTarget (const ExecutionTarget & *target*)

Add a new ExecutionTarget to the foundTargets list.

Method to add a new ExecutionTarget (usually discovered by a TargetRetriever) to the list of foundTargets in a thread secure way.

Parameters

target	ExecutionTarget to be added.

5.290.3.5 const std::list<ExecutionTarget>& Arc::TargetGenerator::GetExecutionTargets ( ) const [inline]

Return targets fetched by RetrieveExecutionTargets method.

Method to return a const list of ExecutionTarget objects retrieved by the Retrieve-ExecutionTargets method.

See also

RetrieveExecutionTargets
GetExecutionTargets

5.290.3.6 const std::list<Job>& Arc::TargetGenerator::GetJobs ( ) const [inline]

Return jobs retrieved by RetrieveJobs method.

Method to return the list of jobs found by a call to the GetJobs method.

Returns

A list of the discovered jobs as Job objects is returned

See also

RetrieveJobs

5.290.3.7 void Arc::TargetGenerator::RetrieveExecutionTargets ( )

Retrieve available execution services.

The endpoints specified in the UserConfig object passed to this object will be used to retrieve information about execution services (ExecutionTarget objects). The discovery and information retrieval of targets is carried out in parallel threads to speed up the process. If a endpoint is a index service each execution service registered will be queried.

See also

RetrieveJobs
GetExecutionTargets

5.290.3.8 void Arc::TargetGenerator::RetrieveJobs ( )

Retrieve job information from execution services.

The endpoints specified in the UserConfig object passed to this object will be used to retrieve job information from these endpoints. Only jobs owned by the user which is identified by the credentials specified in the passed UserConfig object will be considered (exception being services which has no user authentification). If a endpoint is a index service, each execution service registered will be queried, and searched for job information.

See also

RetrieveExecutionTargets

5.290.3.9 void Arc::TargetGenerator::SaveTargetInfoToStream (std::ostream & *out*, bool *longlist*) const

Prints target information.

Method to print information of the found targets to std::cout.

Parameters

out	is a std::ostream object which to direct target informetion to.
longlist	false for minimal information, true for detailed information

5.290.3.10 SimpleCounter& Arc::TargetGenerator::ServiceCounter (void)

Returns reference to worker counter.

This method returns reference to counter which keeps amount of started worker threads communicating with services asynchronously. The counter must be incremented for every thread started and decremented when thread exits. Main thread will then wait till counters drops to zero.

The documentation for this class was generated from the following file:

- TargetGenerator.h

5.291 Arc::TargetInformationRetrieverPluginTESTControl Class - Reference

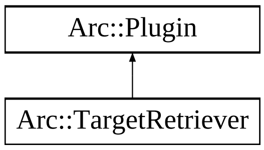
The documentation for this class was generated from the following file:

- TestACCControl.h

5.292 Arc::TargetRetriever Class Reference

```
#include <TargetRetriever.h>
```

Inheritance diagram for Arc::TargetRetriever:



Public Member Functions

- virtual void GetExecutionTargets (TargetGenerator &mom)=0
- virtual void GetJobs (TargetGenerator &mom)=0

Protected Member Functions

- TargetRetriever (const UserConfig &usercfg, const URL &url, ServiceType st, const std::string &flavour)

5.292.1 Detailed Description

TargetRetriever base class

The TargetRetriever class is a pure virtual base class to be used for grid flavour specializations. It is designed to work in conjunction with the TargetGenerator.

5.292.2 Constructor & Destructor Documentation

5.292.2.1 Arc::TargetRetriever::TargetRetriever (const **UserConfig** & *usercfg*, const **URL** & *url*, ServiceType *st*, const std::string & *flavour*) [protected]

TargetRetriever constructor.

Default constructor to create a TargeGenerator. The constructor reads the computing and index service URL objects from the

Parameters

usercfg	
url	
st	
flavour	

5.292.3 Member Function Documentation

5.292.3.1 virtual void Arc::TargetRetriever::GetExecutionTargets (TargetGenerator & *mom*) [pure virtual]

Method for collecting targets.

Pure virtual method for collecting targets. Implementation depends on the Grid middleware in question and is thus left to the specialized class.

Parameters

mom	is the reference to the TargetGenerator which has loaded the TargetRetriever
detailLevel	is the required level of details (1 = All details, 2 = Limited details)

5.292.3.2 virtual void Arc::TargetRetriever::GetJobs (TargetGenerator & *mom*) [pure virtual]

Method for collecting targets.

Pure virtual method for collecting targets. Implementation depends on the Grid middleware in question and is thus left to the specialized class.

Parameters

mom	is the reference to the TargetGenerator which has loaded the TargetRetriever
detailLevel	is the required level of details (1 = All details, 2 = Limited details)

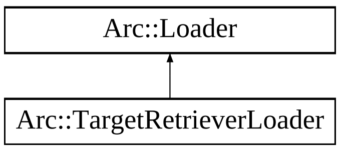
The documentation for this class was generated from the following file:

- TargetRetriever.h

5.293 Arc::TargetRetrieverLoader Class Reference

```
#include <TargetRetriever.h>
```

Inheritance diagram for Arc::TargetRetrieverLoader:



Public Member Functions

- TargetRetrieverLoader ()

- ∼TargetRetrieverLoader ()
- TargetRetriever ∗ load (const std::string &name, const UserConfig &usercfg, const std::string &service, const ServiceType &st)
- const std::list < TargetRetriever ∗ > & GetTargetRetrievers () const

5.293.1 Detailed Description

Class responsible for loading TargetRetriever plugins The TargetRetriever objects returned by a TargetRetrieverLoader must not be used after the TargetRetrieverLoader goes out of scope.

5.293.2 Constructor & Destructor Documentation

5.293.2.1 Arc::TargetRetrieverLoader::TargetRetrieverLoader ( )

Constructor Creates a new TargetRetrieverLoader.

5.293.2.2 Arc::TargetRetrieverLoader::∼TargetRetrieverLoader ( )

Destructor Calling the destructor destroys all TargetRetrievers loaded by the TargetRetrieverLoader instance.

5.293.3 Member Function Documentation

5.293.3.1 const std::list<TargetRetriever∗>& Arc::TargetRetrieverLoader::GetTargetRetrievers ( ) const [inline]

Retrieve the list of loaded TargetRetrievers.

Returns

A reference to the list of TargetRetrievers.

5.293.3.2 TargetRetriever∗ Arc::TargetRetrieverLoader::load (const std::string & *name*, const UserConfig & *usercfg*, const std::string & *service*, const ServiceType & *st*)

Load a new TargetRetriever

Parameters

name	The name of the TargetRetriever to load.
usercfg	The UserConfig object for the new TargetRetriever.
service	The URL used to contact the target.
st	specifies service type of the target.

Returns

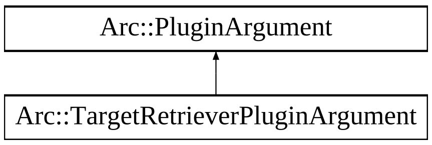
A pointer to the new TargetRetriever (NULL on error).

The documentation for this class was generated from the following file:

- TargetRetriever.h

5.294 Arc::TargetRetrieverPluginArgument Class Reference

Inheritance diagram for Arc::TargetRetrieverPluginArgument:



The documentation for this class was generated from the following file:

- TargetRetriever.h

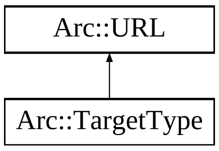
5.295 Arc::TargetRetrieverTestACCControl Class Reference

The documentation for this class was generated from the following file:

- TestACCControl.h

5.296 Arc::TargetType Class Reference

Inheritance diagram for Arc::TargetType:



The documentation for this class was generated from the following file:

- JobDescription.h

5.297 Arc::EndpointRetriever::ThreadArg Class Reference

The documentation for this class was generated from the following file:

- EndpointRetriever.h

5.298 DataStaging::Processor::ThreadArgument Class Reference

5.298.1 Detailed Description

Class used to pass information to spawned thread.

The documentation for this class was generated from the following file:

- Processor.h

5.299 Arc::ThreadDataItem Class Reference

```
#include <Thread.h>
```

Public Member Functions

- ThreadDataItem (void)
- ThreadDataItem (std::string &key)
- ThreadDataItem (const std::string &key)
- void Attach (std::string &key)
- void Attach (const std::string &key)
- virtual void Dup (void)

Static Public Member Functions

- static ThreadDataItem ∗ Get (const std::string &key)

5.299.1 Detailed Description

Base class for per-thread object.

Classes inherited from this one are attached to current thread under specified key and destroyed only when thread ends or object is replaced by another one with same key.

5.299.2 Constructor & Destructor Documentation

5.299.2.1 Arc::ThreadDataItem::ThreadDataItem (void)

Dummy constructor which does nothing. To make object usable one of Attach(...) methods must be used.

5.299.2.2 Arc::ThreadDataItem::ThreadDataItem (std::string & *key*)

Creates instance and attaches it to current thread under key. If supplied key is empty random one is generated and stored in key variable.

5.299.2.3 Arc::ThreadDataItem::ThreadDataItem (const std::string & *key*)

Creates instance and attaches it to current thread under key.

5.299.3 Member Function Documentation

5.299.3.1 void Arc::ThreadDataItem::Attach (std::string & *key*)

Attaches object to current thread under key. If supplied key is empty random one is generated and stored in key variable. This method must be used only if object was created using dummy constructor.

5.299.3.2 void Arc::ThreadDataItem::Attach (const std::string & *key*)

Attaches object to current thread under key. This method must be used only if object was created using dummy constructor.

5.299.3.3 virtual void Arc::ThreadDataItem::Dup (void) `[virtual]`

Creates copy of object. This method is called when new thread is created from current thread. It is called in new thread, so new object - if created - gets attached to new thread. If object is not meant to be inherited by new threads then this method should do nothing.

5.299.3.4 static ThreadDataItem* Arc::ThreadDataItem::Get (const std::string & *key*) `[static]`

Retrieves object attached to thread under key. Returns NULL if no such obejct.

The documentation for this class was generated from the following file:

- Thread.h

5.300 Arc::ThreadedPointer Class Reference

```
#include <Thread.h>
```

Public Member Functions

- T & operator∗ (void) const
- T ∗ operator-> (void) const
- operator bool (void) const
- bool operator! (void) const
- bool operator== (const ThreadedPointer &p) const
- bool operator!= (const ThreadedPointer &p) const
- bool operator< (const ThreadedPointer &p) const
- T ∗ Ptr (void) const
- T ∗ Release (void)
- unsigned int Holders (void)
- unsigned int WaitOutRange (unsigned int minThr, unsigned int maxThr)
- unsigned int WaitOutRange (unsigned int minThr, unsigned int maxThr, int timeout)
- unsigned int WaitInRange (unsigned int minThr, unsigned int maxThr)
- unsigned int WaitInRange (unsigned int minThr, unsigned int maxThr, int timeout)

5.300.1 Detailed Description

Wrapper for pointer with automatic destruction and mutiple references.

See for CountedPointer for description. Differently from CountedPointer this class provides thread safe destruction of refered object. But the instance of ThreadedPointer itself is not thread safe. Hence it is advisable to use different instances in different threads.

5.300.2 Member Function Documentation

5.300.2.1 T∗ Arc::ThreadedPointer::Release (void) `[inline]`

Release refered object so that it can be passed to other container.

After Release() is called refered object is will not be destroyed automatically anymore.

5.300.2.2 unsigned int Arc::ThreadedPointer::WaitInRange (unsigned int *minThr,* unsigned int *maxThr,* int *timeout*) `[inline]`

Waits till number of ThreadedPointer instances >= minThr and <= maxThr.

Waits no longer than timeout milliseconds. If timeout is negative - wait forever. Returns current number of instances.

5.300.2.3 unsigned int Arc::ThreadedPointer::WaitOutRange (unsigned int *minThr,* unsigned int *maxThr,* int *timeout*) [inline]

Waits till number of ThreadedPointer instances <= minThr or >= maxThr.

Waits no longer than timeout milliseconds. If timeout is negative - wait forever. Returns current number of instances.

The documentation for this class was generated from the following file:

- Thread.h

5.301 Arc::ThreadedPointerBase Class Reference

```
#include <Thread.h>
```

5.301.1 Detailed Description

Helper class for ThreadedPointer.

The documentation for this class was generated from the following file:

- Thread.h

5.302 Arc::ThreadInitializer Class Reference

The documentation for this class was generated from the following file:

- Thread.h

5.303 Arc::ThreadRegistry Class Reference

```
#include <Thread.h>
```

Public Member Functions

- void RegisterThread (void)
- void UnregisterThread (void)
- bool WaitOrCancel (int timeout)
- bool WaitForExit (int timeout=-1)

5.303.1 Detailed Description

This class is a set of conditions, mutexes, etc. conveniently exposed to monitor running child threads and to wait till they exit. There are no protections against race conditions. So use it carefully.

5.303.2 Member Function Documentation

5.303.2.1 bool Arc::ThreadRegistry::WaitForExit (int *timeout* = `-1`)

Wait for registered threads to exit. Leave after timeout miliseconds if failed. Returns true if all registered threads reported their exit.

5.303.2.2 bool Arc::ThreadRegistry::WaitOrCancel (int *timeout*)

Wait for timeout milliseconds or cancel request. Returns true if cancel request received.

The documentation for this class was generated from the following file:

- Thread.h

5.304 Arc::Time Class Reference

`#include <DateTime.h>`

Public Member Functions

- Time ()
- Time (time_t)
- Time (time_t time, uint32_t nanosec)
- Time (const std::string &)
- Time & operator= (time_t)
- Time & operator= (const Time &)
- Time & operator= (const char *)
- Time & operator= (const std::string &)
- void SetTime (time_t)
- void SetTime (time_t time, uint32_t nanosec)
- time_t GetTime () const
- operator std::string () const
- std::string str (const TimeFormat &=time_format) const
- bool operator< (const Time &) const
- bool operator> (const Time &) const
- bool operator<= (const Time &) const
- bool operator>= (const Time &) const

- bool operator== (const Time &) const
- bool operator!= (const Time &) const
- Time operator+ (const Period &) const
- Time operator- (const Period &) const
- Period operator- (const Time &) const

Static Public Member Functions

- static void SetFormat (const TimeFormat &)
- static TimeFormat GetFormat ()

5.304.1 Detailed Description

A class for storing and manipulating times.

5.304.2 Constructor & Destructor Documentation

5.304.2.1 Arc::Time::Time ( )

Default constructor. The time is put equal the current time.

5.304.2.2 Arc::Time::Time (time_t)

Constructor that takes a time_t variable and stores it.

5.304.2.3 Arc::Time::Time (time_t *time*, uint32_t *nanosec*)

Constructor that takes a fine grained time variables and stores them.

5.304.2.4 Arc::Time::Time (const std::string &)

Constructor that tries to convert a string into a time_t.

5.304.3 Member Function Documentation

5.304.3.1 static TimeFormat Arc::Time::GetFormat ( ) [static]

Gets the default format for time strings.

5.304.3.2 time_t Arc::Time::GetTime ( ) const

gets the time

5.304.3.3 Arc::Time::operator std::string ( ) const

Returns a string representation of the time, using the default format.

5.304.3.4 bool Arc::Time::operator!= (const Time &) const

Comparing two Time objects.

5.304.3.5 Time Arc::Time::operator+ (const Period &) const

Adding Time object with Period object.

5.304.3.6 Time Arc::Time::operator- (const Period &) const

Subtracting Period object from Time object.

5.304.3.7 Period Arc::Time::operator- (const Time &) const

Subtracting Time object from the other Time object.

5.304.3.8 bool Arc::Time::operator< (const Time &) const

Comparing two Time objects.

5.304.3.9 bool Arc::Time::operator<= (const Time &) const

Comparing two Time objects.

5.304.3.10 Time& Arc::Time::operator= (time_t)

Assignment operator from a time_t.

5.304.3.11 Time& Arc::Time::operator= (const Time &)

Assignment operator from a Time.

5.304.3.12 Time& Arc::Time::operator= (const char *)

Assignment operator from a char pointer.

5.304.3.13 Time& Arc::Time::operator= (const std::string &)

Assignment operator from a string.

5.304.3.14 bool Arc::Time::operator== (const Time &) const

Comparing two Time objects.

5.304.3.15 bool Arc::Time::operator> (const Time &) const

Comparing two Time objects.

5.304.3.16 bool Arc::Time::operator>= (const Time &) const

Comparing two Time objects.

5.304.3.17 static void Arc::Time::SetFormat (const TimeFormat &) [static]

Sets the default format for time strings.

5.304.3.18 void Arc::Time::SetTime (time_t)

sets the time

Referenced by DataStaging::DTR::set_timeout().

5.304.3.19 void Arc::Time::SetTime (time_t *time,* uint32_t *nanosec*)

sets the fine grained time

5.304.3.20 std::string Arc::Time::str (const TimeFormat & = time_format) const

Returns a string representation of the time, using the specified format.

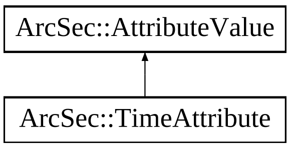
The documentation for this class was generated from the following file:

- DateTime.h

5.305 ArcSec::TimeAttribute Class Reference

`#include <DateTimeAttribute.h>`

Inheritance diagram for ArcSec::TimeAttribute:



Public Member Functions

- virtual bool equal (AttributeValue ∗other, bool check_id=true)
- virtual std::string encode ()
- virtual std::string getType ()
- virtual std::string getId ()

5.305.1 Detailed Description

Format: HHMMSSZ HH:MM:SS HH:MM:SS+HH:MM HH:MM:SSZ

5.305.2 Member Function Documentation

5.305.2.1 virtual std::string ArcSec::TimeAttribute::encode ( ) `[virtual]`

encode the value in a string format

Implements ArcSec::AttributeValue.

5.305.2.2 virtual bool ArcSec::TimeAttribute::equal (AttributeValue ∗ *value*, bool *check_id* = `true`) `[virtual]`

Evluate whether "this" equale to the parameter value

Implements ArcSec::AttributeValue.

5.305.2.3 virtual std::string ArcSec::TimeAttribute::getId ( ) `[inline, virtual]`

Get the AttributeId of the <Attribute>

Implements ArcSec::AttributeValue.

5.305.2.4 virtual std::string ArcSec::TimeAttribute::getType ( ) `[inline, virtual]`

Get the DataType of the <Attribute>

Implements ArcSec::AttributeValue.

The documentation for this class was generated from the following file:

- DateTimeAttribute.h

5.306 Arc::TimedMutex Class Reference

The documentation for this class was generated from the following file:

- Thread.h

5.307 DataStaging::TransferParameters Class Reference

```
#include <DTR.h>
```

Public Member Functions

- TransferParameters ()

Data Fields

- unsigned long long int min_average_bandwidth
- unsigned int max_inactivity_time
- unsigned long long int min_current_bandwidth
- unsigned int averaging_time

5.307.1 Detailed Description

Represents limits and properties of a DTR transfer. These generally apply to all DTRs.

5.307.2 Field Documentation

5.307.2.1 unsigned int **DataStaging::TransferParameters::max_inactivity_time**

Maximum inactivity time in sec - if transfer stops for longer than this time it should be killed

5.307.2.2 unsigned long long int **DataStaging::TransferParameters::min_average_-bandwidth**

Minimum average bandwidth in bytes/sec - if the average bandwidth used drops below this level the transfer should be killed

5.307.2.3 unsigned long long int DataStaging::TransferParameters::min_current_-bandwidth

Minimum current bandwidth - if bandwidth averaged over averaging_time is less than minimum the transfer should be killed (allows transfers which slow down to be killed quicker)

The documentation for this class was generated from the following file:

- DTR.h

5.308 DataStaging::TransferShares Class Reference

```
#include <TransferShares.h>
```

Public Member Functions

- TransferShares ()
- TransferShares (const TransferSharesConf &shares_conf)
- ∼TransferShares ()
- TransferShares (const TransferShares &shares)
- TransferShares & operator= (const TransferShares &shares)
- void set_shares_conf (const TransferSharesConf &share_conf)
- void calculate_shares (int TotalNumberOfSlots)
- void increase_transfer_share (const std::string &ShareToIncrease)
- void decrease_transfer_share (const std::string &ShareToDecrease)
- void decrease_number_of_slots (const std::string &ShareToDecrease)
- bool can_start (const std::string &ShareToStart)
- std::map< std::string, int > active_shares () const

5.308.1 Detailed Description

TransferShares is used to implement fair-sharing and priorities.

TransferShares defines the algorithm used to prioritise and share transfers among different users or groups. Configuration information on the share type and reference shares is held in a TransferSharesConf instance. The Scheduler uses TransferShares to determine which DTRs in the queue for each process go first. The calculation is based on the configuration and the currently active shares (the DTRs already in the process). can-_start() is the method called by the Scheduler to determine whether a particular share has an available slot in the process.

5.308.2 Member Function Documentation

5.308.2.1 void DataStaging::TransferShares::calculate_shares (int *TotalNumberOfSlots*)

Calculate how many slots to assign to each active share.

This method is called each time the Scheduler loops to calculate the number of slots to assign to each share, based on the current number of active shares and the shares' relative priorities.

5.308.2.2 void DataStaging::TransferShares::decrease_number_of_slots (const std::string & *ShareToDecrease*)

Decrease by one the number of slots available to the given share.

Called when there is a slot already used by this share to reduce the number available.

5.308.2.3 void DataStaging::TransferShares::decrease_transfer_share (const std::string & *ShareToDecrease*)

Decrease by one the active count for the given share.

Called when a completed DTR leaves the queue.

5.308.2.4 void DataStaging::TransferShares::increase_transfer_share (const std::string & *ShareToIncrease*)

Increase by one the active count for the given share.

Called when a new DTR enters the queue.

The documentation for this class was generated from the following file:

- TransferShares.h

5.309 DataStaging::TransferSharesConf Class Reference

```
#include <TransferShares.h>
```

Public Types

- enum ShareType { USER, VO, GROUP, ROLE, NONE }

Public Member Functions

- TransferSharesConf (const std::string &type, const std::map< std::string, int > &ref_shares)
- TransferSharesConf ()

- void set_share_type (const std::string &type)
- void set_reference_share (const std::string &RefShare, int Priority)
- void set_reference_shares (const std::map< std::string, int > &shares)
- bool is_configured (const std::string &ShareToCheck)
- int get_basic_priority (const std::string &ShareToCheck)
- std::string conf () const
- std::string extract_share_info (DTR_ptr DTRToExtract)

5.309.1 Detailed Description

TransferSharesConf describes the configuration of TransferShares.

It allows reference shares to be defined with certain priorities. An instance of this class is used when creating a TransferShares object.

5.309.2 Member Enumeration Documentation

5.309.2.1 enum **DataStaging::TransferSharesConf::ShareType**

The criterion for assigning a share to a DTR.

Enumerator:

USER Shares are defined per DN of the user's proxy.

VO Shares are defined per VOMS VO of the user's proxy.

GROUP Shares are defined per VOMS group of the user's proxy.

ROLE Shares are defined per VOMS role of the user's proxy.

NONE No share criterion - all DTRs will be assigned to a single share.

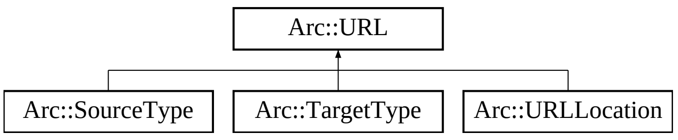
The documentation for this class was generated from the following file:

- TransferShares.h

5.310 Arc::URL Class Reference

```
#include <URL.h>
```

Inheritance diagram for Arc::URL:



Public Types

- enum Scope

Public Member Functions

- URL ()
- URL (const std::string &url)
- virtual ∼URL ()
- const std::string & Protocol () const
- void ChangeProtocol (const std::string &newprot)
- bool IsSecureProtocol () const
- const std::string & Username () const
- const std::string & Passwd () const
- const std::string & Host () const
- void ChangeHost (const std::string &newhost)
- int Port () const
- void ChangePort (int newport)
- const std::string & Path () const
- std::string FullPath () const
- std::string FullPathURIEncoded () const
- void ChangePath (const std::string &newpath)
- void ChangeFullPath (const std::string &newpath)
- const std::map< std::string, std::string > & HTTPOptions () const
- const std::string & HTTPOption (const std::string &option, const std::string &undefined="") const
- bool AddHTTPOption (const std::string &option, const std::string &value, bool overwrite=true)
- void RemoveHTTPOption (const std::string &option)
- const std::list< std::string > & LDAPAttributes () const
- void AddLDAPAttribute (const std::string &attribute)
- Scope LDAPScope () const
- void ChangeLDAPScope (const Scope newscope)
- const std::string & LDAPFilter () const
- void ChangeLDAPFilter (const std::string &newfilter)
- const std::map< std::string, std::string > & Options () const
- const std::string & Option (const std::string &option, const std::string &undefined="") const
- const std::map< std::string, std::string > & MetaDataOptions () const
- const std::string & MetaDataOption (const std::string &option, const std::string &undefined="") const
- bool AddOption (const std::string &option, const std::string &value, bool overwrite=true)
- bool AddOption (const std::string &option, bool overwrite=true)
- void AddMetaDataOption (const std::string &option, const std::string &value, bool overwrite=true)

- void AddLocation (const URLLocation &location)
- const std::list< URLLocation > & Locations () const
- const std::map< std::string, std::string > & CommonLocOptions () const
- const std::string & CommonLocOption (const std::string &option, const std::string &undefined="") const
- void RemoveOption (const std::string &option)
- void RemoveMetaDataOption (const std::string &option)
- virtual std::string str () const
- virtual std::string plainstr () const
- virtual std::string fullstr () const
- virtual std::string ConnectionURL () const
- bool operator< (const URL &url) const
- bool operator== (const URL &url) const
- operator bool () const
- bool StringMatches (const std::string &str) const
- std::map< std::string, std::string > ParseOptions (const std::string &optstring, char separator)

Static Public Member Functions

- static std::string OptionString (const std::map< std::string, std::string > &options, char separator)

Protected Member Functions

- void ParsePath (void)

Static Protected Member Functions

- static std::string BaseDN2Path (const std::string &)
- static std::string Path2BaseDN (const std::string &)

Protected Attributes

- std::string protocol
- std::string username
- std::string passwd
- std::string host
- bool ip6addr
- int port
- std::string path
- std::map< std::string, std::string > httpoptions
- std::map< std::string, std::string > metadataoptions
- std::list< std::string > ldapattributes
- Scope ldapscope

- std::string ldapfilter
- std::map< std::string, std::string > urloptions
- std::list< URLLocation > locations
- std::map< std::string, std::string > commonlocoptions
- bool valid

Friends

- std::ostream & operator<< (std::ostream &out, const URL &u)

5.310.1 Detailed Description

Class to hold general URLs.

The URL is split into protocol, hostname, port and path. This class tries to follow R-FC 3986 for spliting URLs, at least for protocol + host part. It also accepts local file paths which are converted to `file:path.` The usual system dependent file paths are supported. Relative paths are converted to absolute paths by prepending them with current working directory path. A file path can't start from # symbol. If the string representation of URL starts from '@' then it is treated as path to a file containing a list of URLs.

A URL is parsed in the following way:

[protocol:][//[username:passwd@][host][:port]][;urloptions[;...]][/path[?httpoption[&...]][-:metadataoption[:...]]]

The 'protocol' and 'host' parts are treated as case-insensitive and to avoid confusion are converted to lowercase in constructor. Note that 'path' is always converted to absolute path in constructor. The meaning of 'absolute' may depend upon URL type. For generic URL and local POSIX file paths that means path starts from / like

/path/to/file

For Windows paths absolute path may look like

C:\path\to\file

It is important to note that path still can be empty. For referencing local file using absolute path on POSIX filesystem one may use either

`file:///path/to/file` or `file:/path/to/file`

Relative path will look like

`file:to/file`

For local Windows files possible URLs are

file:C:\path\to\file or file:to\file

URLs representing LDAP resources have different structure of options following 'path' part:

ldap://host[:port][;urloptions[;...]][/path[?attributes[?scope[?filter]]]]

For LDAP URLs paths are converted from /key1=value1/.../keyN=valueN notation to keyN=valueN,...,key1=value1 and hence path does not contain leading /. If LDAP URL initially had path in second notation leading / is treated as separator only and is stripped.

URLs of indexing services optionally may have locations specified before 'host' part

protocol://[location[;location[;...]]@][host][:port]...

The structure of 'location' element is protocol specific.

5.310.2 Member Enumeration Documentation

5.310.2.1 enum Arc::URL::Scope

Scope for LDAP URLs

5.310.3 Constructor & Destructor Documentation

5.310.3.1 Arc::URL::URL ( )

Empty constructor. Necessary when the class is part of another class and the like.

5.310.3.2 Arc::URL::URL (const std::string & *url*)

Constructs a new URL from a string representation.

5.310.3.3 virtual Arc::URL::∼URL ( ) `[virtual]`

URL Destructor

5.310.4 Member Function Documentation

5.310.4.1 bool Arc::URL::AddHTTPOption (const std::string & *option,* const std::string & *value,* bool *overwrite* = `true`)

Adds a HTP option with the given value. Returns false if overwrite is false and option already exists, true otherwise.

5.310.4.2 void Arc::URL::AddLDAPAttribute (const std::string & *attribute*)

Adds an LDAP attribute.

5.310.4.3 void Arc::URL::AddLocation (const URLLocation & *location*)

Adds a Location

5.310.4.4 void Arc::URL::AddMetaDataOption (const std::string & *option,* const std::string & *value,* bool *overwrite* = `true`)

Adds a metadata option

5.310.4.5 bool Arc::URL::AddOption (const std::string & *option,* const std::string & *value,* bool *overwrite* = `true`)

Adds a URL option with the given value. Returns false if overwrite is false and option already exists, true otherwise. Note that some compilers may interpret AddOption("name", "value") as a call to AddOption(string, bool) so it is recommended to use explicit string types when calling this method.

5.310.4.6 bool Arc::URL::AddOption (const std::string & *option,* bool *overwrite* = `true`)

Adds a URL option where option has the format "name=value". Returns false if overwrite is true and option already exists or if option does not have the correct format. Returns true otherwise.

5.310.4.7 static std::string Arc::URL::BaseDN2Path (const std::string &) `[static, protected]`

a private method that converts an ldap basedn to a path.

5.310.4.8 void Arc::URL::ChangeFullPath (const std::string & *newpath*)

Changes the path of the URL and all options attached.

5.310.4.9 void Arc::URL::ChangeHost (const std::string & *newhost*)

Changes the hostname of the URL.

5.310.4.10 void Arc::URL::ChangeLDAPFilter (const std::string & *newfilter*)

Changes the LDAP filter.

5.310.4.11 void Arc::URL::ChangeLDAPScope (const Scope *newscope*)

Changes the LDAP scope.

5.310.4.12 void Arc::URL::ChangePath (const std::string & *newpath*)

Changes the path of the URL.

5.310.4.13 void Arc::URL::ChangePort (int *newport*)

Changes the port of the URL.

5.310.4.14 void Arc::URL::ChangeProtocol (const std::string & *newprot*)

Changes the protocol of the URL.

5.310.4.15 const std::string& Arc::URL::CommonLocOption (const std::string & *option,* const std::string & *undefined* = "") const

Returns the value of a common location option.

Parameters

option	The option whose value is returned.
undefined	This value is returned if the common location option is not defined.

5.310.4.16 const std::map<std::string, std::string>& Arc::URL::CommonLocOptions ( ) const

Returns the common location options if any.

5.310.4.17 virtual std::string Arc::URL::ConnectionURL ( ) const [virtual]

Returns a string representation with protocol, host and port only

5.310.4.18 std::string Arc::URL::FullPath ( ) const

Returns the path of the URL with all options attached.

5.310.4.19 std::string Arc::URL::FullPathURIEncoded ( ) const

Returns the path and all options, URI-encoded according to RFC 3986. Forward slashes ('/') in the path are not encoded but are encoded in the options.

5.310.4.20 virtual std::string Arc::URL::fullstr ( ) const [virtual]

Returns a string representation including options and locations

Reimplemented in Arc::URLLocation.

5.310.4.21 const std::string& Arc::URL::Host ( ) const

Returns the hostname of the URL.

5.310.4.22 const std::string& Arc::URL::HTTPOption (const std::string & *option,* const std::string & *undefined* = "") const

Returns the value of an HTTP option.

Parameters

option	The option whose value is returned.
undefined	This value is returned if the HTTP option is not defined.

5.310.4.23 const std::map<std::string, std::string>& Arc::URL::HTTPOptions ( ) const

Returns HTTP options if any.

5.310.4.24 bool Arc::URL::IsSecureProtocol ( ) const

Indicates whether the protocol is secure or not.

5.310.4.25 const std::list<std::string>& Arc::URL::LDAPAttributes ( ) const

Returns the LDAP attributes if any.

5.310.4.26 const std::string& Arc::URL::LDAPFilter ( ) const

Returns the LDAP filter.

5.310.4.27 Scope Arc::URL::LDAPScope ( ) const

Returns the LDAP scope.

5.310.4.28 const std::list<URLLocation>& Arc::URL::Locations ( ) const

Returns the locations if any.

5.310.4.29 const std::string& Arc::URL::MetaDataOption (const std::string & *option,* const std::string & *undefined* = "") const

Returns the value of a metadata option.

Parameters

option	The option whose value is returned.
undefined	This value is returned if the metadata option is not defined.

5.310.4.30 const std::map<std::string, std::string>& Arc::URL::MetaDataOptions ( ) const

Returns metadata options if any.

5.310.4.31 Arc::URL::operator bool ( ) const

Check if instance holds valid URL

5.310.4.32 bool Arc::URL::operator< (const URL & *url*) const

Compares one URL to another

5.310.4.33 bool Arc::URL::operator== (const URL & *url*) const

Is one URL equal to another?

5.310.4.34 const std::string& Arc::URL::Option (const std::string & *option*, const std::string & *undefined* = " ") const

Returns the value of a URL option.

Parameters

option	The option whose value is returned.
undefined	This value is returned if the URL option is not defined.

5.310.4.35 const std::map<std::string, std::string>& Arc::URL::Options ( ) const

Returns URL options if any.

5.310.4.36 static std::string Arc::URL::OptionString (const std::map< std::string, std::string > & *options*, char *separator*) [static]

Returns a string representation of the options given in the options map

5.310.4.37 std::map<std::string, std::string> Arc::URL::ParseOptions (const std::string & *optstring*, char *separator*)

Parse a string of options separated by separator into an attribute->value map

5.310.4.38 void Arc::URL::ParsePath (void) [protected]

Convenience method for spliting schema specific part into path and options

5.310.4.39 const std::string& Arc::URL::Passwd ( ) const

Returns the password of the URL.

5.310.4.40 const std::string& Arc::URL::Path ( ) const

Returns the path of the URL.

5.310.4.41 static std::string Arc::URL::Path2BaseDN (const std::string &) [static, protected]

a private method that converts an ldap path to a basedn.

5.310.4.42 virtual std::string Arc::URL::plainstr ( ) const [virtual]

Returns a string representation of the URL without any options

5.310.4.43 int Arc::URL::Port ( ) const

Returns the port of the URL.

5.310.4.44 const std::string& Arc::URL::Protocol ( ) const

Returns the protocol of the URL.

5.310.4.45 void Arc::URL::RemoveHTTPOption (const std::string & *option*)

Removes a HTTP option if exists.

Parameters

option	The option to remove.

5.310.4.46 void Arc::URL::RemoveMetaDataOption (const std::string & *option*)

Remove a metadata option if exits.

Parameters

option	The option to remove.

5.310.4.47 void Arc::URL::RemoveOption (const std::string & *option*)

Removes a URL option if exists.

Parameters

option	The option to remove.

5.310.4.48 virtual std::string Arc::URL::str ( ) const `[virtual]`

Returns a string representation of the URL including meta-options.

Reimplemented in Arc::URLLocation.

5.310.4.49 const std::string& Arc::URL::Username ( ) const

Returns the username of the URL.

5.310.5 Friends And Related Function Documentation

5.310.5.1 std::ostream& operator<< (std::ostream & *out*, const URL & *u*) `[friend]`

Overloaded operator << to print a URL.

5.310.6 Field Documentation

5.310.6.1 std::map<std::string, std::string> Arc::URL::commonlocoptions `[protected]`

common location options for index server URLs.

5.310.6.2 std::string Arc::URL::host `[protected]`

hostname of the url.

5.310.6.3 std::map<std::string, std::string> Arc::URL::httpoptions `[protected]`

HTTP options of the url.

5.310.6.4 bool Arc::URL::ip6addr `[protected]`

if host is IPv6 numerical address notation.

5.310.6.5 std::list<std::string> Arc::URL::ldapattributes [protected]

LDAP attributes of the url.

5.310.6.6 std::string Arc::URL::ldapfilter [protected]

LDAP filter of the url.

5.310.6.7 Scope Arc::URL::ldapscope [protected]

LDAP scope of the url.

5.310.6.8 std::list<URLLocation> Arc::URL::locations [protected]

locations for index server URLs.

5.310.6.9 std::map<std::string, std::string> Arc::URL::metadataoptions [protected]

Meta data options

5.310.6.10 std::string Arc::URL::passwd [protected]

password of the url.

5.310.6.11 std::string Arc::URL::path [protected]

the url path.

5.310.6.12 int Arc::URL::port [protected]

portnumber of the url.

5.310.6.13 std::string Arc::URL::protocol [protected]

the url protocol.

5.310.6.14 std::map<std::string, std::string> Arc::URL::urloptions [protected]

options of the url.

5.310.6.15 std::string Arc::URL::username [protected]

username of the url.

5.310.6.16 bool Arc::URL::valid [protected]

flag to describe validity of URL

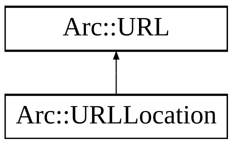
The documentation for this class was generated from the following file:

- URL.h

5.311 Arc::URLLocation Class Reference

```
#include <URL.h>
```

Inheritance diagram for Arc::URLLocation:



Public Member Functions

- URLLocation (const std::string &url="")
- URLLocation (const std::string &url, const std::string &name)
- URLLocation (const URL &url)
- URLLocation (const URL &url, const std::string &name)
- URLLocation (const std::map< std::string, std::string > &options, const std::string &name)
- virtual ~URLLocation ()
- const std::string & Name () const
- virtual std::string str () const
- virtual std::string fullstr () const

Protected Attributes

- std::string name

5.311.1 Detailed Description

Class to hold a resolved URL location.

It is specific to file indexing service registrations.

5.311.2 Constructor & Destructor Documentation

5.311.2.1 Arc::URLLocation::URLLocation (const std::string & *url* = "")

Creates a URLLocation from a string representaion.

5.311.2.2 Arc::URLLocation::URLLocation (const std::string & *url*, const std::string & *name*)

Creates a URLLocation from a string representaion and a name.

5.311.2.3 Arc::URLLocation::URLLocation (const URL & *url*)

Creates a URLLocation from a URL.

5.311.2.4 Arc::URLLocation::URLLocation (const URL & *url*, const std::string & *name*)

Creates a URLLocation from a URL and a name.

5.311.2.5 Arc::URLLocation::URLLocation (const std::map< std::string, std::string > & *options*, const std::string & *name*)

Creates a URLLocation from options and a name.

5.311.2.6 virtual Arc::URLLocation::∼URLLocation ( ) `[virtual]`

URLLocation destructor.

5.311.3 Member Function Documentation

5.311.3.1 virtual std::string Arc::URLLocation::fullstr ( ) const `[virtual]`

Returns a string representation including options and locations

Reimplemented from Arc::URL.

5.311.3.2 const std::string& Arc::URLLocation::Name ( ) const

Returns the URLLocation name.

5.311.3.3 virtual std::string Arc::URLLocation::str ( ) const `[virtual]`

Returns a string representation of the URLLocation.

Reimplemented from Arc::URL.

5.311.4 Field Documentation

5.311.4.1 std::string **Arc::URLLocation::name** [protected]

the URLLocation name as registered in the indexing service.

The documentation for this class was generated from the following file:

- URL.h

5.312 Arc::User Class Reference

The documentation for this class was generated from the following file:

- User.h

5.313 Arc::UserConfig Class Reference

```
#include <UserConfig.h>
```

Public Member Functions

- UserConfig (initializeCredentialsType initializeCredentials=initializeCredentials-Type())
- UserConfig (const std::string &conffile, initializeCredentialsType initialize-Credentials=initializeCredentialsType(), bool loadSysConfig=true)
- UserConfig (const std::string &conffile, const std::string &jfile, initialize-CredentialsType initializeCredentials=initializeCredentialsType(), bool loadSys-Config=true)
- UserConfig (const long int &ptraddr)
- bool InitializeCredentials (initializeCredentialsType initializeCredentials)
- bool CredentialsFound () const
- bool LoadConfigurationFile (const std::string &conffile, bool ignoreJobList-File=true)
- bool SaveToFile (const std::string &filename) const
- void ApplyToConfig (BaseConfig &ccfg) const
- operator bool () const
- bool operator! () const
- bool JobListFile (const std::string &path)
- const std::string & JobListFile () const
- bool AddServices (const std::list< std::string > &services, ServiceType st)
- bool AddServices (const std::list< std::string > &selected, const std::list< std-::string > &rejected, ServiceType st)
- const std::list< std::string > & GetSelectedServices (ServiceType st) const

- const std::list< std::string > & GetRejectedServices (ServiceType st) const
- void ClearSelectedServices ()
- void ClearSelectedServices (ServiceType st)
- void ClearRejectedServices ()
- void ClearRejectedServices (ServiceType st)
- bool Timeout (int newTimeout)
- int Timeout () const
- bool Verbosity (const std::string &newVerbosity)
- const std::string & Verbosity () const
- bool Broker (const std::string &name)
- bool Broker (const std::string &name, const std::string &argument)
- const std::pair< std::string, std::string > & Broker () const
- bool Bartender (const std::vector< URL > &urls)
- void AddBartender (const URL &url)
- const std::vector< URL > & Bartender () const
- bool VOMSESPath (const std::string &path)
- const std::string & VOMSESPath ()
- bool UserName (const std::string &name)
- const std::string & UserName () const
- bool Password (const std::string &newPassword)
- const std::string & Password () const
- bool ProxyPath (const std::string &newProxyPath)
- const std::string & ProxyPath () const
- bool CertificatePath (const std::string &newCertificatePath)
- const std::string & CertificatePath () const
- bool KeyPath (const std::string &newKeyPath)
- const std::string & KeyPath () const
- bool KeyPassword (const std::string &newKeyPassword)
- const std::string & KeyPassword () const
- bool KeySize (int newKeySize)
- int KeySize () const
- bool CACertificatePath (const std::string &newCACertificatePath)
- const std::string & CACertificatePath () const
- bool CACertificatesDirectory (const std::string &newCACertificatesDirectory)
- const std::string & CACertificatesDirectory () const
- bool CertificateLifeTime (const Period &newCertificateLifeTime)
- const Period & CertificateLifeTime () const
- bool SLCS (const URL &newSLCS)
- const URL & SLCS () const
- bool StoreDirectory (const std::string &newStoreDirectory)
- const std::string & StoreDirectory () const
- bool JobDownloadDirectory (const std::string &newDownloadDirectory)
- const std::string & JobDownloadDirectory () const
- bool IdPName (const std::string &name)
- const std::string & IdPName () const
- bool OverlayFile (const std::string &path)

- const std::string & OverlayFile () const
- bool UtilsDirPath (const std::string &dir)
- const std::string & UtilsDirPath () const
- void SetUser (const User &u)
- const User & GetUser () const

Static Public Attributes

- static const std::string ARCUSERDIRECTORY
- static const std::string SYSCONFIG
- static const std::string SYSCONFIGARCLOC
- static const std::string DEFAULTCONFIG
- static const std::string EXAMPLECONFIG
- static const int DEFAULT_TIMEOUT = 20
- static const std::string DEFAULT_BROKER

5.313.1 Detailed Description

User configuration class

This class provides a container for a selection of various attributes/parameters which can be configured to needs of the user, and can be read by implementing instances or programs. The class can be used in two ways. One can create a object from a configuration file, or simply set the desired attributes by using the setter method, associated with every setable attribute. The list of attributes which can be configured in this class are:

- certificatepath / CertificatePath(const std::string&)
- keypath / KeyPath(const std::string&)
- proxypath / ProxyPath(const std::string&)
- cacertificatesdirectory / CACertificatesDirectory(const std::string&)
- cacertificatepath / CACertificatePath(const std::string&)
- timeout / Timeout(int)
- joblist / JobListFile(const std::string&)
- defaultservices / AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType)
- rejectservices / AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType)
- verbosity / Verbosity(const std::string&)
- brokername / Broker(const std::string&) or Broker(const std::string&, const std::string&)

- brokerarguments / Broker(const std::string&) or Broker(const std::string&, const std::string&)
- bartender / Bartender(const std::list<URL>&)
- vomsserverpath / VOMSESPath(const std::string&)
- username / UserName(const std::string&)
- password / Password(const std::string&)
- keypassword / KeyPassword(const std::string&)
- keysize / KeySize(int)
- certificatelifetime / CertificateLifeTime(const Period&)
- slcs / SLCS(const URL&)
- storedirectory / StoreDirectory(const std::string&)
- jobdownloaddirectory / JobDownloadDirectory(const std::string&)
- idpname / IdPName(const std::string&)

where the first term is the name of the attribute used in the configuration file, and the second term is the associated setter method (for more information about a given attribute see the description of the setter method).

The configuration file should have a INI-style format and the IniConfig class will thus be used to parse the file. The above mentioned attributes should be placed in the common section. Another section is also valid in the configuration file, which is the alias section. Here it is possible to define aliases representing one or multiple services. These aliases can be used in the AddServices(const std::list<std::string>&, ServiceType) and AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType) methods.

The UserConfig class also provides a method InitializeCredentials() for locating user credentials by searching in different standard locations. The CredentialsFound() method can be used to test if locating the credentials succeeded.

5.313.2 Constructor & Destructor Documentation

5.313.2.1 Arc::UserConfig::UserConfig (**initializeCredentialsType** *initializeCredentials* = **initializeCredentialsType** ())

Create a UserConfig object.

The UserConfig object created by this constructor initializes only default values, and if specified by the *initializeCredentials* boolean credentials will be tried initialized using the InitializeCredentials() method. The object is only non-valid if initialization of credentials fails which can be checked with the operator bool() method.

Parameters

initialize-Credentials	is a optional boolean indicating if the InitializeCredentials() method should be invoked, the default is `true`.

See also

InitializeCredentials()
operator bool()

5.313.2.2 Arc::UserConfig::UserConfig (const std::string & *conffile*, initializeCredentialsType *initializeCredentials* = initializeCredentialsType `()`, bool *loadSysConfig* = `true`)

Create a UserConfig object.

The UserConfig object created by this constructor will, if specified by the *loadSysConfig* boolean, first try to load the system configuration file by invoking the LoadConfiguration-File() method, and if this fails a ::WARNING is reported. Then the configuration file passed will be tried loaded using the before mentioned method, and if this fails an ::ERR-OR is reported, and the created object will be non-valid. Note that if the passed file path is empty the example configuration will be tried copied to the default configuration file path specified by DEFAULTCONFIG. If the example file cannot be copied one or more ::WARNING messages will be reported and no configration will be loaded. If loading the configurations file succeeded and if *initializeCredentials* is `true` then credentials will be initialized using the InitializeCredentials() method, and if no valid credentials are found the created object will be non-valid.

Parameters

conffile	is the path to a INI-configuration file.
initialize-Credentials	is a boolean indicating if credentials should be initialized, the default is `true`.
loadSys-Config	is a boolean indicating if the system configuration file should be loaded aswell, the default is `true`.

See also

LoadConfigurationFile(const std::string&, bool)
InitializeCredentials()
operator bool()
SYSCONFIG
EXAMPLECONFIG

5.313.2.3 Arc::UserConfig::UserConfig (const std::string & *conffile*, const std::string & *jfile*, initializeCredentialsType *initializeCredentials* = initializeCredentialsType `()`, bool *loadSysConfig* = `true`)

Create a UserConfig object.

The UserConfig object created by this constructor does only differ from the UserConfig(const std::string&, bool, bool) constructor in that it is possible to pass the path of the job list file directly to this constructor. If the job list file *joblistfile* is empty, the behaviour of this constructor is exactly the same as the before mentioned, otherwise the job list file will be initilized by invoking the setter method JobListFile(const std::string&). If it fails the created object will be non-valid, otherwise the specified configuration file *conffile* will be loaded with the *ignoreJobListFile* argument set to `true`.

Parameters

conffile	is the path to a INI-configuration file
jfile	is the path to a (non-)existing job list file.
initialize-Credentials	is a boolean indicating if credentials should be initialized, the default is `true`.
loadSys-Config	is a boolean indicating if the system configuration file should be loaded aswell, the default is `true`.

See also

JobListFile(const std::string&)
LoadConfigurationFile(const std::string&, bool)
InitializeCredentials()
operator bool()

5.313.2.4 Arc::UserConfig::UserConfig (const long int & *ptraddr*)

Language binding constructor.

The passed long int should be a pointer address to a UserConfig object, and this address is then casted into this UserConfig object.

Parameters

ptraddr	is an memory address to a UserConfig object.

5.313.3 Member Function Documentation

5.313.3.1 void Arc::UserConfig::AddBartender (const URL & *url*) `[inline]`

Set bartenders, used to contact Chelonia.

Takes as input a Bartender URL and adds this to the list of bartenders.

Parameters

url	is a URL to be added to the list of bartenders.

See also

Bartender(const std::list<URL>&)
Bartender() const

5.313.3.2 bool Arc::UserConfig::AddServices (const std::list< std::string > & *services*, ServiceType *st*)

Add selected and rejected services.

This method adds selected services and adds services to reject from the specified list *services*, which contains string objects. The syntax of a single element in the list must be expressed in the following two formats:

$$[-] < flavour >:< service\_url > |[-] < alias >$$

where the optional '-' indicate that the service should be added to the private list of services to reject. In the first format the <flavour> part indicates the type of ACC plugin to use when contacting the service, which is specified by the URL <service_-url>, and in the second format the <alias> part specifies a alias defined in a parsed configuration file, note that the alias must not contain any of the charaters ':', '.', ' ' or '\t'. If a alias cannot be resolved an ::ERROR will be reported to the logger and the method will return false. If a element in the list *services* cannot be parsed an ::ERROR will be reported, and the element is skipped.

Two attributes are indirectly associated with this setter method 'defaultservices' and 'rejectservices'. The values specified with the 'defaultservices' attribute will be added to the list of selected services, and like-wise with the 'rejectservices' attribute.

Parameters

services	is a list of services to either select or reject.
st	indicates the type of the specfied services.

Returns

This method returns `false` in case an alias cannot be resolved. In any other case `true` is returned.

See also

AddServices(const std::string&, const std::string&, ServiceType)
GetSelectedServices()
GetRejectedServices()
ClearSelectedServices()
ClearRejectedServices()
LoadConfigurationFile()

5.313.3.3 bool Arc::UserConfig::AddServices (const std::list< std::string > & *selected*, const std::list< std::string > & *rejected*, ServiceType *st*)

Add selected and rejected services.

The only diffence in behaviour of this method compared to the AddServices(const std-::list<std::string>&, ServiceType) method is the input parameters and the format these parameters should follow. Instead of having an optional '-' in front of the string selected and rejected services should be specified in the two different arguments.

Two attributes are indirectly associated with this setter method 'defaultservices' and 'rejectservices'. The values specified with the 'defaultservices' attribute will be added to the list of selected services, and like-wise with the 'rejectservices' attribute.

Parameters

selected	is a list of services which will be added to the selected services of this object.
rejected	is a list of services which will be added to the rejected services of this object.
st	specifies the ServiceType of the services to add.

Returns

This method return `false` in case an alias cannot be resolved. In any other case `true` is returned.

See also

AddServices(const std::list<std::string>&, ServiceType)
GetSelectedServices()
GetRejectedServices()
ClearSelectedServices()
ClearRejectedServices()
LoadConfigurationFile()

5.313.3.4 void Arc::UserConfig::ApplyToConfig (BaseConfig & *ccfg*) const

Apply credentials to BaseConfig.

This methods sets the BaseConfig credentials to the credentials contained in this object. It also passes user defined configuration overlay if any.

See also

InitializeCredentials()
CredentialsFound()
BaseConfig

Parameters

ccfg	a BaseConfig object which will configured with the credentials of this object.

5.313.3.5 bool Arc::UserConfig::Bartender (const std::vector< URL > & *urls*) `[inline]`

Set bartenders, used to contact Chelonia.

Takes as input a vector of Bartender URLs.

The attribute associated with this setter method is 'bartender'.

Parameters

urls	is a list of URL object to be set as bartenders.

Returns

This method always returns `true`.

See also

AddBartender(const URL&)
Bartender() const

5.313.3.6 const std::vector<URL>& Arc::UserConfig::Bartender ( ) const `[inline]`

Get bartenders.

Returns a list of Bartender URLs

Returns

The list of bartender URL objects is returned.

See also

Bartender(const std::list<URL>&)
AddBartender(const URL&)

5.313.3.7 bool Arc::UserConfig::Broker (const std::string & *name*)

Set broker to use in target matching.

The string passed to this method should be in the format:

$$< name > [:< argument >]$$

where the <name> is the name of the broker and cannot contain any ':', and the optional <argument> should contain arguments which should be passed to the broker.

Two attributes are associated with this setter method 'brokername' and 'brokerarguments'.

Parameters

name	the broker name and argument specified in the format given above.

Returns

This method allways returns `true`.

See also

Broker
Broker(const std::string&, const std::string&)
Broker() const
DEFAULT_BROKER

5.313.3.8 bool Arc::UserConfig::Broker (const std::string & *name*, const std::string & *argument*) `[inline]`

Set broker to use in target matching.

As opposed to the Broker(const std::string&) method this method sets broker name and arguments directly from the passed two arguments.

Two attributes are associated with this setter method 'brokername' and 'brokerarguments'.

Parameters

name	is the name of the broker.
argument	is the arguments of the broker.

Returns

This method always returns `true`.

See also

Broker
Broker(const std::string&)
Broker() const
DEFAULT_BROKER

5.313.3.9 const std::pair<std::string, std::string>& Arc::UserConfig::Broker ( ) const `[inline]`

Get the broker and corresponding arguments.

The returned pair contains the broker name as the first component and the argument as the second.

See also

Broker(const std::string&)
Broker(const std::string&, const std::string&)
DEFAULT_BROKER

5.313.3.10 bool Arc::UserConfig::CACertificatePath (const std::string & *newCACertificatePath*) `[inline]`

Set CA-certificate path.

The path to the file containing CA-certificate will be set when calling this method. - This configuration parameter is deprecated - use CACertificatesDirectory instead. Only arcslcs uses it.

The attribute associated with this setter method is 'cacertificatepath'.

Parameters

newCA-Certificate-Path	is the path to the CA-certificate.

Returns

This method always returns `true`.

See also

CACertificatePath() const

5.313.3.11 const std::string& Arc::UserConfig::CACertificatePath ( ) const `[inline]`

Get path to CA-certificate.

Retrieve the path to the file containing CA-certificate. This configuration parameter is deprecated.

Returns

The path to the CA-certificate is returned.

See also

CACertificatePath(const std::string&)

5.313.3.12 bool Arc::UserConfig::CACertificatesDirectory (const std::string & *newCACertificatesDirectory*) `[inline]`

Set path to CA-certificate directory.

The path to the directory containing CA-certificates will be set when calling this method. Note that the InitializeCredentials() method will also try to set this path, by searching in different locations.

The attribute associated with this setter method is 'cacertificatesdirectory'.

Parameters

newCA-Certificates-Directory	is the path to the CA-certificate directory.

Returns

This method always returns `true`.

See also

InitializeCredentials()
CredentialsFound() const
CACertificatesDirectory() const

5.313.3.13 const std::string& Arc::UserConfig::CACertificatesDirectory ( ) const `[inline]`

Get path to CA-certificate directory.

Retrieve the path to the CA-certificate directory.

Returns

The path to the CA-certificate directory is returned.

See also

InitializeCredentials()
CredentialsFound() const
CACertificatesDirectory(const std::string&)

5.313.3.14 bool Arc::UserConfig::CertificateLifeTime (const Period & *newCertificateLifeTime*) `[inline]`

Set certificate life time.

Sets lifetime of user certificate which will be obtained from Short Lived Credentials - Service.

The attribute associated with this setter method is 'certificatelifetime'.

Parameters

new-Certificate-LifeTime	is the life time of a certificate, as a Period object.

Returns

This method always returns `true`.

See also

CertificateLifeTime() const

5.313.3.15 const Period& Arc::UserConfig::CertificateLifeTime ( ) const `[inline]`

Get certificate life time.

Gets lifetime of user certificate which will be obtained from Short Lived Credentials - Service.

Returns

The certificate life time is returned as a Period object.

See also

CertificateLifeTime(const Period&)

5.313.3.16 bool Arc::UserConfig::CertificatePath (const std::string & *newCertificatePath*) `[inline]`

Set path to certificate.

The path to user certificate will be set by this method. The path to the correcsponding key can be set with the KeyPath(const std::string&) method. Note that the Initialize-Credentials() method will also try to set this path, by searching in different locations.

The attribute associated with this setter method is 'certificatepath'.

Parameters

new-Certificate-Path	is the path to the new certificate.

Returns

This method always returns `true`.

See also

InitializeCredentials()
CredentialsFound() const
CertificatePath() const
KeyPath(const std::string&)

5.313.3.17 const std::string& Arc::UserConfig::CertificatePath ( ) const [inline]

Get path to certificate.

The path to the cerficate is returned when invoking this method.

Returns

The certificate path is returned.

See also

InitializeCredentials()
CredentialsFound() const
CertificatePath(const std::string&)
KeyPath() const

5.313.3.18 void Arc::UserConfig::ClearRejectedServices ( )

Clear selected services.

Calling this method will cause the internally stored rejected services to be cleared.

See also

ClearRejectedServices(ServiceType)
ClearSelectedServices()
AddServices(const std::list<std::string>&, ServiceType)
AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType)
GetRejectedServices()

5.313.3.19 void Arc::UserConfig::ClearRejectedServices (ServiceType *st*)

Clear rejected services with specified ServiceType.

Calling this method will cause the internally stored rejected services with the ServiceType *st* to be cleared.

See also

ClearRejectedServices()
ClearSelectedServices(ServiceType)
AddServices(const std::list<std::string>&, ServiceType)
AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType)
GetRejectedServices()

5.313.3.20 void Arc::UserConfig::ClearSelectedServices ( )

Clear selected services.

Calling this method will cause the internally stored selected services to be cleared.

See also

ClearSelectedServices(ServiceType)
ClearRejectedServices()
AddServices(const std::list<std::string>&, ServiceType)
AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType)
GetSelectedServices()

5.313.3.21 void Arc::UserConfig::ClearSelectedServices (ServiceType *st*)

Clear selected services with specified ServiceType.

Calling this method will cause the internally stored selected services with the ServiceType *st* to be cleared.

See also

ClearSelectedServices()
ClearRejectedServices(ServiceType)
AddServices(const std::list<std::string>&, ServiceType)
AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType)
GetSelectedServices()

5.313.3.22 bool Arc::UserConfig::CredentialsFound ( ) const [inline]

Validate credential location.

Valid credentials consists of a combination of a path to existing CA-certificate directory and either a path to existing proxy or a path to existing user key/certificate pair. If valid credentials are found this method returns `true`, otherwise `false` is returned.

Returns

`true` if valid credentials are found, otherwise `false`.

See also

InitializeCredentials()

5.313.3.23 const std::list<std::string>& Arc::UserConfig::GetRejectedServices (ServiceType *st*) const

Get rejected services.

Get the rejected services with the ServiceType specified by *st*.

Parameters

st	specifies which ServiceType should be returned by the method.

Returns

The rejected services is returned.

See also

AddServices(const std::list<std::string>&, ServiceType)
AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType)
GetSelectedServices(ServiceType)
ClearRejectedServices()

5.313.3.24 const std::list<std::string>& Arc::UserConfig::GetSelectedServices (ServiceType *st*) const

Get selected services.

Get the selected services with the ServiceType specified by *st*.

Parameters

st	specifies which ServiceType should be returned by the method.

Returns

The selected services is returned.

See also

AddServices(const std::list<std::string>&, ServiceType)
AddServices(const std::list<std::string>&, const std::list<std::string>&, Service-Type)
GetRejectedServices(ServiceType) const
ClearSelectedServices()

5.313.3.25 const User& Arc::UserConfig::GetUser ( ) const `[inline]`

Get User for filesystem access.

Returns

The user identity to use for file system access

See also

SetUser(const User&)

5.313.3.26 bool Arc::UserConfig::IdPName (const std::string & *name*) `[inline]`

Set IdP name.

Sets Identity Provider name (Shibboleth) to which user belongs. It is used for contacting Short Lived Certificate Service.

The attribute associated with this setter method is 'idpname'.

Parameters

name	is the new IdP name.

Returns

This method always returns `true`.

See also

5.313.3.27 const std::string& Arc::UserConfig::IdPName ( ) const `[inline]`

Get IdP name.

Gets Identity Provider name (Shibboleth) to which user belongs.

Returns

The IdP name

See also

IdPName(const std::string&)

5.313.3.28 bool Arc::UserConfig::InitializeCredentials (initializeCredentialsType *initializeCredentials*)

Initialize user credentials.

The location of the user credentials will be tried located when calling this method and stored internally when found. The method searches in different locations. Depending on value of initializeCredentials this method behaves differently. Following is an explanation for RequireCredentials. For less strict values see information below. First the user proxy or the user key/certificate pair is tried located in the following order:

- Proxy path specified by the environment variable X509_USER_PROXY. If value is set and corresponding file does not exist it considered to be an error and no other locations are tried. If found no more proxy paths are tried.
- Current proxy path as passed to the contructor, explicitly set using the setter method ProxyPath(const std::string&) or read from configuration by constructor or LoadConfiguartionFile() method. If value is set and corresponding file does not exist it considered to be an error and no other locations are tried. If found no more proxy paths are tried.
- Proxy path made of x509up_u token concatenated with the user numerical ID located in the OS temporary directory. It is NOT an error if corresponding file does not exist and processing continues.
- Key/certificate paths specified by the environment variables X509_USER_KEY and X509_USER_CERT. If values are set and corresponding files do not exist it considered to be an error and no other locations are tried. Error message is supressed if proxy was previously found.
- Current key/certificate paths passed to the contructor or explicitly set using the setter methods KeyPath(const std::string&) and CertificatePath(const std::string&) or read from configuration by constructor or LoadConfiguartionFile() method. If values are set and corresponding files do not exist it is an error and no other locations are tried. Error message is supressed if proxy was previously found.
- Key/certificate paths ∼/.arc/usercert.pem and ∼/.arc/userkey.pem respectively are tried. It is not an error if not found.
- Key/certificate paths ∼/.globus/usercert.pem and ∼/.globus/userkey.pem respectively are tried. It is not an error if not found.

- Key/certificate paths created by concatenation of ARC installation location and /etc/arc/usercert.pem and /etc/arc/userkey.pem respectively are tried. It is not an error if not found.
- Key/certificate located in current working directory are tried.
- If neither proxy nor key/certificate files are found this is considered to be an error.

Along with the proxy and key/certificate pair, the path of the directory containing CA certificates is also located. The presence of directory will be checked in the following order and first found is accepted:

- Path specified by the X509_CERT_DIR environment variable. It is an error if value is set and directory does not exist.
- Current path explicitly specified by using the setter method CACertificates-Directory() or read from configuration by constructor or LoadConfiguartionFile() method. It is an error if value is set and directory does not exist.
- Path ∼/.globus/certificates. It is not an error if it does not exist.
- Path created by concatenating the ARC installation location and /etc/certificates. It is not an error if it does not exist.
- Path created by concatenating the ARC installation location and /share/certificates. It is not an error if it does not exist.
- Path /etc/grid-security/certificates.

It is an error if none of the directories above exist.

In case of initializeCredentials == TryCredentials method behaves same way like in case RequireCredentials except it does not report errors through its Logger object and does not return false.

If NotTryCredentials is used method does not check for presence of credentials. It behaves like if corresponding files are always present.

And in case of SkipCredentials method does nothing.

All options with SkipCA∗ prefix behaves similar to those without prefix except the path of the directory containing CA certificates is completely ignored.

See also

CredentialsFound()
ProxyPath(const std::string&)
KeyPath(const std::string&)
CertificatePath(const std::string&)
CACertificatesDirectory(const std::string&)

5.313.3.29 bool Arc::UserConfig::JobDownloadDirectory (const std::string & *newDownloadDirectory*) [inline]

Set download directory.

Sets directory which will be used to download the job directory using arcget command.

The attribute associated with this setter method is 'jobdownloaddirectory'.

Parameters

newDownloadDirectory	is the path to the download directory.

Returns

This method always returns `true`.

See also

5.313.3.30 const std::string& Arc::UserConfig::JobDownloadDirectory ( ) const [inline]

Get download directory.

returns directory which will be used to download the job directory using arcget command.

The attribute associated with the method is 'jobdownloaddirectory'.

Returns

This method returns the job download directory.

See also

5.313.3.31 bool Arc::UserConfig::JobListFile (const std::string & *path*)

Set path to job list file.

The method takes a path to a file which will be used as the job list file for storing and reading job information. If the specified path *path* does not exist a empty job list file will be tried created. If creating the job list file in any way fails *false* will be returned and a ::ERROR message will be reported. Otherwise *true* is returned. If the directory containing the file does not exist, it will be tried created. The method will also return *false* if the file is not a regular file.

The attribute associated with this setter method is 'joblist'.

Parameters

path	the path to the job list file.

Returns

If the job list file is a regular file or if it can be created *true* is returned, otherwise *false* is returned.

See also

JobListFile() const

5.313.3.32 const std::string& Arc::UserConfig::JobListFile ( ) const [inline]

Get a reference to the path of the job list file.

The job list file is used to store and fetch information about submitted computing jobs to computing services. This method will return the path to the specified job list file.

Returns

The path to the job list file is returned.

See also

JobListFile(const std::string&)

5.313.3.33 bool Arc::UserConfig::KeyPassword (const std::string & *newKeyPassword*) [inline]

Set password for generated key.

Set password to be used to encode private key of credentials obtained from Short Lived Credentials Service.

The attribute associated with this setter method is 'keypassword'.

Parameters

newKey-Password	is the new password to the key.

Returns

This method always returns `true`.

See also

KeyPassword() const
KeyPath(const std::string&)
KeySize(int)

5.313.3.34 const std::string& Arc::UserConfig::KeyPassword ( ) const [inline]

Get password for generated key.

Get password to be used to encode private key of credentials obtained from Short Lived Credentials Service.

Returns

The key password is returned.

See also

KeyPassword(const std::string&)
KeyPath() const
KeySize() const

5.313.3.35 bool Arc::UserConfig::KeyPath (const std::string & *newKeyPath*) [inline]

Set path to key.

The path to user key will be set by this method. The path to the corresponding certificate can be set with the CertificatePath(const std::string&) method. Note that the Initialize-Credentials() method will also try to set this path, by searching in different locations.

The attribute associated with this setter method is 'keypath'.

Parameters

newKeyPath	is the path to the new key.

Returns

This method always returns `true`.

See also

InitializeCredentials()
CredentialsFound() const
KeyPath() const
CertificatePath(const std::string&)
KeyPassword(const std::string&)
KeySize(int)

5.313.3.36 const std::string& Arc::UserConfig::KeyPath ( ) const [inline]

Get path to key.

The path to the key is returned when invoking this method.

Returns

The path to the user key is returned.

See also

InitializeCredentials()
CredentialsFound() const
KeyPath(const std::string&)
CertificatePath() const
KeyPassword() const
KeySize() const

5.313.3.37 bool Arc::UserConfig::KeySize (int *newKeySize*) [inline]

Set key size.

Set size/strengt of private key of credentials obtained from Short Lived Credentials - Service.

The attribute associated with this setter method is 'keysize'.

Parameters

newKeySize	is the size, an an integer, of the key.

Returns

This method always returns `true`.

See also

KeySize() const
KeyPath(const std::string&)
KeyPassword(const std::string&)

5.313.3.38 int Arc::UserConfig::KeySize ( ) const [inline]

Get key size.

Get size/strengt of private key of credentials obtained from Short Lived Credentials - Service.

Returns

The key size, as an integer, is returned.

See also

KeySize(int)
KeyPath() const
KeyPassword() const

5.313.3.39 bool Arc::UserConfig::LoadConfigurationFile (const std::string & *conffile*, bool *ignoreJobListFile* = `true`)

Load specified configuration file.

The configuration file passed is parsed by this method by using the IniConfig class. If the parsing is unsuccessful a ::WARNING is reported.

The format of the configuration file should follow that of INI, and every attribute present in the file is only allowed once, if otherwise a ::WARNING will be reported. The file can contain at most two sections, one named common and the other name alias. If other sections exist a ::WARNING will be reported. Only the following attributes is allowed in the common section of the configuration `file:`

- certificatepath (CertificatePath(const std::string&))
- keypath (KeyPath(const std::string&))
- proxypath (ProxyPath(const std::string&))
- cacertificatesdirectory (CACertificatesDirectory(const std::string&))
- cacertificatepath (CACertificatePath(const std::string&))
- timeout (Timeout(int))
- joblist (JobListFile(const std::string&))
- defaultservices (AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType))
- rejectservices (AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType))
- verbosity (Verbosity(const std::string&))
- brokername (Broker(const std::string&) or Broker(const std::string&, const std::string&))
- brokerarguments (Broker(const std::string&) or Broker(const std::string&, const std::string&))
- bartender (Bartender(const std::list<URL>&))

- vomsserverpath (VOMSESPath(const std::string&))
- username (UserName(const std::string&))
- password (Password(const std::string&))
- keypassword (KeyPassword(const std::string&))
- keysize (KeySize(int))
- certificatelifetime (CertificateLifeTime(const Period&))
- slcs (SLCS(const URL&))
- storedirectory (StoreDirectory(const std::string&))
- jobdownloaddirectory (JobDownloadDirectory(const std::string&))
- idpname (IdPName(const std::string&))

where the method in parentheses is the associated setter method. If other attributes exist in the common section a ::WARNING will be reported for each of these attributes. In the alias section aliases can be defined, and should represent a selection of services. The alias can then refered to by input to the AddServices(const std::list<std::string>&, ServiceType) and AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType) methods. An alias can not contain any of the characters '.', ':', ' ' or '\t' and should be defined as follows:

$<alias\_name>=<service\_type>:<flavour>:<service\_url>|<alias\_ref>[...]$

where <alias_name> is the name of the defined alias, <service_type> is the service type in lower case, <flavour> is the type of middleware plugin to use, <service_url> is the URL which should be used to contact the service and <alias_ref> is another defined alias. The parsed aliases will be stored internally and resolved when needed. If a alias already exist, and another alias with the same name is parsed then this other alias will overwrite the existing alias.

Parameters

conffile	is the path to the configuration file.
ignoreJob-ListFile	is a optional boolean which indicates whether the joblistfile attribute in the configuration file should be ignored. Default is to ignored it (`true`).

Returns

If loading the configuration file succeeds `true` is returned, otherwise `false` is returned.

See also

SaveToFile()

5.313.3.40 Arc::UserConfig::operator bool (void) const `[inline]`

Check for validity.

The validity of an object created from this class can be checked using this casting operator. An object is valid if the constructor did not encounter any errors.

See also

operator!()

5.313.3.41 bool Arc::UserConfig::operator! (void) const `[inline]`

Check for non-validity.

See operator bool() for a description.

See also

operator bool()

5.313.3.42 bool Arc::UserConfig::OverlayFile (const std::string & *path*) `[inline]`

Set path to configuration overlay file.

Content of specified file is a backdoor to configuration XML generated from information stored in this class. The content of file is passed to BaseConfig class in ApplyToConfig(-BaseConfig&) then merged with internal configuration XML representation. This feature is meant for quick prototyping/testing/tuning of functionality without rewriting code. It is meant for developers and most users won't need it.

The attribute associated with this setter method is 'overlayfile'.

Parameters

path	is the new overlay file path.

Returns

This method always returns `true`.

See also

5.313.3.43 const std::string& Arc::UserConfig::OverlayFile ( ) const `[inline]`

Get path to configuration overlay file.

Returns

The overlay file path

See also

OverlayFile(const std::string&)

5.313.3.44 bool Arc::UserConfig::Password (const std::string & *newPassword*) `[inline]`

Set password.

Set password which is used for requesting credentials from Short Lived Credentials Service.

The attribute associated with this setter method is 'password'.

Parameters

newPassword	is the new password to set.

Returns

This method always returns true.

See also

Password() const

5.313.3.45 const std::string& Arc::UserConfig::Password ( ) const `[inline]`

Get password.

Get password which is used for requesting credentials from Short Lived Credentials Service.

Returns

The password is returned.

See also

Password(const std::string&)

5.313.3.46 bool Arc::UserConfig::ProxyPath (const std::string & *newProxyPath*) `[inline]`

Set path to user proxy.

This method will set the path of the user proxy. Note that the InitializeCredentials() method will also try to set this path, by searching in different locations.

The attribute associated with this setter method is 'proxypath'

Parameters

newProxyPath	is the path to a user proxy.

Returns

This method always returns `true`.

See also

InitializeCredentials()
CredentialsFound()
ProxyPath() const

5.313.3.47 const std::string& Arc::UserConfig::ProxyPath ( ) const `[inline]`

Get path to user proxy.

Retrieve path to user proxy.

Returns

Returns the path to the user proxy.

See also

ProxyPath(const std::string&)

5.313.3.48 bool Arc::UserConfig::SaveToFile (const std::string & *filename*) const

Save to INI file.

This method will save the object data as a INI file. The saved file can be loaded with the LoadConfigurationFile method.

Parameters

filename	the name of the file which the data will be saved to.

Returns

`false` if unable to get handle on file, otherwise `true` is returned.

See also

LoadConfigurationFile()

5.313.3.49 void Arc::UserConfig::SetUser (const User & *u*) `[inline]`

Set User for filesystem access.

Sometimes it is desirable to use the identity of another user when accessing the filesystem. This user can be specified through this method. By default this user is the same as the user running the process.

Parameters

u	User identity to use

5.313.3.50 bool Arc::UserConfig::SLCS (const URL & *newSLCS*) `[inline]`

Set the URL to the Short Lived Certificate Service (SLCS).

The attribute associated with this setter method is 'slcs'.

Parameters

newSLCS	is the URL to the SLCS

Returns

This method always returns `true`.

See also

SLCS() const

5.313.3.51 const URL& Arc::UserConfig::SLCS ( ) const `[inline]`

Get the URL to the Short Lived Certificate Service (SLCS).

Returns

The SLCS is returned.

See also

SLCS(const URL&)

5.313.3.52 bool Arc::UserConfig::StoreDirectory (const std::string & *newStoreDirectory*) [inline]

Set store directory.

Sets directory which will be used to store credentials obtained from Short Lived - Credential Servide.

The attribute associated with this setter method is ’storedirectory’.

Parameters

newStore-Directory	is the path to the store directory.

Returns

This method always returns `true`.

See also

5.313.3.53 const std::string& Arc::UserConfig::StoreDirectory ( ) const [inline]

Get store diretory.

Sets directory which is used to store credentials obtained from Short Lived Credential Servide.

Returns

The path to the store directory is returned.

See also

StoreDirectory(const std::string&)

5.313.3.54 bool Arc::UserConfig::Timeout (int *newTimeout*)

Set timeout.

When communicating with a service the timeout specifies how long, in seconds, the communicating instance should wait for a response. If the response have not been recieved before this period in time, the connection is typically dropped, and an error will be reported.

This method will set the timeout to the specified integer. If the passed integer is less than or equal to 0 then `false` is returned and the timeout will not be set, otherwise `true` is returned and the timeout will be set to the new value.

The attribute associated with this setter method is ’timeout’.

Parameters

newTimeout	the new timeout value in seconds.

Returns

`false` in case *newTimeout* <= 0, otherwise `true`.

See also

Timeout() const
DEFAULT_TIMEOUT

5.313.3.55 int Arc::UserConfig::Timeout ( ) const `[inline]`

Get timeout.

Returns the timeout in seconds.

Returns

timeout in seconds.

See also

Timeout(int)
DEFAULT_TIMEOUT

5.313.3.56 bool Arc::UserConfig::UserName (const std::string & *name*) `[inline]`

Set user-name for SLCS.

Set username which is used for requesting credentials from Short Lived Credentials Service.

The attribute associated with this setter method is 'username'.

Parameters

name	is the name of the user.

Returns

This method always return true.

See also

UserName() const

5.313.3.57 const std::string& Arc::UserConfig::UserName ( ) const [inline]

Get user-name.

Get username which is used for requesting credentials from Short Lived Credentials Service.

Returns

The username is returned.

See also

UserName(const std::string&)

5.313.3.58 bool Arc::UserConfig::UtilsDirPath (const std::string & *dir*)

Set path to directory storing utility files for DataPoints.

Some DataPoints can store information on remote services in local files. This method sets the path to the directory containing these files. For example arc∗ tools set it to ARCUSERDIRECTORY and A-REX sets it to the control directory. The directory is created if it does not exist.

Parameters

path	is the new utils dir path.

Returns

This method always returns `true`.

5.313.3.59 const std::string& Arc::UserConfig::UtilsDirPath ( ) const [inline]

Get path to directory storing utility files for DataPoints.

Returns

The utils dir path

See also

UtilsDirPath(const std::string&)

5.313.3.60 bool Arc::UserConfig::Verbosity (const std::string & *newVerbosity*)

Set verbosity.

The verbosity will be set when invoking this method. If the string passed cannot be parsed into a corresponding LogLevel, using the function a ::WARNING is reported and `false` is returned, otherwise `true` is returned.

The attribute associated with this setter method is 'verbosity'.

Returns

`true` in case the verbosity could be set to a allowed LogLevel, otherwise `false`.

See also

Verbosity() const

5.313.3.61 const std::string& Arc::UserConfig::Verbosity ( ) const `[inline]`

Get the user selected level of verbosity.

The string representation of the verbosity level specified by the user is returned when calling this method. If the user have not specified the verbosity level the empty string will be referenced.

Returns

the verbosity level, or empty if it has not been set.

See also

Verbosity(const std::string&)

5.313.3.62 bool Arc::UserConfig::VOMSESPath (const std::string & *path*) `[inline]`

Set path to file containing VOMS configuration.

Set path to file which contians list of VOMS services and associated configuration parameters needed to contact those services. It is used by arcproxy.

The attribute associated with this setter method is 'vomsserverpath'.

Parameters

path	the path to VOMS configuration file

Returns

This method always return true.

See also

VOMSESPath() const

5.313.3.63 const std::string& Arc::UserConfig::VOMSESPath ( )

Get path to file containing VOMS configuration.

Get path to file which contians list of VOMS services and associated configuration parameters.

Returns

The path to VOMS configuration file is returned.

See also

VOMSESPath(const std::string&)

5.313.4 Field Documentation

5.313.4.1 const std::string Arc::UserConfig::ARCUSERDIRECTORY `[static]`

Path to ARC user home directory.

The *ARCUSERDIRECTORY* variable is the path to the ARC home directory of the current user. This path is created using the User::Home() method.

See also

User::Home()

5.313.4.2 const std::string Arc::UserConfig::DEFAULT_BROKER `[static]`

Default broker.

The *DEFAULT_BROKER* specifies the name of the broker which should be used in case no broker is explicitly chosen.

See also

Broker
Broker(const std::string&)
Broker(const std::string&, const std::string&)
Broker() const

5.313.4.3 const int Arc::UserConfig::DEFAULT_TIMEOUT = 20 `[static]`

Default timeout in seconds.

The *DEFAULT_TIMEOUT* specifies interval which will be used in case no timeout interval have been explicitly specified. For a description about timeout see Timeout(int).

See also

Timeout(int)
Timeout() const

5.313.4.4 const std::string Arc::UserConfig::DEFAULTCONFIG `[static]`

Path to default configuration file.

The *DEFAULTCONFIG* variable is the path to the default configuration file used in case no configuration file have been specified. The path is created from the ARCUSERDIRECTORY object.

5.313.4.5 const std::string Arc::UserConfig::EXAMPLECONFIG `[static]`

Path to example configuration.

The *EXAMPLECONFIG* variable is the path to the example configuration file.

5.313.4.6 const std::string Arc::UserConfig::SYSCONFIG `[static]`

Path to system configuration.

The *SYSCONFIG* variable is the path to the system configuration file. This variable is only equal to SYSCONFIGARCLOC if ARC is installed in the root (highly unlikely).

5.313.4.7 const std::string Arc::UserConfig::SYSCONFIGARCLOC `[static]`

Path to system configuration at ARC location.

The *SYSCONFIGARCLOC* variable is the path to the system configuration file which reside at the ARC installation location.

The documentation for this class was generated from the following file:

- UserConfig.h

5.314 Arc::UsernameToken Class Reference

```
#include <UsernameToken.h>
```

Public Types

- enum PasswordType

Public Member Functions

- UsernameToken (SOAPEnvelope &soap)
- UsernameToken (SOAPEnvelope &soap, const std::string &username, const std::string &password, const std::string &uid, PasswordType pwdtype)
- UsernameToken (SOAPEnvelope &soap, const std::string &username, const std::string &id, bool mac, int iteration)
- operator bool (void)
- std::string Username (void)
- bool Authenticate (const std::string &password, std::string &derived_key)
- bool Authenticate (std::istream &password, std::string &derived_key)

5.314.1 Detailed Description

Interface for manipulation of WS-Security according to Username Token Profile.

5.314.2 Member Enumeration Documentation

5.314.2.1 enum **Arc::UsernameToken::PasswordType**

SOAP header element

5.314.3 Constructor & Destructor Documentation

5.314.3.1 Arc::UsernameToken::UsernameToken (SOAPEnvelope & *soap*)

Link to existing SOAP header and parse Username Token information. Username - Token related information is extracted from SOAP header and stored in class variables.

5.314.3.2 Arc::UsernameToken::UsernameToken (SOAPEnvelope & *soap*, const std::string & *username*, const std::string & *password*, const std::string & *uid*, **PasswordType** *pwdtype*)

Add Username Token information into the SOAP header. Generated token contains elements Username and Password and is meant to be used for authentication.

Parameters

soap	the SOAP message
username	<wsse:Username>...</wsse:Username> - if empty it is entered interactively from stdin
password	<wsse:Password Type="...">...</wsse:Password> - if empty it is entered interactively from stdin
uid	<wsse:UsernameToken wsu:ID="...">
pwdtype	<wsse:Password Type="...">...</wsse:Password>

5.314.3.3 Arc::UsernameToken::UsernameToken (SOAPEnvelope & *soap*, const std::string & *username*, const std::string & *id*, bool *mac*, int *iteration*)

Add Username Token information into the SOAP header. Generated token contains elements Username and Salt and is meant to be used for deriving Key Derivation.

Parameters

soap	the SOAP message
username	<wsse:Username>...</wsse:Username>
mac	if derived key is meant to be used for Message Authentication Code
iteration	<wsse11:Iteration>...</wsse11:Iteration>

5.314.4 Member Function Documentation

5.314.4.1 bool Arc::UsernameToken::Authenticate (const std::string & *password*, std::string & *derived_key*)

Checks parsed/generated token against specified password. If token is meant to be used for deriving a key then key is returned in derived_key. In that case authentication is performed outside of UsernameToken class using obtained derived_key.

5.314.4.2 bool Arc::UsernameToken::Authenticate (std::istream & *password*, std::string & *derived_key*)

Checks parsed token against password stored in specified stream. If token is meant to be used for deriving a key then key is returned in derived_key

5.314.4.3 Arc::UsernameToken::operator bool (void)

Returns true of constructor succeeded

5.314.4.4 std::string Arc::UsernameToken::Username (void)

Returns username associated with this instance

The documentation for this class was generated from the following file:

- UsernameToken.h

5.315 Arc::UserSwitch Class Reference

```
#include <User.h>
```

5.315.1 Detailed Description

If this class is created user identity is switched to provided uid and gid. Due to internal lock there will be only one valid instance of this class. Any attempt to create another instance will block till first one is destroyed. If uid and gid are set to 0 then user identity is not switched. But lock is applied anyway. The lock has dual purpose. First and most important is to protect communication with underlying operating system which may depend on user identity. For that it is advisable for code which talks to operating system to acquire valid instance of this class. Care must be taken for not to hold that instance too long cause that may block other code in multithreaded envoronment. Other purpose of this lock is to provide workaround for glibc bug in __nptl_setxid. That bug causes lockup of seteuid() function if racing with fork. To avoid this problem the lock mentioned above is used by Run class while spawning new process.

The documentation for this class was generated from the following file:

- User.h

5.316 Arc::VOMSACInfo Class Reference

The documentation for this class was generated from the following file:

- VOMSUtil.h

5.317 Arc::VOMSTrustList Class Reference

```
#include <VOMSUtil.h>
```

Public Member Functions

- VOMSTrustList (const std::vector< std::string > &encoded_list)
- VOMSTrustList (const std::vector< VOMSTrustChain > &chains, const std::vector< VOMSTrustRegex > &regexs)
- VOMSTrustChain & AddChain (const VOMSTrustChain &chain)
- VOMSTrustChain & AddChain (void)
- RegularExpression & AddRegex (const VOMSTrustRegex &reg)

5.317.1 Detailed Description

Stores definitions for making decision if VOMS server is trusted

5.317.2 Constructor & Destructor Documentation

5.317.2.1 Arc::VOMSTrustList::VOMSTrustList (const std::vector< std::string > & *encoded_list*)

Creates chain lists and regexps from plain list. List is made of chunks delimited by elements containing pattern "NEXT CHAIN". Each chunk with more than one element is converted into one instance of VOMSTrustChain. Chunks with single element are converted to VOMSTrustChain if element does not have special symbols. Otherwise it is treated as regular expression. Those symbols are '^','$' and '*'. Trusted chains can be congicured in two ways: one way is: <tls:VOMSCert-TrustDNChain> <tls:VOMSCertTrustDN>/O=Grid/O=NorduGrid/CN=host/arthur.hep.-lu.se</tls:VOMSCertTrustDN> <tls:VOMSCertTrustDN>/O=Grid/O=NorduGrid/CN=-NorduGrid Certification Authority</tls:VOMSCertTrustDN> <tls:VOMSCertTrustD-N>----NEXT CHAIN---</tls:VOMSCertTrustDN> <tls:VOMSCertTrustDN>/DC=ch/D-C=cern/OU=computers/CN=voms.cern.ch</tls:VOMSCertTrustDN> <tls:VOMSCert-TrustDN>/DC=ch/DC=cern/CN=CERN Trusted Certification Authority</tls:VOMSCert-TrustDN> </tls:VOMSCertTrustDNChain> the other way is: <tls:VOMSCertTrust-DNChain> <tls:VOMSCertTrustDN>/O=Grid/O=NorduGrid/CN=host/arthur.hep.lu.-se</tls:VOMSCertTrustDN> <tls:VOMSCertTrustDN>/O=Grid/O=NorduGrid/CN=-NorduGrid Certification Authority</tls:VOMSCertTrustDN> </tls:VOMSCertTrustDN-Chain> <tls:VOMSCertTrustDNChain> <tls:VOMSCertTrustDN>/DC=ch/DC=cern/-OU=computers/CN=voms.cern.ch</tls:VOMSCertTrustDN> <tls:VOMSCertTrustD-N>/DC=ch/DC=cern/CN=CERN Trusted Certification Authority</tls:VOMSCertTrustD-N> </tls:VOMSCertTrustDNChain> each chunk is supposed to contain a suit of DN of trusted certificate chain, in which the first DN is the DN of the certificate (cert0) which is used to sign the Attribute Certificate (AC), the second DN is the DN of the issuer certificate(cert1) which is used to sign cert0. So if there are one or more intermediate issuers, then there should be 3 or more than 3 DNs in this chunk (considering cert0 and the root certificate, plus the intermediate certificate) .

5.317.2.2 Arc::VOMSTrustList::VOMSTrustList (const std::vector< VOMSTrustChain > & *chains*, const std::vector< VOMSTrustRegex > & *regexs*)

Creates chain lists and regexps from those specified in arguments. See AddChain() and AddRegex() for more information.

5.317.3 Member Function Documentation

5.317.3.1 VOMSTrustChain& Arc::VOMSTrustList::AddChain (const VOMSTrustChain & *chain*)

Adds chain of trusted DNs to list. During verification each signature of AC is checked against all stored chains. DNs of chain of certificate used for signing AC are compared against DNs stored in these chains one by one. If needed DN of issuer of last certificate is checked too. Comparison succeeds if DNs in at least one stored chain are same as those in certificate chain. Comparison stops when all DNs in stored chain are compared. If there are more DNs in stored chain than in certificate chain then comparison fails. - Empty stored list matches any certificate chain. Taking into account that certificate chains are verified down to trusted CA anyway, having more than one DN in stored chain seems to be useless. But such feature may be found useful by some very strict sysadmins. ??? IMO,DN list here is not only for authentication, it is also kind of ACL, which means the AC consumer only trusts those DNs which issues AC.

5.317.3.2 VOMSTrustChain& Arc::VOMSTrustList::AddChain (void)

Adds empty chain of trusted DNs to list.

5.317.3.3 RegularExpression& Arc::VOMSTrustList::AddRegex (const VOMSTrustRegex & *reg*)

Adds regular expression to list. During verification each signature of AC is checked against all stored regular expressions. DN of signing certificate must match at least one of stored regular expressions.

The documentation for this class was generated from the following file:

- VOMSUtil.h

5.318 Arc::WSAEndpointReference Class Reference

```
#include <WSA.h>
```

Public Member Functions

- WSAEndpointReference (XMLNode epr)
- WSAEndpointReference (const WSAEndpointReference &wsa)
- WSAEndpointReference (const std::string &address)
- WSAEndpointReference (void)
- ∼WSAEndpointReference (void)
- std::string Address (void) const
- bool hasAddress (void) const
- void Address (const std::string &uri)
- WSAEndpointReference & operator= (const std::string &address)
- XMLNode ReferenceParameters (void)
- XMLNode MetaData (void)
- operator XMLNode (void)

5.318.1 Detailed Description

Interface for manipulation of WS-Adressing Endpoint Reference.

It works on Endpoint Reference stored in XML tree. No information is stored in this object except reference to corresponding XML subtree.

5.318.2 Constructor & Destructor Documentation

5.318.2.1 Arc::WSAEndpointReference::WSAEndpointReference (XMLNode *epr*)

Link to top level EPR XML node Linking to existing EPR in XML tree

5.318.2.2 Arc::WSAEndpointReference::WSAEndpointReference (const WSAEndpointReference & *wsa*)

Copy constructor

5.318.2.3 Arc::WSAEndpointReference::WSAEndpointReference (const std::string & *address*)

Creating independent EPR - not implemented

5.318.2.4 Arc::WSAEndpointReference::WSAEndpointReference (void)

Dummy constructor - creates invalid instance

5.318.2.5 Arc::WSAEndpointReference::∼WSAEndpointReference (void)

Destructor. All empty elements of EPR XML are destroyed here too

5.318.3 Member Function Documentation

5.318.3.1 std::string Arc::WSAEndpointReference::Address (void) const

Returns Address (URL) encoded in EPR

5.318.3.2 void Arc::WSAEndpointReference::Address (const std::string & *uri*)

Assigns new Address value. If EPR had no Address element it is created.

5.318.3.3 bool Arc::WSAEndpointReference::hasAddress (void) const

Returns true if Address is defined

5.318.3.4 XMLNode Arc::WSAEndpointReference::MetaData (void)

Access to MetaData element of EPR. Obtained XML element should be manipulated directly in application-dependent way. If EPR had no MetaData element it is created.

5.318.3.5 Arc::WSAEndpointReference::operator XMLNode (void)

Returns reference to EPR top XML node

5.318.3.6 WSAEndpointReference& Arc::WSAEndpointReference::operator= (const std::string & *address*)

Same as Address(uri)

5.318.3.7 XMLNode Arc::WSAEndpointReference::ReferenceParameters (void)

Access to ReferenceParameters element of EPR. Obtained XML element should be manipulated directly in application-dependent way. If EPR had no ReferenceParameters element it is created.

The documentation for this class was generated from the following file:

- WSA.h

5.319 Arc::WSAHeader Class Reference

```
#include <WSA.h>
```

Public Member Functions

- WSAHeader (SOAPEnvelope &soap)
- WSAHeader (const std::string &action)
- std::string To (void) const
- bool hasTo (void) const
- void To (const std::string &uri)
- WSAEndpointReference From (void)
- WSAEndpointReference ReplyTo (void)
- WSAEndpointReference FaultTo (void)
- std::string Action (void) const
- bool hasAction (void) const
- void Action (const std::string &uri)
- std::string MessageID (void) const
- bool hasMessageID (void) const
- void MessageID (const std::string &uri)

- std::string RelatesTo (void) const
- bool hasRelatesTo (void) const
- void RelatesTo (const std::string &uri)
- std::string RelationshipType (void) const
- bool hasRelationshipType (void) const
- void RelationshipType (const std::string &uri)
- XMLNode ReferenceParameter (int n)
- XMLNode ReferenceParameter (const std::string &name)
- XMLNode NewReferenceParameter (const std::string &name)
- operator XMLNode (void)

Static Public Member Functions

- static bool Check (SOAPEnvelope &soap)

Protected Attributes

- bool header_allocated_

5.319.1 Detailed Description

Interface for manipulation WS-Addressing information in SOAP header.

It works on Endpoint Reference stored in XML tree. No information is stored in this object except reference to corresponding XML subtree.

5.319.2 Constructor & Destructor Documentation

5.319.2.1 Arc::WSAHeader::WSAHeader (SOAPEnvelope & *soap*)

Linking to a header of existing SOAP message

5.319.2.2 Arc::WSAHeader::WSAHeader (const std::string & *action*)

Creating independent SOAP header - not implemented

5.319.3 Member Function Documentation

5.319.3.1 std::string Arc::WSAHeader::Action (void) const

Returns content of Action element of SOAP Header.

5.319.3.2 void Arc::WSAHeader::Action (const std::string & *uri*)

Set content of Action element of SOAP Header. If such element does not exist it's created.

5.319.3.3 static bool Arc::WSAHeader::Check (SOAPEnvelope & *soap*) [static]

Tells if specified SOAP message has WSA header

5.319.3.4 WSAEndpointReference Arc::WSAHeader::FaultTo (void)

Returns FaultTo element of SOAP Header. If such element does not exist it's created. Obtained element may be manipulted.

5.319.3.5 WSAEndpointReference Arc::WSAHeader::From (void)

Returns From element of SOAP Header. If such element does not exist it's created. Obtained element may be manipulted.

5.319.3.6 bool Arc::WSAHeader::hasAction (void) const

Returns true if Action element is defined.

5.319.3.7 bool Arc::WSAHeader::hasMessageID (void) const

Returns true if MessageID element is defined.

5.319.3.8 bool Arc::WSAHeader::hasRelatesTo (void) const

Returns true if RelatesTo element is defined.

5.319.3.9 bool Arc::WSAHeader::hasRelationshipType (void) const

Returns true if RelationshipType element is defined.

5.319.3.10 bool Arc::WSAHeader::hasTo (void) const

Returns true if To element is defined.

5.319.3.11 std::string Arc::WSAHeader::MessageID (void) const

Returns content of MessageID element of SOAP Header.

5.319.3.12 void Arc::WSAHeader::MessageID (const std::string & *uri*)

Set content of MessageID element of SOAP Header. If such element does not exist it's created.

5.319.3.13 XMLNode Arc::WSAHeader::NewReferenceParameter (const std::string & *name*)

Creates new ReferenceParameter element with specified name. Returns reference to created element.

5.319.3.14 Arc::WSAHeader::operator XMLNode (void)

Returns reference to SOAP Header - not implemented

5.319.3.15 XMLNode Arc::WSAHeader::ReferenceParameter (int *n*)

Return n-th ReferenceParameter element

5.319.3.16 XMLNode Arc::WSAHeader::ReferenceParameter (const std::string & *name*)

Returns first ReferenceParameter element with specified name

5.319.3.17 std::string Arc::WSAHeader::RelatesTo (void) const

Returns content of RelatesTo element of SOAP Header.

5.319.3.18 void Arc::WSAHeader::RelatesTo (const std::string & *uri*)

Set content of RelatesTo element of SOAP Header. If such element does not exist it's created.

5.319.3.19 std::string Arc::WSAHeader::RelationshipType (void) const

Returns content of RelationshipType element of SOAP Header.

5.319.3.20 void Arc::WSAHeader::RelationshipType (const std::string & *uri*)

Set content of RelationshipType element of SOAP Header. If such element does not exist it's created.

5.319.3.21 WSAEndpointReference Arc::WSAHeader::ReplyTo (void)

Returns ReplyTo element of SOAP Header. If such element does not exist it's created. Obtained element may be manipulted.

5.319.3.22 std::string Arc::WSAHeader::To (void) const

Returns content of To element of SOAP Header.

5.319.3.23 void Arc::WSAHeader::To (const std::string & *uri*)

Set content of To element of SOAP Header. If such element does not exist it's created.

5.319.4 Field Documentation

5.319.4.1 bool Arc::WSAHeader::header_allocated_ `[protected]`

SOAP header element

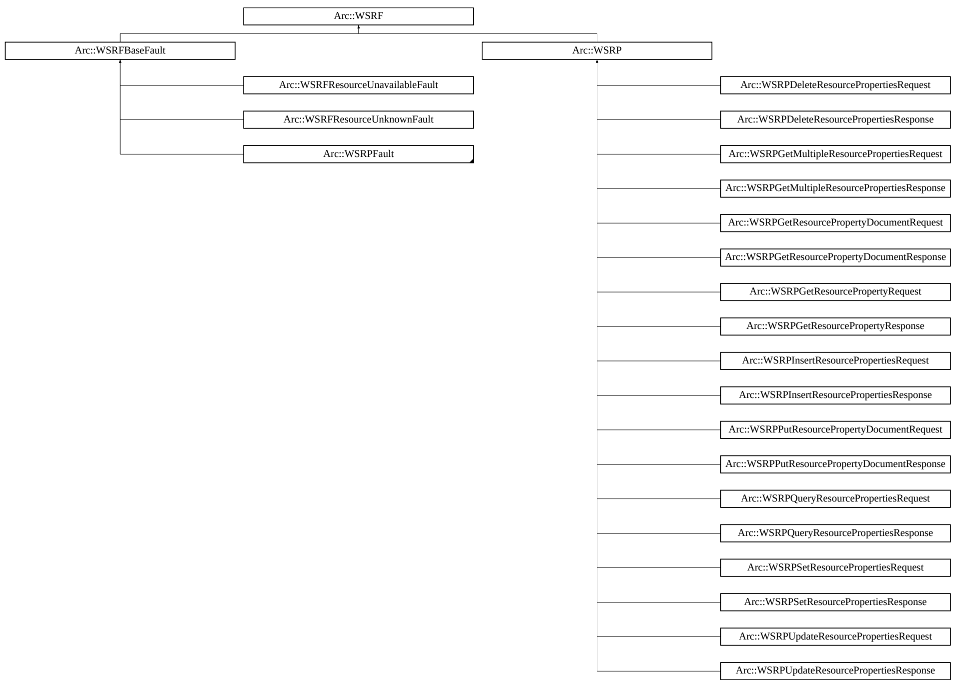
The documentation for this class was generated from the following file:

- WSA.h

5.320 Arc::WSRF Class Reference

`#include <WSRF.h>`

Inheritance diagram for Arc::WSRF:


Arc::WSRF
Arc::WSRFBaseFault
Arc::WSRP
Arc::WSRFResourceUnavailableFault
Arc::WSRFResourceUnknownFault
Arc::WSRPFault
Arc::WSRPDeleteResourcePropertiesRequest
Arc::WSRPDeleteResourcePropertiesResponse
Arc::WSRPGetMultipleResourcePropertiesRequest
Arc::WSRPGetMultipleResourcePropertiesResponse
Arc::WSRPGetResourcePropertyDocumentRequest
Arc::WSRPGetResourcePropertyDocumentResponse
Arc::WSRPGetResourcePropertyRequest
Arc::WSRPGetResourcePropertyResponse
Arc::WSRPInsertResourcePropertiesRequest
Arc::WSRPInsertResourcePropertiesResponse
Arc::WSRPPutResourcePropertyDocumentRequest
Arc::WSRPPutResourcePropertyDocumentResponse
Arc::WSRPQueryResourcePropertiesRequest
Arc::WSRPQueryResourcePropertiesResponse
Arc::WSRPSetResourcePropertiesRequest
Arc::WSRPSetResourcePropertiesResponse
Arc::WSRPUpdateResourcePropertiesRequest
Arc::WSRPUpdateResourcePropertiesResponse

Public Member Functions

- WSRF (SOAPEnvelope &soap, const std::string &action="")
- WSRF (bool fault=false, const std::string &action="")
- virtual SOAPEnvelope & SOAP (void)
- virtual operator bool (void)

Protected Member Functions

- void set_namespaces (void)

Protected Attributes

- bool allocated_
- bool valid_

5.320.1 Detailed Description

Base class for every WSRF message.

This class is not intended to be used directly. Use it like reference while passing through unknown WSRF message or use classes derived from it.

5.320.2 Constructor & Destructor Documentation

5.320.2.1 Arc::WSRF::WSRF (SOAPEnvelope & *soap*, const std::string & *action* = "")

Constructor - creates object out of supplied SOAP tree.

5.320.2.2 Arc::WSRF::WSRF (bool *fault* = `false`, const std::string & *action* = "")

Constructor - creates new WSRF object

5.320.3 Member Function Documentation

5.320.3.1 virtual Arc::WSRF::operator bool (void) `[inline, virtual]`

Returns true if instance is valid

References valid_.

5.320.3.2 void Arc::WSRF::set_namespaces (void) `[protected]`

true if object represents valid WSRF message set WS Resource namespaces and default prefixes in SOAP message

Reimplemented in Arc::WSRP, and Arc::WSRFBaseFault.

5.320.3.3 virtual SOAPEnvelope& Arc::WSRF::SOAP (void) `[inline, virtual]`

Direct access to underlying SOAP element

5.320.4 Field Documentation

5.320.4.1 bool **Arc::WSRF::allocated_** `[protected]`

Associated SOAP message - it's SOAP message after all

5.320.4.2 bool **Arc::WSRF::valid_** `[protected]`

true if soap_ needs to be deleted in destructor

Referenced by operator bool().

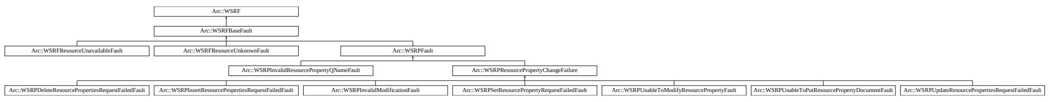
The documentation for this class was generated from the following file:

- WSRF.h

5.321 Arc::WSRFBaseFault Class Reference

`#include <WSRFBaseFault.h>`

Inheritance diagram for Arc::WSRFBaseFault:


Arc::WSRF
Arc::WSRFBaseFault
Arc::WSRFResourceUnavailableFault
Arc::WSRFResourceUnknownFault
Arc::WSRPFault
Arc::WSRPInvalidResourcePropertyQNameFault
Arc::WSRPResourcePropertyChangeFailure
Arc::WSRPDeleteResourcePropertiesRequestFailedFault
Arc::WSRPInsertResourcePropertiesRequestFailedFault
Arc::WSRPInvalidModificationFault
Arc::WSRPSetResourcePropertyRequestFailedFault
Arc::WSRPUnableToModifyResourcePropertyFault
Arc::WSRPUnableToPutResourcePropertyDocumentFault
Arc::WSRPUpdateResourcePropertiesRequestFailedFault

Public Member Functions

- WSRFBaseFault (SOAPEnvelope &soap)
- WSRFBaseFault (const std::string &type)

Protected Member Functions

- void set_namespaces (void)

5.321.1 Detailed Description

Base class for WSRF fault messages.

Use classes inherited from it for specific faults.

5.321.2 Constructor & Destructor Documentation

5.321.2.1 Arc::WSRFBaseFault::WSRFBaseFault (SOAPEnvelope & *soap*)

Constructor - creates object out of supplied SOAP tree.

5.321.2.2 Arc::WSRFBaseFault::WSRFBaseFault (const std::string & *type*)

Constructor - creates new WSRF fault

5.321.3 Member Function Documentation

5.321.3.1 void Arc::WSRFBaseFault::set_namespaces (void) `[protected]`

set WS-ResourceProperties namespaces and default prefixes in SOAP message

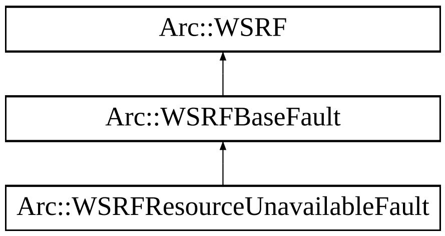
Reimplemented from Arc::WSRF.

The documentation for this class was generated from the following file:

- WSRFBaseFault.h

5.322 Arc::WSRFResourceUnavailableFault Class Reference

Inheritance diagram for Arc::WSRFResourceUnavailableFault:

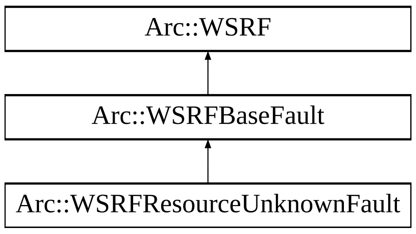


The documentation for this class was generated from the following file:

- WSRFBaseFault.h

5.323 Arc::WSRFResourceUnknownFault Class Reference

Inheritance diagram for Arc::WSRFResourceUnknownFault:



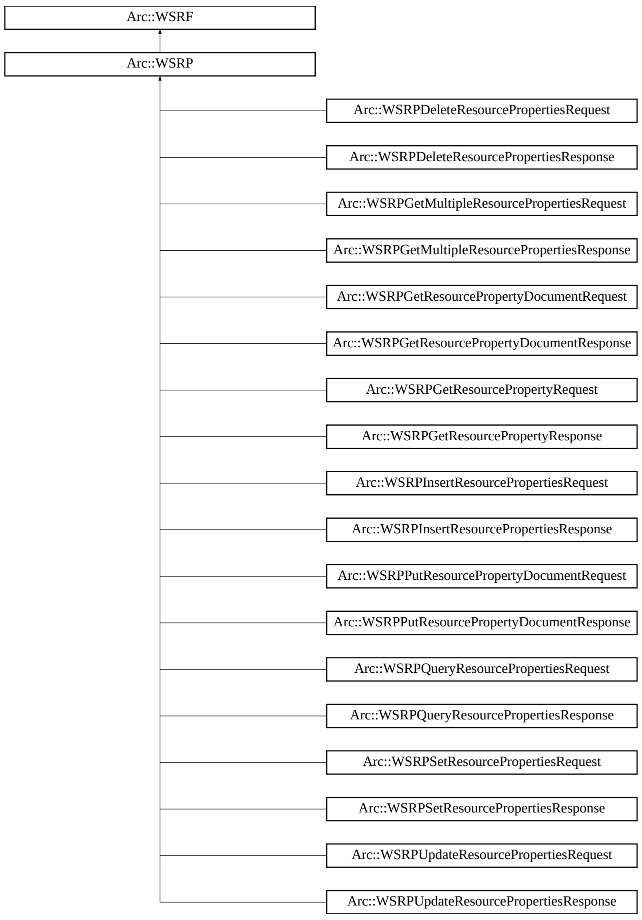
The documentation for this class was generated from the following file:

- WSRFBaseFault.h

5.324 Arc::WSRP Class Reference

`#include <WSResourceProperties.h>`

Inheritance diagram for Arc::WSRP:


Arc::WSRF
Arc::WSRP
Arc::WSRPDeleteResourcePropertiesRequest
Arc::WSRPDeleteResourcePropertiesResponse
Arc::WSRPGetMultipleResourcePropertiesRequest
Arc::WSRPGetMultipleResourcePropertiesResponse
Arc::WSRPGetResourcePropertyDocumentRequest
Arc::WSRPGetResourcePropertyDocumentResponse
Arc::WSRPGetResourcePropertyRequest
Arc::WSRPGetResourcePropertyResponse
Arc::WSRPInsertResourcePropertiesRequest
Arc::WSRPInsertResourcePropertiesResponse
Arc::WSRPPutResourcePropertyDocumentRequest
Arc::WSRPPutResourcePropertyDocumentResponse
Arc::WSRPQueryResourcePropertiesRequest
Arc::WSRPQueryResourcePropertiesResponse
Arc::WSRPSetResourcePropertiesRequest
Arc::WSRPSetResourcePropertiesResponse
Arc::WSRPUpdateResourcePropertiesRequest
Arc::WSRPUpdateResourcePropertiesResponse

Public Member Functions

- WSRP (bool fault=false, const std::string &action="")
- WSRP (SOAPEnvelope &soap, const std::string &action="")

Protected Member Functions

- void set_namespaces (void)

5.324.1 Detailed Description

Base class for WS-ResourceProperties structures.

Inheriting classes implement specific WS-ResourceProperties messages and their properties/elements. Refer to WS-ResourceProperties specifications for things specific to every message.

5.324.2 Constructor & Destructor Documentation

5.324.2.1 Arc::WSRP::WSRP (bool *fault* = `false`, const std::string & *action* = "")

Constructor - prepares object for creation of new WSRP request/response/fault

5.324.2.2 Arc::WSRP::WSRP (SOAPEnvelope & *soap*, const std::string & *action* = "")

Constructor - creates object out of supplied SOAP tree. It does not check if 'soap' represents valid WS-ResourceProperties structure. Actual check for validity of structure has to be done by derived class.

5.324.3 Member Function Documentation

5.324.3.1 void Arc::WSRP::set_namespaces (void) `[protected]`

set WS-ResourceProperties namespaces and default prefixes in SOAP message

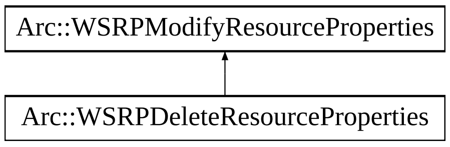
Reimplemented from Arc::WSRF.

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.325 Arc::WSRPDeleteResourceProperties Class Reference

Inheritance diagram for Arc::WSRPDeleteResourceProperties:

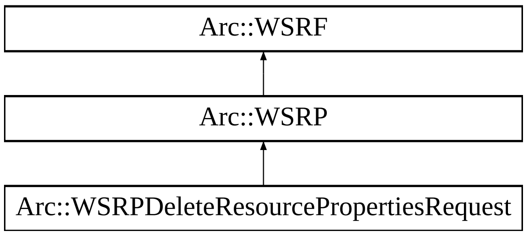

Arc::WSRPModifyResourceProperties
Arc::WSRPDeleteResourceProperties

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.326 Arc::WSRPDeleteResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPDeleteResourcePropertiesRequest:

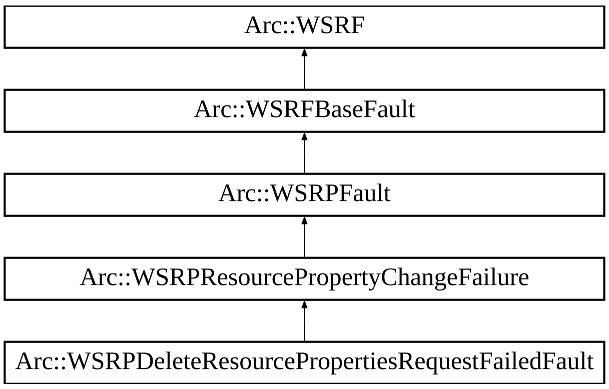


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.327 Arc::WSRPDeleteResourcePropertiesRequestFailedFault - Class Reference

Inheritance diagram for Arc::WSRPDeleteResourcePropertiesRequestFailedFault:

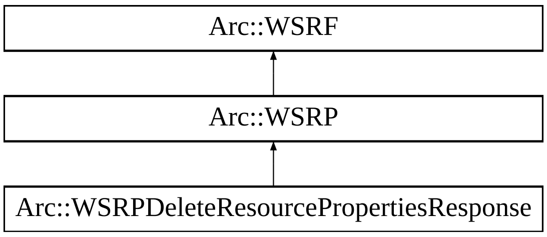

Arc::WSRF
Arc::WSRFBaseFault
Arc::WSRPFault
Arc::WSRPResourcePropertyChangeFailure
Arc::WSRPDeleteResourcePropertiesRequestFailedFault

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.328 Arc::WSRPDeleteResourcePropertiesResponse Class - Reference

Inheritance diagram for Arc::WSRPDeleteResourcePropertiesResponse:



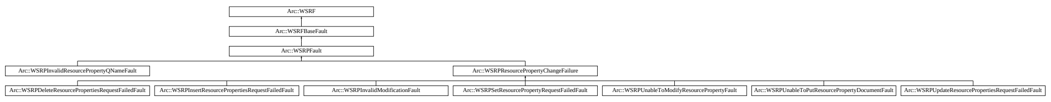
The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.329 Arc::WSRPFault Class Reference

```
#include <WSResourceProperties.h>
```

Inheritance diagram for Arc::WSRPFault:


Arc::WSRF
Arc::WSRFBaseFault
Arc::WSRPFault
Arc::WSRPInvalidResourcePropertyQNameFault
Arc::WSRPResourcePropertyChangeFailure
Arc::WSRPDeleteResourcePropertiesRequestFailedFault
Arc::WSRPInsertResourcePropertiesRequestFailedFault
Arc::WSRPInvalidModificationFault
Arc::WSRPSetResourcePropertyRequestFailedFault
Arc::WSRPUnableToModifyResourcePropertyFault
Arc::WSRPUnableToPutResourcePropertyDocumentFault
Arc::WSRPUpdateResourcePropertiesRequestFailedFault

Public Member Functions

- WSRPFault (SOAPEnvelope &soap)
- WSRPFault (const std::string &type)

5.329.1 Detailed Description

Base class for WS-ResourceProperties faults.

5.329.2 Constructor & Destructor Documentation

5.329.2.1 Arc::WSRPFault::WSRPFault (SOAPEnvelope & *soap*)

Constructor - creates object out of supplied SOAP tree.

5.329.2.2 Arc::WSRPFault::WSRPFault (const std::string & *type*)

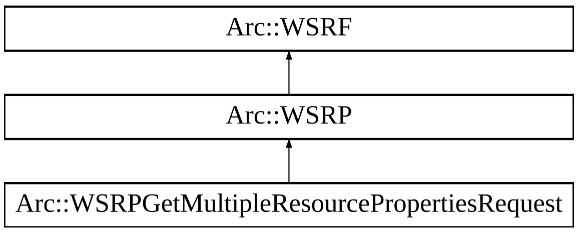
Constructor - creates new WSRP fault

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.330 Arc::WSRPGetMultipleResourcePropertiesRequest Class - Reference

Inheritance diagram for Arc::WSRPGetMultipleResourcePropertiesRequest:

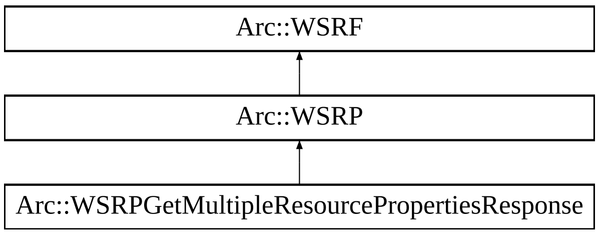


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.331 Arc::WSRPGetMultipleResourcePropertiesResponse Class - Reference

Inheritance diagram for Arc::WSRPGetMultipleResourcePropertiesResponse:

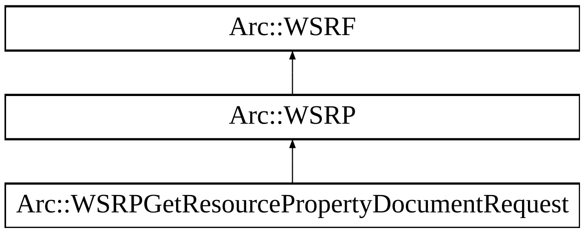


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.332 Arc::WSRPGetResourcePropertyDocumentRequest Class Reference

Inheritance diagram for Arc::WSRPGetResourcePropertyDocumentRequest:

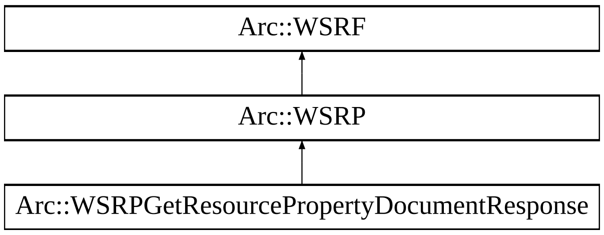


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.333 Arc::WSRPGetResourcePropertyDocumentResponse Class Reference

Inheritance diagram for Arc::WSRPGetResourcePropertyDocumentResponse:

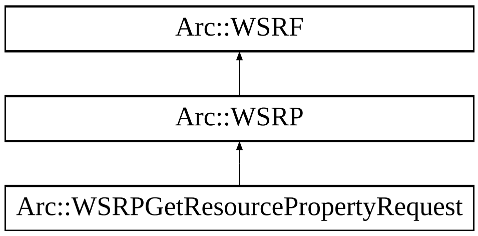


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.334 Arc::WSRPGetResourcePropertyRequest Class Reference

Inheritance diagram for Arc::WSRPGetResourcePropertyRequest:

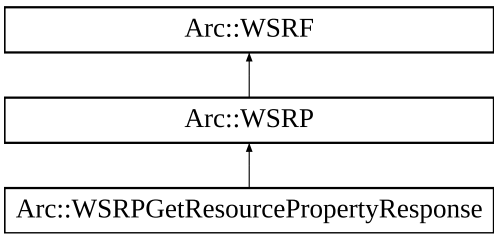


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.335 Arc::WSRPGetResourcePropertyResponse Class Reference

Inheritance diagram for Arc::WSRPGetResourcePropertyResponse:

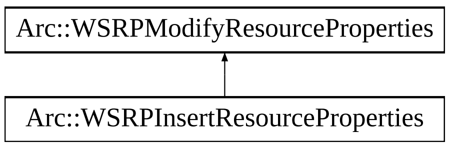


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.336 Arc::WSRPInsertResourceProperties Class Reference

Inheritance diagram for Arc::WSRPInsertResourceProperties:

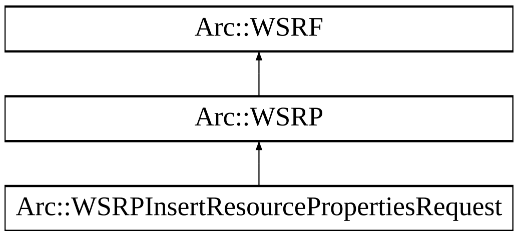

Arc::WSRPModifyResourceProperties
Arc::WSRPInsertResourceProperties

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.337 Arc::WSRPInsertResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPInsertResourcePropertiesRequest:

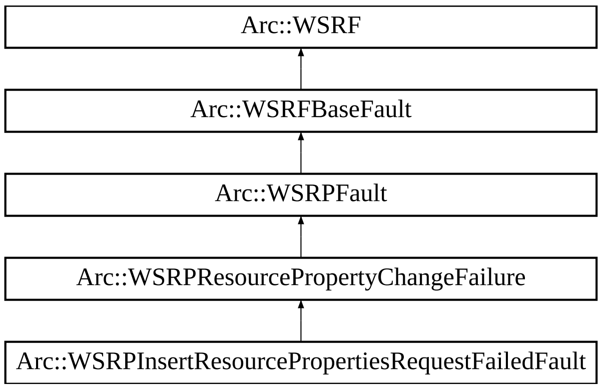


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.338 Arc::WSRPInsertResourcePropertiesRequestFailedFault - Class Reference

Inheritance diagram for Arc::WSRPInsertResourcePropertiesRequestFailedFault:

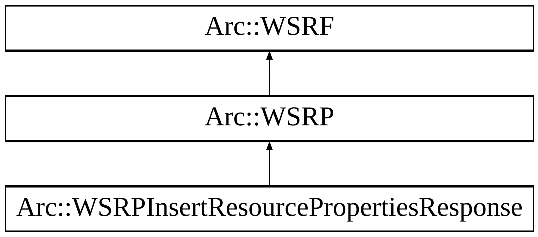

Arc::WSRF
Arc::WSRFBaseFault
Arc::WSRPFault
Arc::WSRPResourcePropertyChangeFailure
Arc::WSRPInsertResourcePropertiesRequestFailedFault

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.339 Arc::WSRPInsertResourcePropertiesResponse Class - Reference

Inheritance diagram for Arc::WSRPInsertResourcePropertiesResponse:

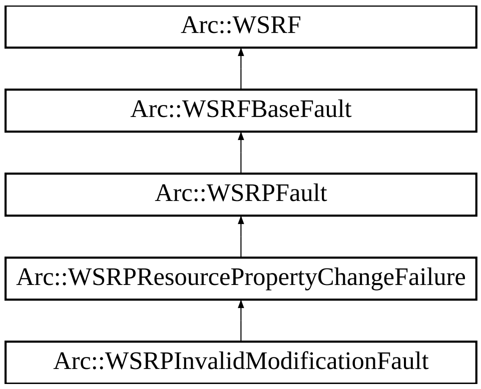


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.340 Arc::WSRPInvalidModificationFault Class Reference

Inheritance diagram for Arc::WSRPInvalidModificationFault:

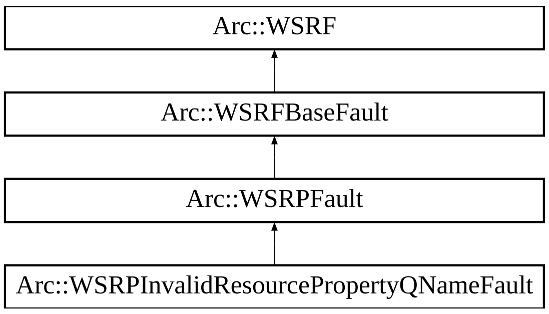

Arc::WSRF
Arc::WSRFBaseFault
Arc::WSRPFault
Arc::WSRPResourcePropertyChangeFailure
Arc::WSRPInvalidModificationFault

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.341 Arc::WSRPInvalidResourcePropertyQNameFault Class - Reference

Inheritance diagram for Arc::WSRPInvalidResourcePropertyQNameFault:

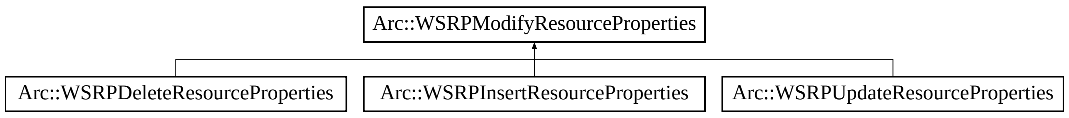


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.342 Arc::WSRPModifyResourceProperties Class Reference

Inheritance diagram for Arc::WSRPModifyResourceProperties:

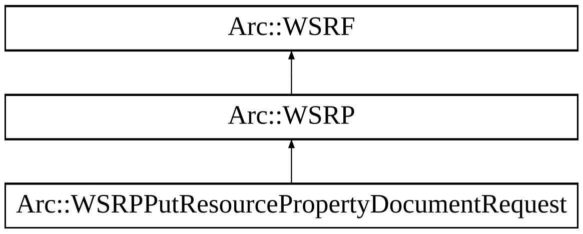

Arc::WSRPModifyResourceProperties
Arc::WSRPDeleteResourceProperties
Arc::WSRPInsertResourceProperties
Arc::WSRPUpdateResourceProperties

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.343 Arc::WSRPPutResourcePropertyDocumentRequest Class Reference

Inheritance diagram for Arc::WSRPPutResourcePropertyDocumentRequest:

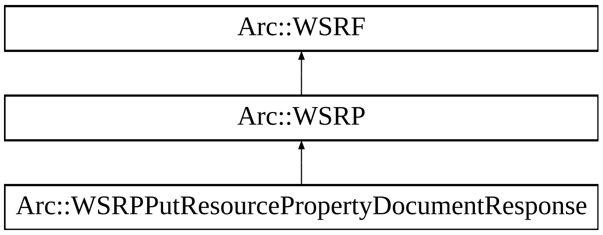


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.344 Arc::WSRPPutResourcePropertyDocumentResponse Class Reference

Inheritance diagram for Arc::WSRPPutResourcePropertyDocumentResponse:

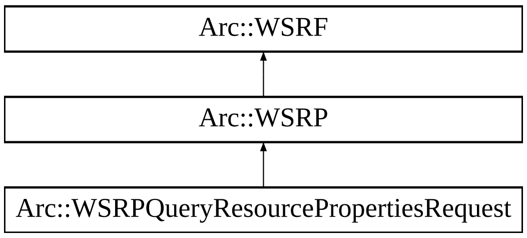


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.345 Arc::WSRPQueryResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPQueryResourcePropertiesRequest:

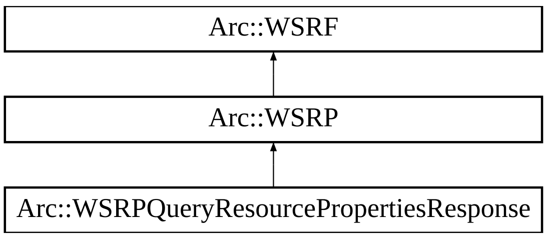


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.346 Arc::WSRPQueryResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPQueryResourcePropertiesResponse:



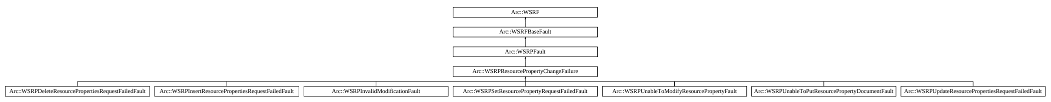
The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.347 Arc::WSRPResourcePropertyChangeFailure Class Reference

```
#include <WSResourceProperties.h>
```

Inheritance diagram for Arc::WSRPResourcePropertyChangeFailure:


Arc::WSRF
Arc::WSRFBaseFault
Arc::WSRPFault
Arc::WSRPResourcePropertyChangeFailure
Arc::WSRPDeleteResourcePropertiesRequestFailedFault
Arc::WSRPInsertResourcePropertiesRequestFailedFault
Arc::WSRPInvalidModificationFault
Arc::WSRPSetResourcePropertyRequestFailedFault
Arc::WSRPUnableToModifyResourcePropertyFault
Arc::WSRPUnableToPutResourcePropertyDocumentFault
Arc::WSRPUpdateResourcePropertiesRequestFailedFault

Public Member Functions

- WSRPResourcePropertyChangeFailure (SOAPEnvelope &soap)
- WSRPResourcePropertyChangeFailure (const std::string &type)

5.347.1 Detailed Description

Base class for WS-ResourceProperties faults which contain ResourcePropertyChange-Failure

5.347.2 Constructor & Destructor Documentation

5.347.2.1 Arc::WSRPResourcePropertyChangeFailure::WSRPResourcePropertyChangeFailure (SOAPEnvelope & *soap*) [inline]

Constructor - creates object out of supplied SOAP tree.

5.347.2.2 Arc::WSRPResourcePropertyChangeFailure::WSRPResourcePropertyChangeFailure (const std::string & *type*) [inline]

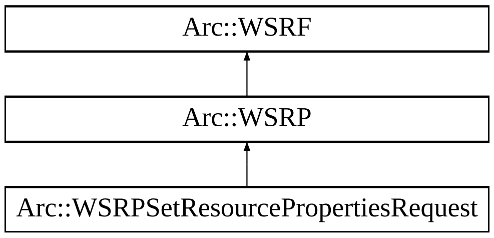
Constructor - creates new WSRP fault

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.348 Arc::WSRPSetResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPSetResourcePropertiesRequest:

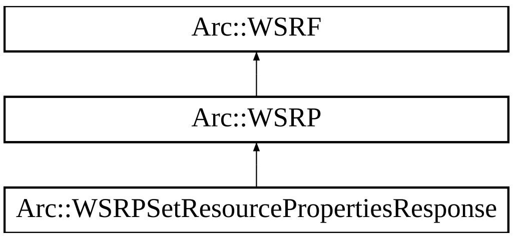


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.349 Arc::WSRPSetResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPSetResourcePropertiesResponse:

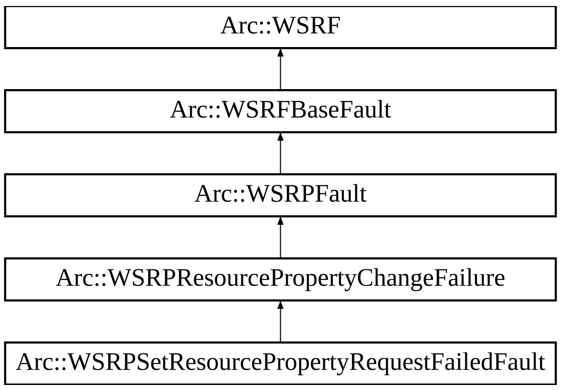


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.350 Arc::WSRPSetResourcePropertyRequestFailedFault Class - Reference

Inheritance diagram for Arc::WSRPSetResourcePropertyRequestFailedFault:

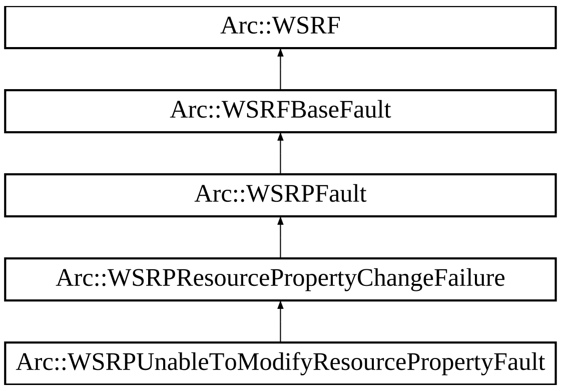

Arc::WSRF
Arc::WSRFBaseFault
Arc::WSRPFault
Arc::WSRPResourcePropertyChangeFailure
Arc::WSRPSetResourcePropertyRequestFailedFault

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.351 Arc::WSRPUnableToModifyResourcePropertyFault Class - Reference

Inheritance diagram for Arc::WSRPUnableToModifyResourcePropertyFault:

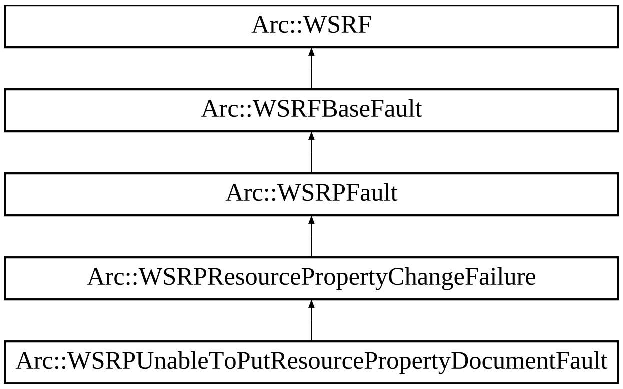

Arc::WSRF
Arc::WSRFBaseFault
Arc::WSRPFault
Arc::WSRPResourcePropertyChangeFailure
Arc::WSRPUnableToModifyResourcePropertyFault

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.352 Arc::WSRPUnableToPutResourcePropertyDocumentFault - Class Reference

Inheritance diagram for Arc::WSRPUnableToPutResourcePropertyDocumentFault:

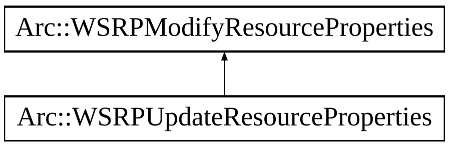

Arc::WSRF
Arc::WSRFBaseFault
Arc::WSRPFault
Arc::WSRPResourcePropertyChangeFailure
Arc::WSRPUnableToPutResourcePropertyDocumentFault

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.353 Arc::WSRPUpdateResourceProperties Class Reference

Inheritance diagram for Arc::WSRPUpdateResourceProperties:

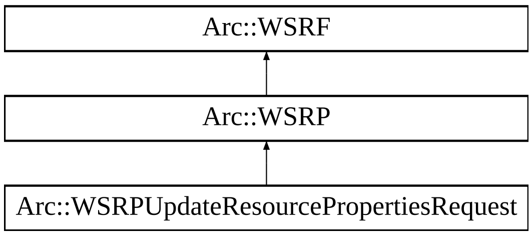

Arc::WSRPModifyResourceProperties
Arc::WSRPUpdateResourceProperties

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.354 Arc::WSRPUpdateResourcePropertiesRequest Class - Reference

Inheritance diagram for Arc::WSRPUpdateResourcePropertiesRequest:

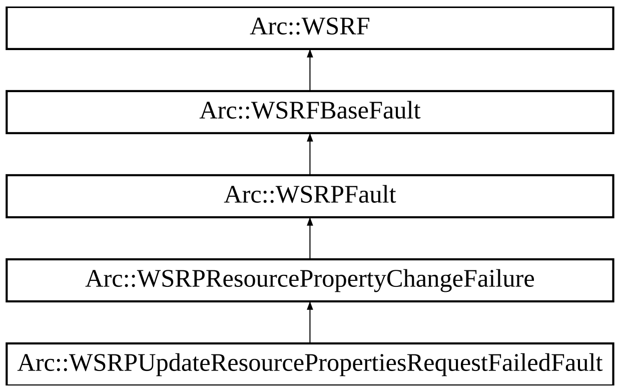


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.355 Arc::WSRPUpdateResourcePropertiesRequestFailedFault - Class Reference

Inheritance diagram for Arc::WSRPUpdateResourcePropertiesRequestFailedFault:

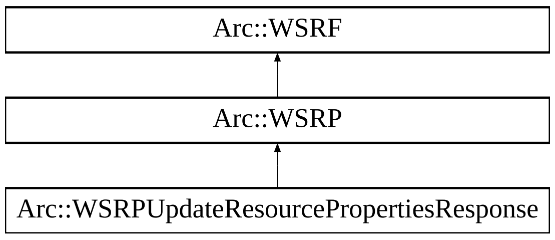

Arc::WSRF
Arc::WSRFBaseFault
Arc::WSRPFault
Arc::WSRPResourcePropertyChangeFailure
Arc::WSRPUpdateResourcePropertiesRequestFailedFault

The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.356 Arc::WSRPUpdateResourcePropertiesResponse Class - Reference

Inheritance diagram for Arc::WSRPUpdateResourcePropertiesResponse:

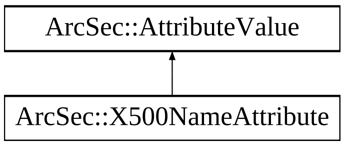


The documentation for this class was generated from the following file:

- WSResourceProperties.h

5.357 ArcSec::X500NameAttribute Class Reference

Inheritance diagram for ArcSec::X500NameAttribute:



Public Member Functions

- virtual bool equal (AttributeValue ∗other, bool check_id=true)
- virtual std::string encode ()
- virtual std::string getType ()
- virtual std::string getId ()

5.357.1 Member Function Documentation

5.357.1.1 virtual std::string ArcSec::X500NameAttribute::encode ( ) [inline, virtual]

encode the value in a string format

Implements ArcSec::AttributeValue.

5.357.1.2 virtual bool ArcSec::X500NameAttribute::equal (AttributeValue ∗ *value*, bool *check_id* = true) [virtual]

Evluate whether "this" equale to the parameter value

Implements ArcSec::AttributeValue.

5.357.1.3 virtual std::string ArcSec::X500NameAttribute::getId ( ) [inline, virtual]

Get the AttributeId of the <Attribute>

Implements ArcSec::AttributeValue.

5.357.1.4 virtual std::string ArcSec::X500NameAttribute::getType ( ) [inline, virtual]

Get the DataType of the <Attribute>

Implements ArcSec::AttributeValue.

The documentation for this class was generated from the following file:

- X500NameAttribute.h

5.358 Arc::X509Token Class Reference

```
#include <X509Token.h>
```

Public Types

- enum X509TokenType

Public Member Functions

- X509Token (SOAPEnvelope &soap, const std::string &keyfile="")
- X509Token (SOAPEnvelope &soap, const std::string &certfile, const std::string &keyfile, X509TokenType token_type=Signature)
- ∼X509Token (void)
- operator bool (void)
- bool Authenticate (const std::string &cafile, const std::string &capath)
- bool Authenticate (void)

5.358.1 Detailed Description

Class for manipulating X.509 Token Profile.

This class is for generating/consuming X.509 Token profile. Currently it is used by x509token handler (src/hed/pdc/x509tokensh/) It is not necessary to directly called this class. If we need to use X.509 Token functionality, we only need to configure the x509token handler into service and client.

5.358.2 Member Enumeration Documentation

5.358.2.1 enum Arc::X509Token::X509TokenType

X509TokeType is for distinguishing two types of operation. It is used as the parameter of constuctor.

5.358.3 Constructor & Destructor Documentation

5.358.3.1 Arc::X509Token::X509Token (SOAPEnvelope & *soap*, const std::string & *keyfile* = " ")

Constructor.Parse X509 Token information from SOAP header. X509 Token related information is extracted from SOAP header and stored in class variables. And then it the X509Token object will be used for authentication if the tokentype is Signature; otherwise if the tokentype is Encryption, the encrypted soap body will be decrypted and replaced by decrypted message. keyfile is only needed when the X509Token is encryption token

5.358.3.2 Arc::X509Token::X509Token (SOAPEnvelope & *soap*, const std::string & *certfile*, const std::string & *keyfile*, X509TokenType *token_type* = `Signature`)

Constructor. Add X509 Token information into the SOAP header. Generated token contains elements X509 token and signature, and is meant to be used for authentication on the consuming side.

Parameters

soap	The SOAP message to which the X509 Token will be inserted
certfile	The certificate file which will be used to encrypt the SOAP body (if parameter tokentype is Encryption), or be used as <wsse:BinarySecurityToken/> (if parameter tokentype is Signature).
keyfile	The key file which will be used to create signature. Not needed when create encryption.
tokentype	Token type: Signature or Encryption.

5.358.3.3 Arc::X509Token::∼X509Token (void)

Deconstructor. Nothing to be done except finalizing the xmlsec library.

5.358.4 Member Function Documentation

5.358.4.1 bool Arc::X509Token::Authenticate (const std::string & *cafile*, const std::string & *capath*)

Check signature by using the certificare information in X509Token which is parsed by the constructor, and the trusted certificates specified as one of the two parameters. Not only the signature (in the X509Token) itself is checked, but also the certificate which is supposed to check the signature needs to be trused (which means the certificate is issued by the ca certificate from CA file or CA directory). At least one the the two parameters should be set.

Parameters

cafile	The CA file
capath	The CA directory

Returns

true if authentication passes; otherwise false

5.358.4.2 bool Arc::X509Token::Authenticate (void)

Check signature by using the cert information in soap message. Only the signature itself is checked, and it is not guranteed that the certificate which is supposed to check the signature is trusted.

5.358.4.3 Arc::X509Token::operator bool (void)

Returns true of constructor succeeded

The documentation for this class was generated from the following file:

- X509Token.h

5.359 Arc::XmlContainer Class Reference

The documentation for this class was generated from the following file:

- XmlContainer.h

5.360 Arc::XmlDatabase Class Reference

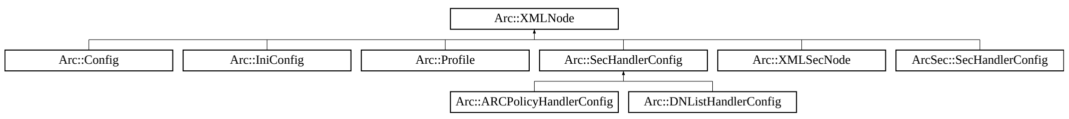
The documentation for this class was generated from the following file:

- XmlDatabase.h

5.361 Arc::XMLNode Class Reference

```
#include <XMLNode.h>
```

Inheritance diagram for Arc::XMLNode:



Public Member Functions

- XMLNode (void)
- XMLNode (const XMLNode &node)
- XMLNode (const std::string &xml)
- XMLNode (const char ∗xml, int len=-1)
- XMLNode (long ptr_addr)
- XMLNode (const NS &ns, const char ∗name)
- ∼XMLNode (void)
- void New (XMLNode &node) const
- void Exchange (XMLNode &node)
- void Move (XMLNode &node)
- void Swap (XMLNode &node)
- operator bool (void) const
- bool operator! (void) const
- bool operator== (const XMLNode &node)
- bool operator!= (const XMLNode &node)
- bool Same (const XMLNode &node)
- bool operator== (bool val)
- bool operator!= (bool val)
- bool operator== (const std::string &str)
- bool operator!= (const std::string &str)
- bool operator== (const char ∗str)
- bool operator!= (const char ∗str)
- XMLNode Child (int n=0)
- XMLNode operator[] (const char ∗name) const
- XMLNode operator[] (const std::string &name) const
- XMLNode operator[] (int n) const
- void operator++ (void)
- void operator-- (void)
- int Size (void) const
- XMLNode Get (const std::string &name) const
- std::string Name (void) const
- std::string Prefix (void) const
- std::string FullName (void) const
- std::string Namespace (void) const
- void Name (const char ∗name)
- void Name (const std::string &name)
- void GetXML (std::string &out_xml_str, bool user_friendly=false) const
- void GetXML (std::string &out_xml_str, const std::string &encoding, bool user_-friendly=false) const
- void GetDoc (std::string &out_xml_str, bool user_friendly=false) const
- operator std::string (void) const
- XMLNode & operator= (const char ∗content)
- XMLNode & operator= (const std::string &content)
- void Set (const std::string &content)
- XMLNode & operator= (const XMLNode &node)

- XMLNode Attribute (int n=0)
- XMLNode Attribute (const char ∗name)
- XMLNode Attribute (const std::string &name)
- XMLNode NewAttribute (const char ∗name)
- XMLNode NewAttribute (const std::string &name)
- int AttributesSize (void) const
- void Namespaces (const NS &namespaces, bool keep=false, int recursion=-1)
- NS Namespaces (void)
- std::string NamespacePrefix (const char ∗urn)
- XMLNode NewChild (const char ∗name, int n=-1, bool global_order=false)
- XMLNode NewChild (const std::string &name, int n=-1, bool global_order=false)
- XMLNode NewChild (const char ∗name, const NS &namespaces, int n=-1, bool global_order=false)
- XMLNode NewChild (const std::string &name, const NS &namespaces, int n=-1, bool global_order=false)
- XMLNode NewChild (const XMLNode &node, int n=-1, bool global_order=false)
- void Replace (const XMLNode &node)
- void Destroy (void)
- XMLNodeList Path (const std::string &path)
- XMLNodeList XPathLookup (const std::string &xpathExpr, const NS &nsList)
- XMLNode GetRoot (void)
- XMLNode Parent (void)
- bool SaveToFile (const std::string &file_name) const
- bool SaveToStream (std::ostream &out) const
- bool ReadFromFile (const std::string &file_name)
- bool ReadFromStream (std::istream &in)
- bool Validate (const std::string &schema_file, std::string &err_msg)

Protected Member Functions

- XMLNode (xmlNodePtr node)

Protected Attributes

- bool is_owner_
- bool is_temporary_

Friends

- bool MatchXMLName (const XMLNode &node1, const XMLNode &node2)
- bool MatchXMLName (const XMLNode &node, const char ∗name)
- bool MatchXMLName (const XMLNode &node, const std::string &name)
- bool MatchXMLNamespace (const XMLNode &node1, const XMLNode &node2)
- bool MatchXMLNamespace (const XMLNode &node, const char ∗uri)
- bool MatchXMLNamespace (const XMLNode &node, const std::string &uri)

5.361.1 Detailed Description

Wrapper for LibXML library Tree interface.

This class wraps XML Node, Document and Property/Attribute structures. Each instance serves as pointer to actual LibXML element and provides convenient (for chosen purpose) methods for manipulating it. This class has no special ties to LibXML library and may be easily rewritten for any XML parser which provides interface similar to LibXML Tree. It implements only small subset of XML capabilities, which is probably enough for performing most of useful actions. This class also filters out (usually) useless textual nodes which are often used to make XML documents human-readable.

5.361.2 Constructor & Destructor Documentation

5.361.2.1 Arc::XMLNode::XMLNode (xmlNodePtr *node*) `[inline, protected]`

Private constructor for inherited classes Creates instance and links to existing LibXML structure. Acquired structure is not owned by class instance. If there is need to completely pass control of LibXML document to then instance's is_owner_ variable has to be set to true.

5.361.2.2 Arc::XMLNode::XMLNode (void) `[inline]`

Constructor of invalid node Created instance does not point to XML element. All methods are still allowed for such instance but produce no results.

5.361.2.3 Arc::XMLNode::XMLNode (const XMLNode & *node*) `[inline]`

Copies existing instance. Underlying XML element is NOT copied. Ownership is NOT inherited. Strictly speaking it shuld be no const here - but that conflicts with C++.

5.361.2.4 Arc::XMLNode::XMLNode (const std::string & *xml*)

Creates XML document structure from textual representation of XML document. - Created structure is pointed and owned by constructed instance

5.361.2.5 Arc::XMLNode::XMLNode (const char * *xml*, int *len* = `-1`)

Same as previous

5.361.2.6 Arc::XMLNode::XMLNode (long *ptr_addr*)

Copy constructor. Used by language bindigs

5.361.2.7 Arc::XMLNode::XMLNode (const NS & *ns*, const char ∗ *name*)

Creates empty XML document structure with specified namespaces. Created XML contains only root element named 'name'. Created structure is pointed and owned by constructed instance

5.361.2.8 Arc::XMLNode::∼XMLNode (void)

Destructor Also destroys underlying XML document if owned by this instance

5.361.3 Member Function Documentation

5.361.3.1 XMLNode Arc::XMLNode::Attribute (int *n* = 0)

Returns list of all attributes of node.

Returns XMLNode instance reresenting n-th attribute of node.

Referenced by Attribute().

5.361.3.2 XMLNode Arc::XMLNode::Attribute (const char ∗ *name*)

Returns XMLNode instance representing first attribute of node with specified by name

5.361.3.3 XMLNode Arc::XMLNode::Attribute (const std::string & *name*) [inline]

Returns XMLNode instance representing first attribute of node with specified by name

References Attribute().

5.361.3.4 int Arc::XMLNode::AttributesSize (void) const

Returns number of attributes of node

5.361.3.5 XMLNode Arc::XMLNode::Child (int *n* = 0)

Returns XMLNode instance representing n-th child of XML element. If such does not exist invalid XMLNode instance is returned

5.361.3.6 void Arc::XMLNode::Destroy (void)

Destroys underlying XML element. XML element is unlinked from XML tree and destroyed. After this operation XMLNode instance becomes invalid

5.361.3.7 void Arc::XMLNode::Exchange (XMLNode & *node*)

Exchanges XML (sub)trees. Following conbinations are possible If either this or node are refering owned XML tree (top level node) then references are simply exchanged. This operation is fast. If both this and node are refering to XML (sub)tree of different documents then (sub)trees are exchahed between documments. If both this and node are refering to XML (sub)tree of same document then (sub)trees are moved inside document. The main reason for this method is to provide effective way to insert one XML document inside another. One should take into account that if any of exchanged nodes is top level it must be also owner of document. Otherwise method will fail. If both nodes are top level owners and/or invlaid nodes then this method is identical to Swap().

5.361.3.8 std::string Arc::XMLNode::FullName (void) const `[inline]`

Returns prefix:name of XML node

References Prefix(), and Name().

5.361.3.9 XMLNode Arc::XMLNode::Get (const std::string & *name*) const `[inline]`

Same as operator[]

References operator[ ]().

5.361.3.10 void Arc::XMLNode::GetDoc (std::string & *out_xml_str,* bool *user_friendly* = `false`) const

Fills argument with whole XML document textual representation

5.361.3.11 XMLNode Arc::XMLNode::GetRoot (void)

Get the root node from any child node of the tree

5.361.3.12 void Arc::XMLNode::GetXML (std::string & *out_xml_str,* bool *user_friendly* = `false`) const

Fills argument with this instance XML subtree textual representation

5.361.3.13 void Arc::XMLNode::GetXML (std::string & *out_xml_str,* const std::string & *encoding,* bool *user_friendly* = `false`) const

Fills argument with this instance XML subtree textual representation if the XML subtree is corresponding to the encoding format specified in the argument, e.g. utf-8

5.361.3.14 void Arc::XMLNode::Move (XMLNode & *node*)

Moves content of this XML (sub)tree to node This opeartion is similar to New except that XML (sub)tree to refered by this is destroyed. This method is more effective than combination of New() and Destroy() because internally it is optimized not to copy data if not needed. The main purpose of this is to effectively extract part of XML document.

5.361.3.15 std::string Arc::XMLNode::Name (void) const

Returns name of XML node

Referenced by FullName(), and Name().

5.361.3.16 void Arc::XMLNode::Name (const char * *name*)

Assigns new name to XML node

5.361.3.17 void Arc::XMLNode::Name (const std::string & *name*) [inline]

Assigns new name to XML node

References Name().

5.361.3.18 std::string Arc::XMLNode::Namespace (void) const

Returns namespace URI of XML node

5.361.3.19 std::string Arc::XMLNode::NamespacePrefix (const char * *urn*)

Returns prefix of specified namespace. Empty string if no such namespace.

5.361.3.20 void Arc::XMLNode::Namespaces (const NS & *namespaces*, bool *keep* = false, int *recursion* = -1)

Assigns namespaces of XML document at point specified by this instance. If namespace already exists it gets new prefix. New namespaces are added. It is useful to apply this method to XML being processed in order to refer to it's elements by known prefix. If keep is set to false existing namespace definition residing at this instance and below are removed (default beavior). If recursion is set to positive number then depth of prefix replacement is limited by this number (0 limits it to this node only). For unlimted recursion use -1. If recursion is limited then value of keep is ignored and existing namespaces are always kept.

5.361.3.21 NS Arc::XMLNode::Namespaces (void)

Returns namespaces known at this node

5.361.3.22 void Arc::XMLNode::New (XMLNode & *node*) const

Creates a copy of XML (sub)tree. If object does not represent whole document - top level document is created. 'node' becomes a pointer owning new XML document.

5.361.3.23 XMLNode Arc::XMLNode::NewAttribute (const char ∗ *name*)

Creates new attribute with specified name.

Referenced by NewAttribute().

5.361.3.24 XMLNode Arc::XMLNode::NewAttribute (const std::string & *name*) [inline]

Creates new attribute with specified name.

References NewAttribute().

5.361.3.25 XMLNode Arc::XMLNode::NewChild (const char ∗ *name*, int *n* = -1, bool *global_order* = false)

Creates new child XML element at specified position with specified name. Default is to put it at end of list. If global order is true position applies to whole set of children, otherwise only to children of same name. Returns created node.

Referenced by NewChild().

5.361.3.26 XMLNode Arc::XMLNode::NewChild (const std::string & *name*, int *n* = -1, bool *global_order* = false) [inline]

Same as NewChild(const char∗,int,bool)

References NewChild().

5.361.3.27 XMLNode Arc::XMLNode::NewChild (const char ∗ *name*, const NS & *namespaces*, int *n* = -1, bool *global_order* = false)

Creates new child XML element at specified position with specified name and namespaces. For more information look at NewChild(const char∗,int,bool)

5.361.3.28 XMLNode Arc::XMLNode::NewChild (const std::string & *name*, const NS & *namespaces*, int *n* = `-1`, bool *global_order* = `false`) `[inline]`

Same as NewChild(const char∗,const NS&,int,bool)

References NewChild().

5.361.3.29 XMLNode Arc::XMLNode::NewChild (const XMLNode & *node*, int *n* = `-1`, bool *global_order* = `false`)

Link a copy of supplied XML node as child. Returns instance refering to new child. XML element is a copy of supplied one but not owned by returned instance

5.361.3.30 Arc::XMLNode::operator bool (void) const `[inline]`

Returns true if instance points to XML element - valid instance

References is_temporary_.

5.361.3.31 Arc::XMLNode::operator std::string (void) const

Returns textual content of node excluding content of children nodes

5.361.3.32 bool Arc::XMLNode::operator! (void) const `[inline]`

Returns true if instance does not point to XML element - invalid instance

References is_temporary_.

5.361.3.33 bool Arc::XMLNode::operator!= (const XMLNode & *node*) `[inline]`

Returns false if 'node' represents same XML element

5.361.3.34 bool Arc::XMLNode::operator!= (bool *val*) `[inline]`

This operator is needed to avoid ambiguity

5.361.3.35 bool Arc::XMLNode::operator!= (const std::string & *str*) `[inline]`

This operator is needed to avoid ambiguity

5.361.3.36 bool Arc::XMLNode::operator!= (const char ∗ *str*) `[inline]`

This operator is needed to avoid ambiguity

5.361.3.37 void Arc::XMLNode::operator++ (void)

Convenience operator to switch to next element of same name. If there is no such node this object becomes invalid.

5.361.3.38 void Arc::XMLNode::operator-- (void)

Convenience operator to switch to previous element of same name. If there is no such node this object becomes invalid.

5.361.3.39 XMLNode& Arc::XMLNode::operator= (const char ∗ *content*)

Sets textual content of node. All existing children nodes are discarded.

Referenced by operator=(), and Set().

5.361.3.40 XMLNode& Arc::XMLNode::operator= (const std::string & *content*) [inline]

Sets textual content of node. All existing children nodes are discarded.

References operator=().

5.361.3.41 XMLNode& Arc::XMLNode::operator= (const XMLNode & *node*)

Make instance refer to another XML node. Ownership is not inherited. Due to nature of XMLNode there should be no const here, but that does not fit into C++.

5.361.3.42 bool Arc::XMLNode::operator== (const XMLNode & *node*) [inline]

Returns true if 'node' represents same XML element

Referenced by Same().

5.361.3.43 bool Arc::XMLNode::operator== (bool *val*) [inline]

This operator is needed to avoid ambiguity

5.361.3.44 bool Arc::XMLNode::operator== (const std::string & *str*) [inline]

This operator is needed to avoid ambiguity

5.361.3.45 bool Arc::XMLNode::operator== (const char ∗ *str*) [inline]

This operator is needed to avoid ambiguity

5.361.3.46 XMLNode Arc::XMLNode::operator[] (const char ∗ *name*) const

Returns XMLNode instance representing first child element with specified name. Name may be "namespace_prefix:name", "namespace_uri:name" or simply "name". In last case namespace is ignored. If such node does not exist invalid XMLNode instance is returned. This method should not be marked const because obtaining unrestricted X-MLNode of child element allows modification of underlying XML tree. But in order to keep const in other places non-const-handling is passed to programmer. Otherwise C++ compiler goes nuts.

Referenced by operator[](), and Get().

5.361.3.47 XMLNode Arc::XMLNode::operator[] (const std::string & *name*) const [inline]

Similar to previous method

References operator[]().

5.361.3.48 XMLNode Arc::XMLNode::operator[] (int *n*) const

Returns XMLNode instance representing n-th node in sequence of siblings of same name. It's main purpose is to be used to retrieve element in array of children of same name like node["name"][5]. This method should not be marked const because obtaining unrestricted XMLNode of child element allows modification of underlying XML tree. But in order to keep const in other places non-const-handling is passed to programmer. Otherwise C++ compiler goes nuts.

5.361.3.49 XMLNode Arc::XMLNode::Parent (void)

Get the parent node from any child node of the tree

5.361.3.50 XMLNodeList Arc::XMLNode::Path (const std::string & *path*)

Collects nodes corresponding to specified path. This is a convenience function to cover common use of XPath but without performance hit. Path is made of node_name[/node-_name[...]] and is relative to current node. node_names are treated in same way as in operator[]. Returns all nodes which are represented by path.

5.361.3.51 std::string Arc::XMLNode::Prefix (void) const

Returns namespace prefix of XML node

Referenced by FullName().

5.361.3.52 bool Arc::XMLNode::ReadFromFile (const std::string & *file_name*)

Read XML document from file and associate it with this node

5.361.3.53 bool Arc::XMLNode::ReadFromStream (std::istream & *in*)

Read XML document from stream and associate it with this node

5.361.3.54 void Arc::XMLNode::Replace (const XMLNode & *node*)

Makes a copy of supplied XML node and makes this instance refere to it

5.361.3.55 bool Arc::XMLNode::Same (const XMLNode & *node*) [inline]

Returns true if 'node' represents same XML element - for bindings

References operator==().

5.361.3.56 bool Arc::XMLNode::SaveToFile (const std::string & *file_name*) const

Save string representation of node to file

5.361.3.57 bool Arc::XMLNode::SaveToStream (std::ostream & *out*) const

Save string representation of node to stream

5.361.3.58 void Arc::XMLNode::Set (const std::string & *content*) [inline]

Same as operator=. Used for bindings.

References operator=().

5.361.3.59 int Arc::XMLNode::Size (void) const

Returns number of children nodes

5.361.3.60 void Arc::XMLNode::Swap (XMLNode & *node*)

Swaps XML (sub)trees to this this and node refer. For XML subtrees this method is not anyhow different then using combinaiion XMLNode tmp=∗this; ∗this=node; node=tmp; But in case of either this or node owning XML document ownership is swapped too. And this is a main purpose of Swap() method.

5.361.3.61 bool Arc::XMLNode::Validate (const std::string & *schema_file,* std::string & *err_msg*)

Remove all eye-candy information leaving only informational parts ∗ void Purify(void); XML schema validation against the schema file defined as argument

5.361.3.62 XMLNodeList Arc::XMLNode::XPathLookup (const std::string & *xpathExpr,* const NS & *nsList*)

Uses xPath to look up the whole xml structure, Returns a list of XMLNode points. The xpathExpr should be like "//xx:child1/" which indicates the namespace and node that you would like to find; The nsList is the namespace the result should belong to (e.g. xx="uri:test"). Query is run on whole XML document but only the elements belonging to this XML subtree are returned.

5.361.4 Friends And Related Function Documentation

5.361.4.1 bool MatchXMLName (const XMLNode & *node1,* const XMLNode & *node2*) `[friend]`

Returns true if underlying XML elements have same names

5.361.4.2 bool MatchXMLName (const XMLNode & *node,* const char ∗ *name*) `[friend]`

Returns true if 'name' matches name of 'node'. If name contains prefix it's checked too

5.361.4.3 bool MatchXMLName (const XMLNode & *node,* const std::string & *name*) `[friend]`

Returns true if 'name' matches name of 'node'. If name contains prefix it's checked too

5.361.4.4 bool MatchXMLNamespace (const XMLNode & *node1,* const XMLNode & *node2*) `[friend]`

Returns true if underlying XML elements belong to same namespaces

5.361.4.5 bool MatchXMLNamespace (const XMLNode & *node,* const char ∗ *uri*) `[friend]`

Returns true if 'namespace' matches 'node's namespace.

5.361.4.6 bool MatchXMLNamespace (const **XMLNode** & *node*, const std::string & *uri*) `[friend]`

Returns true if 'namespace' matches 'node's namespace.

5.361.5 Field Documentation

5.361.5.1 bool **Arc::XMLNode::is_owner_** `[protected]`

If true node is owned by this instance - hence released in destructor. Normally that may be true only for top level node of XML document.

5.361.5.2 bool **Arc::XMLNode::is_temporary_** `[protected]`

This variable is for future

Referenced by operator bool(), and operator!().

The documentation for this class was generated from the following file:

- XMLNode.h

5.362 Arc::XMLNodeContainer Class Reference

`#include <XMLNode.h>`

Public Member Functions

- XMLNodeContainer (void)
- XMLNodeContainer (const XMLNodeContainer &)
- XMLNodeContainer & operator= (const XMLNodeContainer &)
- void Add (const XMLNode &)
- void Add (const std::list< XMLNode > &)
- void AddNew (const XMLNode &)
- void AddNew (const std::list< XMLNode > &)
- int Size (void) const
- XMLNode operator[] (int)
- std::list< XMLNode > Nodes (void)

5.362.1 Detailed Description

Container for multiple XMLNode elements

5.362.2 Constructor & Destructor Documentation

5.362.2.1 Arc::XMLNodeContainer::XMLNodeContainer (void)

Default constructor

5.362.2.2 Arc::XMLNodeContainer::XMLNodeContainer (const **XMLNodeContainer** &)

Copy constructor. Add nodes from argument. Nodes owning XML document are copied using AddNew(). Not owning nodes are linked using Add() method.

5.362.3 Member Function Documentation

5.362.3.1 void Arc::XMLNodeContainer::Add (const **XMLNode** &)

Link XML subtree refered by node to container. XML tree must be available as long as this object is used.

5.362.3.2 void Arc::XMLNodeContainer::Add (const std::list< **XMLNode** > &)

Link multiple XML subtrees to container.

5.362.3.3 void Arc::XMLNodeContainer::AddNew (const **XMLNode** &)

Copy XML subtree referenced by node to container. After this operation container refers to independent XML document. This document is deleted when container is destroyed.

5.362.3.4 void Arc::XMLNodeContainer::AddNew (const std::list< **XMLNode** > &)

Copy multiple XML subtrees to container.

5.362.3.5 std::list<**XMLNode**> Arc::XMLNodeContainer::Nodes (void)

Returns all stored nodes.

5.362.3.6 **XMLNodeContainer**& Arc::XMLNodeContainer::operator= (const **XMLNodeContainer** &)

Same as copy constructor with current nodes being deleted first.

5.362.3.7 XMLNode Arc::XMLNodeContainer::operator[] (int)

Returns n-th node in a store.

5.362.3.8 int Arc::XMLNodeContainer::Size (void) const

Return number of refered/stored nodes.

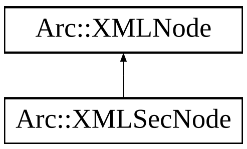
The documentation for this class was generated from the following file:

- XMLNode.h

5.363 Arc::XMLSecNode Class Reference

`#include <XMLSecNode.h>`

Inheritance diagram for Arc::XMLSecNode:



Public Member Functions

- XMLSecNode (XMLNode &node)
- void AddSignatureTemplate (const std::string &id_name, const SignatureMethod sign_method, const std::string &incl_namespaces="")
- bool SignNode (const std::string &privkey_file, const std::string &cert_file)
- bool VerifyNode (const std::string &id_name, const std::string &ca_file, const std::string &ca_path, bool verify_trusted=true)
- bool EncryptNode (const std::string &cert_file, const SymEncryptionType encrpt_type)
- bool DecryptNode (const std::string &privkey_file, XMLNode &decrypted_node)

5.363.1 Detailed Description

Extends XMLNode class to support XML security operation.

All XMLNode methods are exposed by inheriting from XMLNode. XMLSecNode itself does not own node, instead it uses the node from the base class XMLNode.

5.363.2 Constructor & Destructor Documentation

5.363.2.1 Arc::XMLSecNode::XMLSecNode (XMLNode & *node*)

Create a object based on an XMLNode instance.

5.363.3 Member Function Documentation

5.363.3.1 void Arc::XMLSecNode::AddSignatureTemplate (const std::string & *id_name,* const SignatureMethod *sign_method,* const std::string & *incl_namespaces =* "")

Add the signature template for later signing.

Parameters

id_name	The identifier name under this node which will be used for the <-Signature> to refer to.
sign_method	The sign method for signing. Two options now, RSA_SHA1, DSA_SH-A1

5.363.3.2 bool Arc::XMLSecNode::DecryptNode (const std::string & *privkey_file,* XMLNode & *decrypted_node*)

Decrypt the <xenc:EncryptedData/> under this node, the decrypted node will be output in the second argument of DecryptNode method. And the <xenc:EncryptedData/> under this node will be removed after decryption.

Parameters

privkey_file	The private key file, which is used for decrypting
decrypted_-node	Output the decrypted node

5.363.3.3 bool Arc::XMLSecNode::EncryptNode (const std::string & *cert_file,* const SymEncryptionType *encrpt_type*)

Encrypt this node, after encryption, this node will be replaced by the encrypted node

Parameters

cert_file	The certificate file, the public key parsed from this certificate is used to encrypted the symmetric key, and then the symmetric key is used to encrypted the node
encrpt_type	The encryption type when encrypting the node, four option in Sym-EncryptionType
verify_-trusted	Verify trusted certificates or not. If set to false, then only the signature will be checked (by using the public key from KeyInfo).

5.363.3.4 bool Arc::XMLSecNode::SignNode (const std::string & *privkey_file*, const std::string & *cert_file*)

Sign this node (identified by id_name).

Parameters

privkey_file	The private key file. The private key is used for signing
cert_file	The certificate file. The certificate is used as the <KeyInfo> part of the <Signature>; <KeyInfo> will be used for the other end to verify this <Signature>
incl_-namespaces	InclusiveNamespaces for Tranform in Signature

5.363.3.5 bool Arc::XMLSecNode::VerifyNode (const std::string & *id_name*, const std::string & *ca_file*, const std::string & *ca_path*, bool *verify_trusted* = `true`)

Verify the signature under this node

Parameters

id_name	The id of this node, which is used for identifying the node
ca_file	The CA file which used as trused certificate when verify the certificate in the <KeyInfo> part of <Signature>
ca_path	The CA directory; either ca_file or ca_path should be set.

The documentation for this class was generated from the following file:

- XMLSecNode.h