

Hosting Environment (Daemon)

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Contents

1	Namespace Index	1
1.1	Namespace List	1
2	Data Structure Index	3
2.1	Class Hierarchy	3
3	Data Structure Index	11
3.1	Data Structures	11
4	File Index	19
4.1	File List	19
5	Namespace Documentation	23
5.1	Arc Namespace Reference	23
5.1.1	Detailed Description	33
5.1.2	Typedef Documentation	34
5.1.2.1	AttrConstIter	34
5.1.2.2	AttrIter	35
5.1.2.3	AttrMap	35
5.1.2.4	get_plugin_instance	35
5.1.3	Enumeration Type Documentation	35
5.1.3.1	LogLevel	35
5.1.3.2	StatusKind	35
5.1.3.3	WSAFault	35
5.1.4	Function Documentation	36
5.1.4.1	addVOMSAC	36
5.1.4.2	ContentFromPayload	36
5.1.4.3	CreateThreadFunction	36
5.1.4.4	createVOMSAC	36
5.1.4.5	final_xmlsec	36

5.1.4.6	get_cert_str	37
5.1.4.7	get_key_from_certfile	37
5.1.4.8	get_key_from_certstr	37
5.1.4.9	get_key_from_keyfile	37
5.1.4.10	get_key_from_keystr	37
5.1.4.11	get_node	37
5.1.4.12	init_xmlsec	37
5.1.4.13	load_key_from_certfile	37
5.1.4.14	load_key_from_certstr	37
5.1.4.15	load_key_from_keyfile	37
5.1.4.16	load_trusted_cert_file	38
5.1.4.17	load_trusted_cert_str	38
5.1.4.18	load_trusted_certs	38
5.1.4.19	MatchXMLName	38
5.1.4.20	MatchXMLName	38
5.1.4.21	MatchXMLName	38
5.1.4.22	MatchXMLNamespace	38
5.1.4.23	MatchXMLNamespace	38
5.1.4.24	MatchXMLNamespace	38
5.1.4.25	OpenSSLInit	38
5.1.4.26	operator<<	39
5.1.4.27	operator<<	39
5.1.4.28	operator<<	39
5.1.4.29	parseVOMSAC	39
5.1.4.30	parseVOMSAC	39
5.1.4.31	passphrase_callback	40
5.1.4.32	string	40
5.1.4.33	TimeStamp	40
5.1.4.34	TimeStamp	40
5.1.4.35	VOMSDecode	40
5.1.4.36	WSAFaultAssign	40
5.1.4.37	WSAFaultExtract	40
5.1.5	Variable Documentation	40
5.1.5.1	CredentialLogger	40
5.1.5.2	plugins_table_name	41
5.1.5.3	thread_stacksize	41

5.2	ArcCredential Namespace Reference	42
5.2.1	Detailed Description	42
5.2.2	Enumeration Type Documentation	43
5.2.2.1	certType	43
6	Data Structure Documentation	45
6.1	ArcCredential::ACACI Struct Reference	45
6.2	ArcCredential::ACATTHOLDER Struct Reference	46
6.3	ArcCredential::ACATTR Struct Reference	47
6.4	ArcCredential::ACATTRIBUTE Struct Reference	48
6.5	ArcCredential::ACC Struct Reference	49
6.6	ArcCredential::ACCERTS Struct Reference	50
6.7	ArcCredential::ACDIGEST Struct Reference	51
6.8	ArcCredential::ACFORM Struct Reference	52
6.9	ArcCredential::ACFULLATTRIBUTES Struct Reference	53
6.10	ArcCredential::ACHOLDER Struct Reference	54
6.11	ArcCredential::ACIETFATTR Struct Reference	55
6.12	ArcCredential::ACINFO Struct Reference	56
6.13	ArcCredential::ACIS Struct Reference	57
6.14	ArcCredential::ACSEQ Struct Reference	58
6.15	ArcCredential::ACTARGET Struct Reference	59
6.16	ArcCredential::ACTARGETS Struct Reference	60
6.17	ArcCredential::ACVAL Struct Reference	61
6.18	Arc::Adler32Sum Class Reference	62
6.18.1	Detailed Description	62
6.19	ArcSec::AlgFactory Class Reference	63
6.19.1	Detailed Description	63
6.19.2	Member Function Documentation	63
6.19.2.1	createAlg	63
6.20	ArcSec::AnyURIAttribute Class Reference	64
6.20.1	Member Function Documentation	64
6.20.1.1	encode	64
6.20.1.2	getId	64
6.20.1.3	getType	64
6.21	Arc::ApplicationEnvironment Class Reference	65
6.21.1	Detailed Description	65
6.22	Arc::ApplicationType Class Reference	66

6.23	Arc::ARCJSDDLParser Class Reference	67
6.24	Arc::ArcLocation Class Reference	68
6.24.1	Detailed Description	68
6.24.2	Member Function Documentation	68
6.24.2.1	GetPlugins	68
6.24.2.2	Init	68
6.25	ArcSec::ArcPeriod Struct Reference	69
6.26	Arc::ARCPolicyHandlerConfig Class Reference	70
6.27	ArcSec::Attr Struct Reference	71
6.27.1	Detailed Description	71
6.28	ArcSec::AttributeFactory Class Reference	72
6.28.1	Detailed Description	72
6.29	Arc::AttributeIterator Class Reference	73
6.29.1	Detailed Description	73
6.29.2	Constructor & Destructor Documentation	73
6.29.2.1	AttributeIterator	73
6.29.2.2	AttributeIterator	74
6.29.3	Member Function Documentation	74
6.29.3.1	hasMore	74
6.29.3.2	key	74
6.29.3.3	operator*	74
6.29.3.4	operator++	74
6.29.3.5	operator++	74
6.29.3.6	operator->	75
6.29.4	Friends And Related Function Documentation	75
6.29.4.1	MessageAttributes	75
6.29.5	Field Documentation	75
6.29.5.1	current_	75
6.29.5.2	end_	75
6.30	ArcSec::AttributeProxy Class Reference	76
6.30.1	Detailed Description	76
6.30.2	Member Function Documentation	76
6.30.2.1	getAttribute	76
6.31	ArcSec::AttributeValue Class Reference	77
6.31.1	Detailed Description	77
6.31.2	Member Function Documentation	78

6.31.2.1	encode	78
6.31.2.2	equal	78
6.31.2.3	getId	78
6.31.2.4	getType	78
6.32	ArcSec::Attrs Class Reference	79
6.32.1	Detailed Description	79
6.33	ArcSec::AuthzRequest Struct Reference	80
6.34	ArcSec::AuthzRequestSection Struct Reference	81
6.34.1	Detailed Description	81
6.35	Arc::AutoPointer< T > Class Template Reference	82
6.35.1	Detailed Description	82
6.36	Arc::Base64 Class Reference	83
6.37	Arc::BaseConfig Class Reference	84
6.37.1	Detailed Description	84
6.37.2	Member Function Documentation	84
6.37.2.1	AddCADir	84
6.37.2.2	AddCAFile	84
6.37.2.3	AddCertificate	84
6.37.2.4	AddOverlay	84
6.37.2.5	AddPluginsPath	85
6.37.2.6	AddPrivateKey	85
6.37.2.7	AddProxy	85
6.37.2.8	GetOverlay	85
6.37.2.9	MakeConfig	85
6.38	ArcSec::BooleanAttribute Class Reference	86
6.38.1	Member Function Documentation	86
6.38.1.1	encode	86
6.38.1.2	getId	86
6.38.1.3	getType	86
6.39	Arc::Broker Class Reference	87
6.39.1	Member Function Documentation	87
6.39.1.1	GetBestTarget	87
6.39.1.2	PreFilterTargets	87
6.39.1.3	SortTargets	88
6.39.2	Field Documentation	88
6.39.2.1	PossibleTargets	88

6.40	Arc::BrokerLoader Class Reference	89
6.40.1	Detailed Description	89
6.40.2	Constructor & Destructor Documentation	89
6.40.2.1	BrokerLoader	89
6.40.2.2	~BrokerLoader	89
6.40.3	Member Function Documentation	89
6.40.3.1	GetBrokers	89
6.40.3.2	load	89
6.41	Arc::BrokerPluginArgument Class Reference	91
6.42	Arc::ByteArray Class Reference	92
6.43	Arc::CacheParameters Struct Reference	93
6.43.1	Detailed Description	93
6.44	ArcCredential::cert_verify_context Struct Reference	94
6.45	Arc::ChainContext Class Reference	95
6.45.1	Detailed Description	95
6.45.2	Member Function Documentation	95
6.45.2.1	operator PluginsFactory *	95
6.46	Arc::Checksum Class Reference	96
6.46.1	Detailed Description	96
6.47	Arc::ChecksumAny Class Reference	97
6.47.1	Detailed Description	97
6.48	Arc::CStringValue Class Reference	98
6.48.1	Detailed Description	98
6.48.2	Constructor & Destructor Documentation	98
6.48.2.1	CStringValue	98
6.48.2.2	CStringValue	98
6.48.2.3	CStringValue	98
6.48.3	Member Function Documentation	98
6.48.3.1	equal	98
6.48.3.2	operator bool	99
6.49	Arc::ClassLoader Class Reference	100
6.50	Arc::ClassLoaderPluginArgument Class Reference	101
6.51	Arc::ClientHTTP Class Reference	102
6.52	Arc::ClientHTTPwithSAML2SSO Class Reference	103
6.52.1	Constructor & Destructor Documentation	103
6.52.1.1	ClientHTTPwithSAML2SSO	103

6.52.2	Member Function Documentation	103
6.52.2.1	process	103
6.53	Arc::ClientInterface Class Reference	104
6.54	Arc::ClientSOAP Class Reference	105
6.54.1	Detailed Description	105
6.54.2	Constructor & Destructor Documentation	105
6.54.2.1	ClientSOAP	105
6.54.3	Member Function Documentation	105
6.54.3.1	AddSecHandler	105
6.54.3.2	GetEntry	106
6.54.3.3	Load	106
6.54.3.4	process	106
6.54.3.5	process	106
6.55	Arc::ClientSOAPwithSAML2SSO Class Reference	107
6.55.1	Constructor & Destructor Documentation	107
6.55.1.1	ClientSOAPwithSAML2SSO	107
6.55.2	Member Function Documentation	107
6.55.2.1	process	107
6.55.2.2	process	107
6.56	Arc::ClientTCP Class Reference	108
6.57	Arc::ClientX509Delegation Class Reference	109
6.57.1	Constructor & Destructor Documentation	109
6.57.1.1	ClientX509Delegation	109
6.57.2	Member Function Documentation	109
6.57.2.1	acquireDelegation	109
6.57.2.2	createDelegation	109
6.58	ArcSec::CombiningAlg Class Reference	111
6.58.1	Detailed Description	111
6.58.2	Member Function Documentation	111
6.58.2.1	combine	111
6.58.2.2	getalgId	111
6.59	Arc::Config Class Reference	113
6.59.1	Detailed Description	113
6.59.2	Constructor & Destructor Documentation	113
6.59.2.1	Config	113
6.59.2.2	Config	113

6.59.2.3	Config	113
6.59.2.4	Config	114
6.59.2.5	Config	114
6.59.2.6	Config	114
6.59.3	Member Function Documentation	114
6.59.3.1	getFileName	114
6.59.3.2	parse	114
6.59.3.3	print	114
6.59.3.4	save	114
6.59.3.5	setFileName	114
6.60	Arc::ConfusaCertHandler Class Reference	115
6.60.1	Detailed Description	115
6.60.2	Constructor & Destructor Documentation	115
6.60.2.1	ConfusaCertHandler	115
6.60.3	Member Function Documentation	115
6.60.3.1	createCertRequest	115
6.60.3.2	getCertRequestB64	115
6.61	Arc::ConfusaParserUtils Class Reference	116
6.61.1	Detailed Description	116
6.61.2	Member Function Documentation	116
6.61.2.1	destroy_doc	116
6.61.2.2	evaluate_path	116
6.61.2.3	extract_body_information	116
6.61.2.4	get_doc	116
6.61.2.5	handle_redirect_step	117
6.61.2.6	urlencode	117
6.61.2.7	urlencode_params	117
6.62	Arc::CountedPointer< T > Class Template Reference	118
6.62.1	Detailed Description	118
6.63	Arc::Counter Class Reference	119
6.63.1	Detailed Description	120
6.63.2	Member Typedef Documentation	121
6.63.2.1	IDType	121
6.63.3	Constructor & Destructor Documentation	121
6.63.3.1	Counter	121
6.63.3.2	~Counter	121

6.63.4	Member Function Documentation	121
6.63.4.1	cancel	121
6.63.4.2	changeExcess	121
6.63.4.3	changeLimit	122
6.63.4.4	extend	122
6.63.4.5	getCounterTicket	122
6.63.4.6	getCurrentTime	123
6.63.4.7	getExcess	123
6.63.4.8	getExpirationReminder	123
6.63.4.9	getExpiryTime	123
6.63.4.10	getLimit	123
6.63.4.11	getValue	124
6.63.4.12	reserve	124
6.63.4.13	setExcess	124
6.63.4.14	setLimit	125
6.64	Arc::CounterTicket Class Reference	126
6.64.1	Detailed Description	126
6.64.2	Constructor & Destructor Documentation	126
6.64.2.1	CounterTicket	126
6.64.3	Member Function Documentation	126
6.64.3.1	cancel	126
6.64.3.2	extend	127
6.64.3.3	isValid	127
6.65	Arc::CRC32Sum Class Reference	128
6.65.1	Detailed Description	128
6.66	Arc::Credential Class Reference	129
6.66.1	Constructor & Destructor Documentation	130
6.66.1.1	Credential	130
6.66.1.2	Credential	130
6.66.1.3	Credential	130
6.66.1.4	Credential	130
6.66.1.5	Credential	131
6.66.2	Member Function Documentation	131
6.66.2.1	AddCertExtObj	131
6.66.2.2	AddExtension	131
6.66.2.3	AddExtension	131

6.66.2.4	GenerateEECRequest	132
6.66.2.5	GenerateEECRequest	132
6.66.2.6	GenerateEECRequest	132
6.66.2.7	GenerateRequest	132
6.66.2.8	GenerateRequest	132
6.66.2.9	GenerateRequest	132
6.66.2.10	GetCert	132
6.66.2.11	GetCertNumofChain	132
6.66.2.12	GetCertReq	132
6.66.2.13	GetDN	132
6.66.2.14	GetEndTime	133
6.66.2.15	getFormat	133
6.66.2.16	GetIdentityName	133
6.66.2.17	GetLifeTime	133
6.66.2.18	GetPrivKey	133
6.66.2.19	GetProxyPolicy	133
6.66.2.20	GetPubKey	133
6.66.2.21	GetStartTime	133
6.66.2.22	GetType	133
6.66.2.23	InitProxyCertInfo	133
6.66.2.24	InquireRequest	133
6.66.2.25	InquireRequest	134
6.66.2.26	InquireRequest	134
6.66.2.27	LogError	134
6.66.2.28	OutputCertificate	134
6.66.2.29	OutputCertificateChain	134
6.66.2.30	OutputPrivatekey	134
6.66.2.31	OutputPublickey	134
6.66.2.32	SetLifeTime	135
6.66.2.33	SetProxyPolicy	135
6.66.2.34	SetStartTime	135
6.66.2.35	SignEECRequest	135
6.66.2.36	SignEECRequest	135
6.66.2.37	SignEECRequest	135
6.66.2.38	SignRequest	135
6.66.2.39	SignRequest	135

6.66.2.40	SignRequest	136
6.66.2.41	STACK_OF	136
6.67	Arc::CredentialError Class Reference	137
6.67.1	Detailed Description	137
6.67.2	Constructor & Destructor Documentation	137
6.67.2.1	CredentialError	137
6.68	Arc::Database Class Reference	138
6.68.1	Detailed Description	138
6.68.2	Constructor & Destructor Documentation	138
6.68.2.1	Database	138
6.68.2.2	Database	138
6.68.2.3	Database	138
6.68.2.4	~Database	138
6.68.3	Member Function Documentation	139
6.68.3.1	close	139
6.68.3.2	connect	139
6.68.3.3	enable_ssl	139
6.68.3.4	isconnected	139
6.68.3.5	shutdown	139
6.69	Arc::DataBuffer Class Reference	140
6.69.1	Detailed Description	141
6.69.2	Constructor & Destructor Documentation	141
6.69.2.1	DataBuffer	141
6.69.2.2	DataBuffer	141
6.69.3	Member Function Documentation	141
6.69.3.1	add	141
6.69.3.2	buffer_size	141
6.69.3.3	checksum_object	142
6.69.3.4	checksum_valid	142
6.69.3.5	eof_read	142
6.69.3.6	eof_read	142
6.69.3.7	eof_write	142
6.69.3.8	eof_write	142
6.69.3.9	error	142
6.69.3.10	error_read	142
6.69.3.11	error_write	143

6.69.3.12	for_read	143
6.69.3.13	for_read	143
6.69.3.14	for_write	143
6.69.3.15	for_write	143
6.69.3.16	is_notwritten	143
6.69.3.17	is_notwritten	144
6.69.3.18	is_read	144
6.69.3.19	is_read	144
6.69.3.20	is_written	144
6.69.3.21	is_written	144
6.69.3.22	set	145
6.69.3.23	wait_any	145
6.70	Arc::DataCallback Class Reference	146
6.70.1	Detailed Description	146
6.71	Arc::DataHandle Class Reference	147
6.71.1	Detailed Description	147
6.72	Arc::DataMover Class Reference	148
6.72.1	Detailed Description	148
6.72.2	Member Function Documentation	148
6.72.2.1	checks	148
6.72.2.2	checks	148
6.72.2.3	force_to_meta	149
6.72.2.4	secure	149
6.72.2.5	set_default_max_inactivity_time	149
6.72.2.6	set_default_min_average_speed	149
6.72.2.7	set_default_min_speed	149
6.72.2.8	Transfer	149
6.72.2.9	Transfer	149
6.72.2.10	verbose	150
6.73	Arc::DataPoint Class Reference	151
6.73.1	Detailed Description	152
6.73.2	Member Function Documentation	152
6.73.2.1	AddLocation	152
6.73.2.2	ApplySecurity	153
6.73.2.3	Check	153
6.73.2.4	CompareMeta	153

6.73.2.5	CurrentLocationMetadata	153
6.73.2.6	GetFailureReason	153
6.73.2.7	ListFiles	153
6.73.2.8	NextLocation	154
6.73.2.9	NextTry	154
6.73.2.10	Passive	154
6.73.2.11	PostRegister	154
6.73.2.12	PreRegister	154
6.73.2.13	PreUnregister	154
6.73.2.14	ProvidesMeta	155
6.73.2.15	Range	155
6.73.2.16	ReadOutOfOrder	155
6.73.2.17	Registered	155
6.73.2.18	Resolve	155
6.73.2.19	SetAdditionalChecks	155
6.73.2.20	SetMeta	156
6.73.2.21	SetSecure	156
6.73.2.22	StartReading	156
6.73.2.23	StartWriting	156
6.73.2.24	StopReading	157
6.73.2.25	StopWriting	157
6.73.2.26	Unregister	157
6.73.2.27	WriteOutOfOrder	157
6.74	Arc::DataPointDirect Class Reference	158
6.74.1	Detailed Description	158
6.74.2	Member Function Documentation	159
6.74.2.1	AddLocation	159
6.74.2.2	CurrentLocationMetadata	159
6.74.2.3	NextLocation	159
6.74.2.4	Passive	159
6.74.2.5	PostRegister	159
6.74.2.6	PreRegister	160
6.74.2.7	PreUnregister	160
6.74.2.8	ProvidesMeta	160
6.74.2.9	Range	160
6.74.2.10	ReadOutOfOrder	160

6.74.2.11	Registered	160
6.74.2.12	Resolve	161
6.74.2.13	SetAdditionalChecks	161
6.74.2.14	SetSecure	161
6.74.2.15	Unregister	161
6.74.2.16	WriteOutOfOrder	161
6.75	Arc::DataPointIndex Class Reference	162
6.75.1	Detailed Description	162
6.75.2	Member Function Documentation	163
6.75.2.1	AddLocation	163
6.75.2.2	Check	163
6.75.2.3	CurrentLocationMetadata	163
6.75.2.4	NextLocation	163
6.75.2.5	Passive	163
6.75.2.6	ProvidesMeta	163
6.75.2.7	Range	164
6.75.2.8	ReadOutOfOrder	164
6.75.2.9	Registered	164
6.75.2.10	SetAdditionalChecks	164
6.75.2.11	SetSecure	164
6.75.2.12	StartReading	164
6.75.2.13	StartWriting	165
6.75.2.14	StopReading	165
6.75.2.15	StopWriting	165
6.75.2.16	WriteOutOfOrder	165
6.76	Arc::DataSourceType Class Reference	166
6.77	Arc::DataSpeed Class Reference	167
6.77.1	Detailed Description	167
6.77.2	Constructor & Destructor Documentation	167
6.77.2.1	DataSpeed	167
6.77.2.2	DataSpeed	168
6.77.3	Member Function Documentation	168
6.77.3.1	hold	168
6.77.3.2	set_base	168
6.77.3.3	set_max_data	168
6.77.3.4	set_max_inactivity_time	168

6.77.3.5	set_min_average_speed	169
6.77.3.6	set_min_speed	169
6.77.3.7	set_progress_indicator	169
6.77.3.8	transfer	169
6.77.3.9	verbose	169
6.77.3.10	verbose	169
6.78	Arc::DataStagingType Class Reference	170
6.79	Arc::DataStatus Class Reference	171
6.79.1	Detailed Description	171
6.79.2	Member Enumeration Documentation	171
6.79.2.1	DataStatusType	171
6.80	Arc::DataTargetType Class Reference	173
6.81	Arc::DataType Class Reference	174
6.82	ArcSec::DateAttribute Class Reference	175
6.82.1	Member Function Documentation	175
6.82.1.1	encode	175
6.82.1.2	getId	175
6.82.1.3	getType	175
6.83	ArcSec::DateTimeAttribute Class Reference	176
6.83.1	Detailed Description	176
6.83.2	Member Function Documentation	176
6.83.2.1	encode	176
6.83.2.2	getId	176
6.83.2.3	getType	176
6.84	Arc::DBranch Class Reference	177
6.85	Arc::DelegationConsumer Class Reference	178
6.85.1	Detailed Description	178
6.85.2	Constructor & Destructor Documentation	178
6.85.2.1	DelegationConsumer	178
6.85.2.2	DelegationConsumer	178
6.85.3	Member Function Documentation	178
6.85.3.1	Acquire	178
6.85.3.2	Acquire	179
6.85.3.3	Backup	179
6.85.3.4	Generate	179
6.85.3.5	ID	179

6.85.3.6	LogError	179
6.85.3.7	Request	179
6.85.3.8	Restore	179
6.86	Arc::DelegationConsumerSOAP Class Reference	180
6.86.1	Detailed Description	180
6.86.2	Constructor & Destructor Documentation	180
6.86.2.1	DelegationConsumerSOAP	180
6.86.2.2	DelegationConsumerSOAP	180
6.86.3	Member Function Documentation	180
6.86.3.1	DelegateCredentialsInit	180
6.86.3.2	DelegatedToken	181
6.86.3.3	UpdateCredentials	181
6.86.3.4	UpdateCredentials	181
6.87	Arc::DelegationContainerSOAP Class Reference	182
6.87.1	Detailed Description	182
6.87.2	Member Function Documentation	182
6.87.2.1	DelegateCredentialsInit	182
6.87.2.2	DelegatedToken	182
6.87.2.3	UpdateCredentials	182
6.87.3	Field Documentation	182
6.87.3.1	context_lock_	182
6.87.3.2	max_duration_	183
6.87.3.3	max_size_	183
6.87.3.4	max_usage_	183
6.87.3.5	restricted_	183
6.88	Arc::DelegationProvider Class Reference	184
6.88.1	Detailed Description	184
6.88.2	Constructor & Destructor Documentation	184
6.88.2.1	DelegationProvider	184
6.88.2.2	DelegationProvider	184
6.88.3	Member Function Documentation	184
6.88.3.1	Delegate	184
6.89	Arc::DelegationProviderSOAP Class Reference	185
6.89.1	Detailed Description	185
6.89.2	Constructor & Destructor Documentation	185
6.89.2.1	DelegationProviderSOAP	185

6.89.2.2	DelegationProviderSOAP	185
6.89.3	Member Function Documentation	186
6.89.3.1	DelegateCredentialsInit	186
6.89.3.2	DelegateCredentialsInit	186
6.89.3.3	DelegatedToken	186
6.89.3.4	ID	186
6.89.3.5	UpdateCredentials	186
6.89.3.6	UpdateCredentials	186
6.90	ArcSec::DenyOverridesCombiningAlg Class Reference	187
6.90.1	Detailed Description	187
6.90.2	Member Function Documentation	187
6.90.2.1	combine	187
6.90.2.2	getalgId	187
6.91	Arc::DirectoryType Class Reference	188
6.92	Arc::DiskSpaceRequirementType Class Reference	189
6.93	Arc::DItem Class Reference	190
6.94	Arc::DItemString Class Reference	191
6.95	Arc::DMC Class Reference	192
6.96	Arc::DMCConfig Class Reference	193
6.96.1	Member Function Documentation	193
6.96.1.1	MakeConfig	193
6.97	Arc::DMCLoader Class Reference	194
6.97.1	Constructor & Destructor Documentation	194
6.97.1.1	DMCLoader	194
6.97.1.2	~DMCLoader	194
6.98	Arc::DMCPluginArgument Class Reference	195
6.99	Arc::DNListHandlerConfig Class Reference	196
6.100	ArcSec::DurationAttribute Class Reference	197
6.100.1	Detailed Description	197
6.100.2	Member Function Documentation	197
6.100.2.1	encode	197
6.100.2.2	getId	197
6.100.2.3	getType	197
6.101	ArcSec::EqualFunction Class Reference	198
6.101.1	Detailed Description	198
6.101.2	Member Function Documentation	198

6.101.2.1 evaluate	198
6.101.2.2 evaluate	198
6.101.2.3 getFunctionName	198
6.102 ArcSec::EvalResult Struct Reference	200
6.102.1 Detailed Description	200
6.103 ArcSec::EvaluationCtx Class Reference	201
6.103.1 Detailed Description	201
6.103.2 Constructor & Destructor Documentation	201
6.103.2.1 EvaluationCtx	201
6.104 ArcSec::Evaluator Class Reference	202
6.104.1 Detailed Description	202
6.104.2 Member Function Documentation	202
6.104.2.1 addPolicy	202
6.104.2.2 addPolicy	202
6.104.2.3 evaluate	203
6.104.2.4 evaluate	203
6.104.2.5 evaluate	203
6.104.2.6 evaluate	203
6.104.2.7 evaluate	203
6.104.2.8 evaluate	203
6.104.2.9 evaluate	203
6.104.2.10 getAlgFactory	203
6.104.2.11 getAttrFactory	204
6.104.2.12 getFnFactory	204
6.104.2.13 getName	204
6.104.2.14 setCombiningAlg	204
6.104.2.15 setCombiningAlg	204
6.105 ArcSec::EvaluatorContext Class Reference	205
6.105.1 Detailed Description	205
6.105.2 Member Function Documentation	205
6.105.2.1 operator AlgFactory *	205
6.105.2.2 operator AttributeFactory *	205
6.105.2.3 operator FnFactory *	205
6.106 ArcSec::EvaluatorLoader Class Reference	206
6.106.1 Detailed Description	206
6.106.2 Member Function Documentation	206

6.106.2.1	getEvaluator	206
6.106.2.2	getEvaluator	206
6.106.2.3	getEvaluator	206
6.106.2.4	getPolicy	206
6.106.2.5	getPolicy	206
6.106.2.6	getRequest	207
6.106.2.7	getRequest	207
6.107	Arc::ExecutableType Class Reference	208
6.108	Arc::ExecutionTarget Class Reference	209
6.108.1	Detailed Description	209
6.108.2	Field Documentation	209
6.108.2.1	ApplicationEnvironments	209
6.108.2.2	MaxDiskSpace	209
6.108.2.3	MaxMainMemory	209
6.108.2.4	MaxVirtualMemory	209
6.108.2.5	OperatingSystem	209
6.109	Arc::ExpirationReminder Class Reference	211
6.109.1	Detailed Description	211
6.109.2	Member Function Documentation	211
6.109.2.1	getExpiryTime	211
6.109.2.2	getReservationID	211
6.109.2.3	operator<	211
6.110	Arc::FileCache Class Reference	212
6.110.1	Detailed Description	212
6.110.2	Constructor & Destructor Documentation	213
6.110.2.1	FileCache	213
6.110.2.2	FileCache	213
6.110.2.3	FileCache	213
6.110.2.4	FileCache	213
6.110.2.5	~FileCache	213
6.110.3	Member Function Documentation	214
6.110.3.1	AddDN	214
6.110.3.2	CheckCreated	214
6.110.3.3	CheckDN	214
6.110.3.4	CheckValid	214
6.110.3.5	Clean	214

6.110.3.6 Copy	214
6.110.3.7 File	215
6.110.3.8 GetCreated	215
6.110.3.9 GetValid	215
6.110.3.10 Link	215
6.110.3.11 operator bool	215
6.110.3.12 operator==	215
6.110.3.13 Release	215
6.110.3.14 SetValid	216
6.110.3.15 Start	216
6.110.3.16 Stop	216
6.110.3.17 StopAndDelete	216
6.111 FileCacheHash Class Reference	217
6.111.1 Detailed Description	217
6.111.2 Member Function Documentation	217
6.111.2.1 getHash	217
6.111.2.2 maxLength	217
6.112 Arc::FileInfo Class Reference	218
6.112.1 Detailed Description	218
6.113 Arc::FileLock Class Reference	219
6.114 Arc::FileType Class Reference	220
6.115 Arc::FinderLoader Class Reference	221
6.116 ArcSec::FnFactory Class Reference	222
6.116.1 Detailed Description	222
6.116.2 Member Function Documentation	222
6.116.2.1 createFn	222
6.117 ArcSec::Function Class Reference	223
6.117.1 Detailed Description	223
6.117.2 Member Function Documentation	223
6.117.2.1 evaluate	223
6.117.2.2 evaluate	223
6.118 ArcSec::GenericAttribute Class Reference	224
6.118.1 Member Function Documentation	224
6.118.1.1 encode	224
6.118.1.2 getId	224
6.118.1.3 getType	224

6.119Arc::GlobusResult Class Reference	225
6.120Arc::GSSCredential Class Reference	226
6.121Arc::HakaClient Class Reference	227
6.121.1 Member Function Documentation	227
6.121.1.1 processConsent	227
6.121.1.2 processIdP2Confusa	227
6.121.1.3 processIdPLogin	227
6.122Arc::HTTPClientInfo Struct Reference	228
6.123Arc::InfoCache Class Reference	229
6.123.1 Detailed Description	229
6.123.2 Constructor & Destructor Documentation	229
6.123.2.1 InfoCache	229
6.124Arc::InfoCacheInterface Class Reference	230
6.124.1 Member Function Documentation	230
6.124.1.1 Get	230
6.125Arc::InfoFilter Class Reference	231
6.125.1 Detailed Description	231
6.125.2 Constructor & Destructor Documentation	231
6.125.2.1 InfoFilter	231
6.125.3 Member Function Documentation	231
6.125.3.1 Filter	231
6.125.3.2 Filter	231
6.126Arc::InfoRegister Class Reference	232
6.126.1 Detailed Description	232
6.127Arc::InfoRegisterContainer Class Reference	233
6.127.1 Detailed Description	233
6.127.2 Member Function Documentation	233
6.127.2.1 addRegistrars	233
6.127.2.2 addService	233
6.127.2.3 removeService	233
6.128Arc::InfoRegisters Class Reference	234
6.128.1 Detailed Description	234
6.128.2 Constructor & Destructor Documentation	234
6.128.2.1 InfoRegisters	234
6.129Arc::InfoRegistrar Class Reference	235
6.129.1 Detailed Description	235

6.129.2 Member Function Documentation	235
6.129.2.1 addService	235
6.129.2.2 registration	235
6.130Arc::InformationContainer Class Reference	236
6.130.1 Detailed Description	236
6.130.2 Constructor & Destructor Documentation	236
6.130.2.1 InformationContainer	236
6.130.3 Member Function Documentation	236
6.130.3.1 Acquire	236
6.130.3.2 Assign	236
6.130.3.3 Get	237
6.130.4 Field Documentation	237
6.130.4.1 doc_	237
6.131Arc::InformationInterface Class Reference	238
6.131.1 Detailed Description	238
6.131.2 Constructor & Destructor Documentation	238
6.131.2.1 InformationInterface	238
6.131.3 Member Function Documentation	238
6.131.3.1 Get	238
6.131.4 Field Documentation	239
6.131.4.1 lock_	239
6.132Arc::InformationRequest Class Reference	240
6.132.1 Detailed Description	240
6.132.2 Constructor & Destructor Documentation	240
6.132.2.1 InformationRequest	240
6.132.2.2 InformationRequest	240
6.132.2.3 InformationRequest	240
6.132.2.4 InformationRequest	240
6.132.3 Member Function Documentation	240
6.132.3.1 SOAP	240
6.133Arc::InformationResponse Class Reference	241
6.133.1 Detailed Description	241
6.133.2 Constructor & Destructor Documentation	241
6.133.2.1 InformationResponse	241
6.133.3 Member Function Documentation	241
6.133.3.1 Result	241

6.134Arc::IniConfig Class Reference	242
6.135ArcSec::InRangeFunction Class Reference	243
6.135.1 Member Function Documentation	243
6.135.1.1 evaluate	243
6.135.1.2 evaluate	243
6.136Arc::IntraProcessCounter Class Reference	244
6.136.1 Detailed Description	244
6.136.2 Constructor & Destructor Documentation	244
6.136.2.1 IntraProcessCounter	244
6.136.2.2 ~IntraProcessCounter	245
6.136.3 Member Function Documentation	245
6.136.3.1 cancel	245
6.136.3.2 changeExcess	245
6.136.3.3 changeLimit	245
6.136.3.4 extend	245
6.136.3.5 getExcess	246
6.136.3.6 getLimit	246
6.136.3.7 getValue	246
6.136.3.8 reserve	246
6.136.3.9 setExcess	247
6.136.3.10setLimit	247
6.137Arc::ISIS_description Struct Reference	248
6.138Arc::IString Class Reference	249
6.139Arc::JDLParser Class Reference	250
6.140Arc::Job Class Reference	251
6.141Arc::JobController Class Reference	252
6.141.1 Detailed Description	252
6.142Arc::JobControllerLoader Class Reference	253
6.142.1 Detailed Description	253
6.142.2 Constructor & Destructor Documentation	253
6.142.2.1 JobControllerLoader	253
6.142.2.2 ~JobControllerLoader	253
6.142.3 Member Function Documentation	253
6.142.3.1 GetJobControllers	253
6.142.3.2 load	253
6.143Arc::JobControllerPluginArgument Class Reference	255

6.144Arc::JobDescription Class Reference	256
6.145Arc::JobDescriptionParser Class Reference	257
6.146Arc::JobIdentificationType Class Reference	258
6.147Arc::JobMetaType Class Reference	259
6.148Arc::JobState Class Reference	260
6.148.1 Detailed Description	260
6.149Arc::JobSupervisor Class Reference	261
6.150Arc::LoadableModuleDescription Class Reference	262
6.151Arc::Loader Class Reference	263
6.151.1 Detailed Description	263
6.151.2 Constructor & Destructor Documentation	263
6.151.2.1 Loader	263
6.151.2.2 ~Loader	263
6.151.3 Field Documentation	263
6.151.3.1 factory_	263
6.152Arc::LogDestination Class Reference	264
6.152.1 Detailed Description	264
6.152.2 Constructor & Destructor Documentation	264
6.152.2.1 LogDestination	264
6.152.2.2 LogDestination	264
6.153Arc::Logger Class Reference	265
6.153.1 Detailed Description	265
6.153.2 Constructor & Destructor Documentation	265
6.153.2.1 Logger	265
6.153.2.2 Logger	266
6.153.2.3 ~Logger	266
6.153.3 Member Function Documentation	266
6.153.3.1 addDestination	266
6.153.3.2 getRootLogger	266
6.153.3.3 getThreshold	266
6.153.3.4 msg	266
6.153.3.5 msg	267
6.153.3.6 setThreshold	267
6.154Arc::LogMessage Class Reference	268
6.154.1 Detailed Description	268
6.154.2 Constructor & Destructor Documentation	268

6.154.2.1	LogMessage	268
6.154.2.2	LogMessage	268
6.154.3	Member Function Documentation	269
6.154.3.1	getLevel	269
6.154.3.2	setIdentifier	269
6.154.4	Friends And Related Function Documentation	269
6.154.4.1	Logger	269
6.154.4.2	operator<<	269
6.155	Arc::LogStream Class Reference	270
6.155.1	Detailed Description	270
6.155.2	Constructor & Destructor Documentation	270
6.155.2.1	LogStream	270
6.155.2.2	LogStream	270
6.155.3	Member Function Documentation	270
6.155.3.1	log	270
6.156	ArcSec::MatchFunction Class Reference	272
6.156.1	Detailed Description	272
6.156.2	Member Function Documentation	272
6.156.2.1	evaluate	272
6.156.2.2	evaluate	272
6.156.2.3	getFunctionName	272
6.157	Arc::MCC Class Reference	274
6.157.1	Detailed Description	274
6.157.2	Constructor & Destructor Documentation	275
6.157.2.1	MCC	275
6.157.3	Member Function Documentation	275
6.157.3.1	AddSecHandler	275
6.157.3.2	Next	275
6.157.3.3	process	275
6.157.3.4	ProcessSecHandlers	275
6.157.3.5	Unlink	275
6.157.4	Field Documentation	276
6.157.4.1	logger	276
6.157.4.2	next_	276
6.157.4.3	sechandlers_	276
6.158	Arc::MCC_Status Class Reference	277

6.158.1 Detailed Description	277
6.158.2 Constructor & Destructor Documentation	277
6.158.2.1 MCC_Status	277
6.158.3 Member Function Documentation	277
6.158.3.1 getExplanation	277
6.158.3.2 getKind	278
6.158.3.3 getOrigin	278
6.158.3.4 isOk	278
6.158.3.5 operator bool	278
6.158.3.6 operator std::string	278
6.158.3.7 operator!	278
6.159 Arc::MCCConfig Class Reference	279
6.159.1 Member Function Documentation	279
6.159.1.1 MakeConfig	279
6.160 Arc::MCCInterface Class Reference	280
6.160.1 Detailed Description	280
6.160.2 Member Function Documentation	280
6.160.2.1 process	280
6.161 Arc::MCCLoader Class Reference	281
6.161.1 Detailed Description	281
6.161.2 Constructor & Destructor Documentation	281
6.161.2.1 MCCLoader	281
6.161.2.2 ~MCCLoader	281
6.161.3 Member Function Documentation	281
6.161.3.1 operator[]	281
6.162 Arc::MCCPluginArgument Class Reference	283
6.163 Arc::MD5Sum Class Reference	284
6.163.1 Detailed Description	284
6.164 Arc::MemoryAllocationException Class Reference	285
6.165 Arc::Message Class Reference	286
6.165.1 Detailed Description	286
6.165.2 Constructor & Destructor Documentation	287
6.165.2.1 Message	287
6.165.2.2 Message	287
6.165.2.3 Message	287
6.165.2.4 ~Message	287

6.165.3 Member Function Documentation	287
6.165.3.1 Attributes	287
6.165.3.2 Auth	287
6.165.3.3 AuthContext	287
6.165.3.4 AuthContext	287
6.165.3.5 Context	287
6.165.3.6 Context	288
6.165.3.7 operator=	288
6.165.3.8 Payload	288
6.165.3.9 Payload	288
6.166Arc::MessageAttributes Class Reference	289
6.166.1 Detailed Description	289
6.166.2 Constructor & Destructor Documentation	289
6.166.2.1 MessageAttributes	289
6.166.3 Member Function Documentation	290
6.166.3.1 add	290
6.166.3.2 count	290
6.166.3.3 get	290
6.166.3.4 getAll	290
6.166.3.5 remove	291
6.166.3.6 removeAll	291
6.166.3.7 set	291
6.166.4 Field Documentation	291
6.166.4.1 attributes_	291
6.167Arc::MessageAuth Class Reference	292
6.167.1 Detailed Description	292
6.167.2 Member Function Documentation	292
6.167.2.1 Export	292
6.167.2.2 Filter	292
6.168Arc::MessageAuthContext Class Reference	293
6.168.1 Detailed Description	293
6.169Arc::MessageContext Class Reference	294
6.169.1 Detailed Description	294
6.169.2 Member Function Documentation	294
6.169.2.1 Add	294
6.170Arc::MessageContextElement Class Reference	295

6.170.1 Detailed Description	295
6.171Arc::MessagePayload Class Reference	296
6.171.1 Detailed Description	296
6.172Arc::ModuleManager Class Reference	297
6.172.1 Detailed Description	297
6.172.2 Constructor & Destructor Documentation	297
6.172.2.1 ModuleManager	297
6.172.3 Member Function Documentation	297
6.172.3.1 findLocation	297
6.172.3.2 load	298
6.172.3.3 makePersistent	298
6.172.3.4 makePersistent	298
6.172.3.5 reload	298
6.172.3.6 setCfg	298
6.172.3.7 unload	298
6.172.3.8 unload	298
6.173Arc::MultiSecAttr Class Reference	299
6.173.1 Detailed Description	299
6.173.2 Member Function Documentation	299
6.173.2.1 Export	299
6.173.2.2 operator bool	299
6.174Arc::MySQLDatabase Class Reference	300
6.174.1 Detailed Description	300
6.174.2 Member Function Documentation	300
6.174.2.1 close	300
6.174.2.2 connect	300
6.174.2.3 enable_ssl	300
6.174.2.4 isconnected	301
6.174.2.5 shutdown	301
6.175Arc::MySQLQuery Class Reference	302
6.175.1 Member Function Documentation	302
6.175.1.1 execute	302
6.175.1.2 get_array	302
6.175.1.3 get_num_columns	302
6.175.1.4 get_num_rows	303
6.175.1.5 get_row	303

6.175.1.6	get_row	303
6.175.1.7	get_row_field	303
6.176	Arc::NS Class Reference	304
6.177	Arc::OAuthConsumer Class Reference	305
6.177.1	Detailed Description	305
6.177.2	Constructor & Destructor Documentation	305
6.177.2.1	OAuthConsumer	305
6.177.3	Member Function Documentation	305
6.177.3.1	approveCSR	305
6.177.3.2	parseDN	306
6.177.3.3	processLogin	306
6.177.3.4	pushCSR	306
6.177.3.5	storeCert	306
6.178	Arc::OpenIdpClient Class Reference	307
6.178.1	Member Function Documentation	307
6.178.1.1	processConsent	307
6.178.1.2	processIdP2Confusa	307
6.178.1.3	processIdPLogin	307
6.179	Arc::OptionParser Class Reference	308
6.180	ArcSec::OrderedCombiningAlg Class Reference	309
6.181	passwd Struct Reference	310
6.182	Arc::PathIterator Class Reference	311
6.182.1	Detailed Description	311
6.182.2	Constructor & Destructor Documentation	311
6.182.2.1	PathIterator	311
6.182.3	Member Function Documentation	311
6.182.3.1	operator bool	311
6.182.3.2	operator*	311
6.182.3.3	operator++	311
6.182.3.4	operator--	311
6.182.3.5	Rest	312
6.183	Arc::PayloadRaw Class Reference	313
6.183.1	Detailed Description	313
6.183.2	Constructor & Destructor Documentation	313
6.183.2.1	PayloadRaw	313
6.183.2.2	~PayloadRaw	313

6.183.3 Member Function Documentation	313
6.183.3.1 Buffer	313
6.183.3.2 BufferPos	314
6.183.3.3 BufferSize	314
6.183.3.4 Content	314
6.183.3.5 Insert	314
6.183.3.6 Insert	314
6.183.3.7 operator[]	314
6.183.3.8 Size	314
6.183.3.9 Truncate	314
6.184Arc::PayloadRawBuf Struct Reference	316
6.184.1 Field Documentation	316
6.184.1.1 allocated	316
6.184.1.2 length	316
6.184.1.3 size	316
6.185Arc::PayloadRawInterface Class Reference	317
6.185.1 Detailed Description	317
6.185.2 Member Function Documentation	317
6.185.2.1 Buffer	317
6.185.2.2 BufferPos	317
6.185.2.3 BufferSize	318
6.185.2.4 Content	318
6.185.2.5 Insert	318
6.185.2.6 Insert	318
6.185.2.7 operator[]	318
6.185.2.8 Size	318
6.185.2.9 Truncate	318
6.186Arc::PayloadSOAP Class Reference	319
6.186.1 Detailed Description	319
6.186.2 Constructor & Destructor Documentation	319
6.186.2.1 PayloadSOAP	319
6.186.2.2 PayloadSOAP	319
6.186.2.3 PayloadSOAP	319
6.187Arc::PayloadStream Class Reference	320
6.187.1 Detailed Description	320
6.187.2 Constructor & Destructor Documentation	320

6.187.2.1 PayloadStream	320
6.187.2.2 ~PayloadStream	321
6.187.3 Member Function Documentation	321
6.187.3.1 Get	321
6.187.3.2 Get	321
6.187.3.3 Get	321
6.187.3.4 operator bool	321
6.187.3.5 operator!	321
6.187.3.6 Pos	321
6.187.3.7 Put	321
6.187.3.8 Put	322
6.187.3.9 Put	322
6.187.3.10Size	322
6.187.3.11Timeout	322
6.187.3.12Timeout	322
6.187.4 Field Documentation	322
6.187.4.1 handle_	322
6.187.4.2 seekable_	322
6.188Arc::PayloadStreamInterface Class Reference	324
6.188.1 Detailed Description	324
6.188.2 Member Function Documentation	324
6.188.2.1 Get	324
6.188.2.2 Get	324
6.188.2.3 Get	325
6.188.2.4 operator bool	325
6.188.2.5 operator!	325
6.188.2.6 Pos	325
6.188.2.7 Put	325
6.188.2.8 Put	325
6.188.2.9 Put	325
6.188.2.10Size	325
6.188.2.11Timeout	326
6.188.2.12Timeout	326
6.189Arc::PayloadWSRF Class Reference	327
6.189.1 Detailed Description	327
6.189.2 Constructor & Destructor Documentation	327

6.189.2.1 PayloadWSRF	327
6.189.2.2 PayloadWSRF	327
6.189.2.3 PayloadWSRF	327
6.190ArcSec::PDP Class Reference	328
6.190.1 Detailed Description	328
6.191ArcSec::PDPCfgContext Class Reference	329
6.192ArcSec::PDPPluginArgument Class Reference	330
6.193Arc::Period Class Reference	331
6.193.1 Constructor & Destructor Documentation	331
6.193.1.1 Period	331
6.193.1.2 Period	331
6.193.1.3 Period	331
6.193.2 Member Function Documentation	331
6.193.2.1 GetPeriod	331
6.193.2.2 istr	331
6.193.2.3 operator std::string	331
6.193.2.4 operator!=	332
6.193.2.5 operator<	332
6.193.2.6 operator<=	332
6.193.2.7 operator=	332
6.193.2.8 operator=	332
6.193.2.9 operator==	332
6.193.2.10operator>	332
6.193.2.11operator>=	332
6.193.2.12SetPeriod	332
6.194ArcSec::PeriodAttribute Class Reference	333
6.194.1 Detailed Description	333
6.194.2 Member Function Documentation	333
6.194.2.1 encode	333
6.194.2.2 getId	333
6.194.2.3 getType	333
6.195ArcSec::PermitOverridesCombiningAlg Class Reference	334
6.195.1 Detailed Description	334
6.195.2 Member Function Documentation	334
6.195.2.1 combine	334
6.195.2.2 getalgId	334

6.196Arc::Plexer Class Reference	336
6.196.1 Detailed Description	336
6.196.2 Constructor & Destructor Documentation	336
6.196.2.1 Plexer	336
6.196.2.2 ~Plexer	336
6.196.3 Member Function Documentation	337
6.196.3.1 Next	337
6.196.3.2 process	337
6.196.4 Field Documentation	337
6.196.4.1 logger	337
6.197Arc::PlexerEntry Class Reference	338
6.197.1 Detailed Description	338
6.198Arc::Plugin Class Reference	339
6.198.1 Detailed Description	339
6.199Arc::PluginArgument Class Reference	340
6.199.1 Detailed Description	340
6.199.2 Member Function Documentation	340
6.199.2.1 get_factory	340
6.199.2.2 get_module	341
6.200Arc::PluginDescriptor Struct Reference	342
6.200.1 Detailed Description	342
6.201Arc::PluginsFactory Class Reference	343
6.201.1 Detailed Description	343
6.201.2 Constructor & Destructor Documentation	343
6.201.2.1 PluginsFactory	343
6.201.3 Member Function Documentation	343
6.201.3.1 get_instance	343
6.201.3.2 load	343
6.202ArcSec::Policy Class Reference	345
6.202.1 Detailed Description	345
6.202.2 Constructor & Destructor Documentation	345
6.202.2.1 Policy	345
6.202.2.2 Policy	346
6.202.3 Member Function Documentation	346
6.202.3.1 addPolicy	346
6.202.3.2 eval	346

6.202.3.3	getEffect	346
6.202.3.4	getEvalName	346
6.202.3.5	getEvalResult	346
6.202.3.6	getName	346
6.202.3.7	make_policy	346
6.202.3.8	setEvalResult	346
6.202.3.9	setEvaluatorContext	347
6.203	ArcSec::PolicyStore::PolicyElement Class Reference	348
6.204	ArcSec::PolicyParser Class Reference	349
6.204.1	Detailed Description	349
6.204.2	Member Function Documentation	349
6.204.2.1	parsePolicy	349
6.205	ArcSec::PolicyStore Class Reference	350
6.205.1	Detailed Description	350
6.205.2	Constructor & Destructor Documentation	350
6.205.2.1	PolicyStore	350
6.206	Arc::Printf< T0, T1, T2, T3, T4, T5, T6, T7 > Class Template Reference	351
6.207	Arc::PrintFBase Class Reference	352
6.208	Arc::Profile Class Reference	353
6.209	ArcCredential::PROXYCERTINFO_st Struct Reference	354
6.210	ArcCredential::PROXYPOLICY_st Struct Reference	355
6.211	Arc::Query Class Reference	356
6.211.1	Constructor & Destructor Documentation	356
6.211.1.1	Query	356
6.211.1.2	Query	356
6.211.1.3	~Query	356
6.211.2	Member Function Documentation	356
6.211.2.1	execute	356
6.211.2.2	get_array	357
6.211.2.3	get_num_columns	357
6.211.2.4	get_num_rows	357
6.211.2.5	get_row	357
6.211.2.6	get_row	357
6.211.2.7	get_row_field	358
6.212	Arc::Range< T > Class Template Reference	359
6.213	Arc::Register_Info_Type Struct Reference	360

6.214Arc::RegisteredService Class Reference	361
6.214.1 Detailed Description	361
6.214.2 Constructor & Destructor Documentation	361
6.214.2.1 RegisteredService	361
6.215Arc::RegularExpression Class Reference	362
6.215.1 Detailed Description	362
6.215.2 Member Function Documentation	362
6.215.2.1 match	362
6.216ArcSec::Request Class Reference	363
6.216.1 Detailed Description	363
6.216.2 Constructor & Destructor Documentation	363
6.216.2.1 Request	363
6.216.2.2 Request	363
6.216.3 Member Function Documentation	364
6.216.3.1 addRequestItem	364
6.216.3.2 getEvalName	364
6.216.3.3 getName	364
6.216.3.4 getRequestItems	364
6.216.3.5 make_request	364
6.216.3.6 setAttributeFactory	364
6.216.3.7 setRequestItems	364
6.217ArcSec::RequestAttribute Class Reference	365
6.217.1 Detailed Description	365
6.217.2 Constructor & Destructor Documentation	365
6.217.2.1 RequestAttribute	365
6.217.3 Member Function Documentation	365
6.217.3.1 duplicate	365
6.218ArcSec::RequestItem Class Reference	366
6.218.1 Detailed Description	366
6.218.2 Constructor & Destructor Documentation	366
6.218.2.1 RequestItem	366
6.219ArcSec::RequestTuple Class Reference	367
6.220Arc::ResourceSlotType Class Reference	368
6.221Arc::ResourcesType Class Reference	369
6.222Arc::ResourceTargetType Class Reference	370
6.223ArcSec::Response Class Reference	371

6.223.1 Detailed Description	371
6.224ArcSec::ResponseItem Class Reference	372
6.224.1 Detailed Description	372
6.225ArcSec::ResponseList Class Reference	373
6.226Arc::RSL Class Reference	374
6.227Arc::RSLBoolean Class Reference	375
6.228Arc::RSLConcat Class Reference	376
6.229Arc::RSLCondition Class Reference	377
6.230Arc::RSLList Class Reference	378
6.231Arc::RSLLiteral Class Reference	379
6.232Arc::RSLParser Class Reference	380
6.233Arc::RSLSequence Class Reference	381
6.234Arc::RSLValue Class Reference	382
6.235Arc::RSLVariable Class Reference	383
6.236Arc::Run Class Reference	384
6.236.1 Detailed Description	384
6.236.2 Constructor & Destructor Documentation	384
6.236.2.1 Run	384
6.236.2.2 Run	384
6.236.2.3 ~Run	384
6.236.3 Member Function Documentation	385
6.236.3.1 AssignStderr	385
6.236.3.2 AssignStdin	385
6.236.3.3 AssignStdout	385
6.236.3.4 AssignWorkingDirectory	385
6.236.3.5 CloseStderr	385
6.236.3.6 CloseStdin	385
6.236.3.7 CloseStdout	385
6.236.3.8 KeepStderr	385
6.236.3.9 KeepStdin	385
6.236.3.10KeepStdout	385
6.236.3.11Kill	386
6.236.3.12operator bool	386
6.236.3.13operator!	386
6.236.3.14ReadStderr	386
6.236.3.15ReadStdout	386

6.236.3.16	Result	386
6.236.3.17	Running	386
6.236.3.18	Start	386
6.236.3.19	Wait	386
6.236.3.20	Wait	386
6.236.3.21	WriteStdin	387
6.237	Arc::SAML2LoginClient Class Reference	388
6.237.1	Constructor & Destructor Documentation	388
6.237.1.1	SAML2LoginClient	388
6.237.2	Member Function Documentation	388
6.237.2.1	findSimpleSAMLInstallation	388
6.237.2.2	processLogin	388
6.238	Arc::SAML2SSOHTTPClient Class Reference	389
6.238.1	Member Function Documentation	389
6.238.1.1	approveCSR	389
6.238.1.2	parseDN	389
6.238.1.3	processConsent	389
6.238.1.4	processIdP2Confusa	390
6.238.1.5	processIdPLogin	390
6.238.1.6	processLogin	390
6.238.1.7	pushCSR	390
6.238.1.8	storeCert	390
6.239	Arc::SAMLToken Class Reference	391
6.239.1	Detailed Description	391
6.239.2	Member Enumeration Documentation	392
6.239.2.1	SAMLVersion	392
6.239.3	Constructor & Destructor Documentation	392
6.239.3.1	SAMLToken	392
6.239.3.2	SAMLToken	392
6.239.3.3	~SAMLToken	393
6.239.4	Member Function Documentation	393
6.239.4.1	Authenticate	393
6.239.4.2	Authenticate	393
6.239.4.3	operator bool	393
6.240	Arc::ScalableTime< T > Class Template Reference	394
6.241	Arc::SecAttr Class Reference	395

6.241.1 Detailed Description	395
6.241.2 Member Function Documentation	395
6.241.2.1 Export	395
6.241.2.2 Export	396
6.241.2.3 Import	396
6.241.2.4 operator bool	396
6.241.2.5 operator!=	396
6.241.2.6 operator==	396
6.242 Arc::SecAttrFormat Class Reference	397
6.242.1 Detailed Description	397
6.243 Arc::SecAttrValue Class Reference	398
6.243.1 Detailed Description	398
6.243.2 Member Function Documentation	398
6.243.2.1 operator bool	398
6.243.2.2 operator!=	398
6.243.2.3 operator==	398
6.244 ArcSec::SecHandler Class Reference	399
6.244.1 Detailed Description	399
6.245 ArcSec::SecHandlerConfig Class Reference	400
6.245.1 Detailed Description	400
6.246 Arc::SecHandlerConfig Class Reference	401
6.247 ArcSec::SecHandlerPluginArgument Class Reference	402
6.248 ArcSec::Security Class Reference	403
6.248.1 Detailed Description	403
6.249 Arc::Service Class Reference	404
6.249.1 Detailed Description	404
6.249.2 Constructor & Destructor Documentation	405
6.249.2.1 Service	405
6.249.3 Member Function Documentation	405
6.249.3.1 AddSecHandler	405
6.249.3.2 getID	405
6.249.3.3 ProcessSecHandlers	405
6.249.3.4 RegistrationCollector	405
6.249.4 Field Documentation	405
6.249.4.1 logger	405
6.249.4.2 sechandlers_	405

6.250Arc::ServicePluginArgument Class Reference	407
6.251Arc::SimpleCondition Class Reference	408
6.251.1 Detailed Description	408
6.251.2 Member Function Documentation	408
6.251.2.1 broadcast	408
6.251.2.2 lock	408
6.251.2.3 reset	408
6.251.2.4 signal	408
6.251.2.5 signal_nonblock	408
6.251.2.6 unlock	409
6.251.2.7 wait	409
6.251.2.8 wait	409
6.251.2.9 wait_nonblock	409
6.252Arc::SOAPMessage Class Reference	410
6.252.1 Detailed Description	410
6.252.2 Constructor & Destructor Documentation	410
6.252.2.1 SOAPMessage	410
6.252.2.2 SOAPMessage	410
6.252.2.3 SOAPMessage	410
6.252.2.4 ~SOAPMessage	410
6.252.3 Member Function Documentation	410
6.252.3.1 Attributes	410
6.252.3.2 Payload	411
6.252.3.3 Payload	411
6.253Arc::Software Class Reference	412
6.253.1 Detailed Description	412
6.253.2 Member Enumeration Documentation	412
6.253.2.1 ComparisonOperator	412
6.253.3 Constructor & Destructor Documentation	413
6.253.3.1 Software	413
6.253.4 Member Function Documentation	413
6.253.4.1 operator==	413
6.254Arc::SoftwareRequirement Class Reference	414
6.254.1 Member Function Documentation	414
6.254.1.1 add	414
6.254.1.2 isSatisfied	414

6.254.1.3 setRequirement	414
6.255ArcSec::Source Class Reference	415
6.255.1 Detailed Description	415
6.255.2 Constructor & Destructor Documentation	415
6.255.2.1 Source	415
6.255.2.2 Source	415
6.256ArcSec::SourceFile Class Reference	416
6.256.1 Detailed Description	416
6.257ArcSec::SourceURL Class Reference	417
6.257.1 Detailed Description	417
6.258ArcSec::StringAttribute Class Reference	418
6.258.1 Member Function Documentation	418
6.258.1.1 encode	418
6.258.1.2 getId	418
6.258.1.3 getType	418
6.259Arc::Submitter Class Reference	419
6.259.1 Detailed Description	419
6.260Arc::SubmitterLoader Class Reference	420
6.260.1 Detailed Description	420
6.260.2 Constructor & Destructor Documentation	420
6.260.2.1 SubmitterLoader	420
6.260.2.2 ~SubmitterLoader	420
6.260.3 Member Function Documentation	420
6.260.3.1 GetSubmitters	420
6.260.3.2 load	420
6.261Arc::SubmitterPluginArgument Class Reference	422
6.262Arc::TargetGenerator Class Reference	423
6.263Arc::TargetRetriever Class Reference	424
6.263.1 Detailed Description	424
6.264Arc::TargetRetrieverLoader Class Reference	425
6.264.1 Detailed Description	425
6.264.2 Constructor & Destructor Documentation	425
6.264.2.1 TargetRetrieverLoader	425
6.264.2.2 ~TargetRetrieverLoader	425
6.264.3 Member Function Documentation	425
6.264.3.1 GetTargetRetrievers	425

6.264.3.2 load	426
6.265Arc::TargetRetrieverPluginArgument Class Reference	427
6.266Test::TestMCC Class Reference	428
6.267Test::TestService Class Reference	429
6.267.1 Member Function Documentation	429
6.267.1.1 process	429
6.268Arc::ThreadInitializer Class Reference	430
6.269Arc::Time Class Reference	431
6.269.1 Detailed Description	431
6.269.2 Constructor & Destructor Documentation	431
6.269.2.1 Time	431
6.269.2.2 Time	431
6.269.2.3 Time	432
6.269.3 Member Function Documentation	432
6.269.3.1 GetFormat	432
6.269.3.2 GetTime	432
6.269.3.3 operator std::string	432
6.269.3.4 operator!=	432
6.269.3.5 operator+	432
6.269.3.6 operator-	432
6.269.3.7 operator-	432
6.269.3.8 operator<	432
6.269.3.9 operator<=	432
6.269.3.10operator=	432
6.269.3.11operator=	433
6.269.3.12operator=	433
6.269.3.13operator=	433
6.269.3.14operator==	433
6.269.3.15operator>	433
6.269.3.16operator>=	433
6.269.3.17SetFormat	433
6.269.3.18SetTime	433
6.269.3.19str	433
6.270ArcSec::TimeAttribute Class Reference	434
6.270.1 Detailed Description	434
6.270.2 Member Function Documentation	434

6.270.2.1 encode	434
6.270.2.2 getId	434
6.270.2.3 getType	434
6.271Arc::URL Class Reference	435
6.271.1 Member Enumeration Documentation	436
6.271.1.1 Scope	436
6.271.2 Constructor & Destructor Documentation	436
6.271.2.1 URL	436
6.271.2.2 URL	437
6.271.2.3 ~URL	437
6.271.3 Member Function Documentation	437
6.271.3.1 AddLDAPAttribute	437
6.271.3.2 AddOption	437
6.271.3.3 BaseDN2Path	437
6.271.3.4 ChangeHost	437
6.271.3.5 ChangeLDAPFilter	437
6.271.3.6 ChangeLDAPScope	437
6.271.3.7 ChangePath	437
6.271.3.8 ChangePort	437
6.271.3.9 ChangeProtocol	437
6.271.3.10CommonLocOption	438
6.271.3.11CommonLocOptions	438
6.271.3.12ConnectionURL	438
6.271.3.13FullPath	438
6.271.3.14fullstr	438
6.271.3.15Host	438
6.271.3.16HTTPOption	438
6.271.3.17HTTPOptions	438
6.271.3.18LDAPAttributes	438
6.271.3.19LDAPFilter	439
6.271.3.20LDAPScope	439
6.271.3.21Locations	439
6.271.3.22MetaDataOption	439
6.271.3.23MetaDataOptions	439
6.271.3.24operator bool	439
6.271.3.25operator<	439

6.271.3.26	operator==	439
6.271.3.27	Option	439
6.271.3.28	Options	440
6.271.3.29	OptionString	440
6.271.3.30	ParseOptions	440
6.271.3.31	Passwd	440
6.271.3.32	Path	440
6.271.3.33	Path2BaseDN	440
6.271.3.34	Port	440
6.271.3.35	Protocol	440
6.271.3.36	str	440
6.271.3.37	Username	440
6.271.4	Friends And Related Function Documentation	441
6.271.4.1	operator<<	441
6.271.5	Field Documentation	441
6.271.5.1	commonloptions	441
6.271.5.2	host	441
6.271.5.3	htptoptions	441
6.271.5.4	ldapattributes	441
6.271.5.5	ldapfilter	441
6.271.5.6	ldapscope	441
6.271.5.7	locations	441
6.271.5.8	metadataoptions	441
6.271.5.9	passwd	441
6.271.5.10	path	441
6.271.5.11	lport	442
6.271.5.12	protocol	442
6.271.5.13	urloptions	442
6.271.5.14	username	442
6.271.5.15	valid	442
6.272	Arc::URLLocation Class Reference	443
6.272.1	Detailed Description	443
6.272.2	Constructor & Destructor Documentation	443
6.272.2.1	URLLocation	443
6.272.2.2	URLLocation	443
6.272.2.3	URLLocation	443

6.272.2.4 URLLocation	444
6.272.2.5 URLLocation	444
6.272.2.6 ~URLLocation	444
6.272.3 Member Function Documentation	444
6.272.3.1 fullstr	444
6.272.3.2 Name	444
6.272.3.3 str	444
6.272.4 Field Documentation	444
6.272.4.1 name	444
6.273Arc::URLMap Class Reference	445
6.274Arc::User Class Reference	446
6.275Arc::UserConfig Class Reference	447
6.276Arc::UsernameToken Class Reference	448
6.276.1 Detailed Description	448
6.276.2 Member Enumeration Documentation	448
6.276.2.1 PasswordType	448
6.276.3 Constructor & Destructor Documentation	448
6.276.3.1 UsernameToken	448
6.276.3.2 UsernameToken	448
6.276.3.3 UsernameToken	449
6.276.4 Member Function Documentation	449
6.276.4.1 Authenticate	449
6.276.4.2 Authenticate	449
6.276.4.3 operator bool	449
6.276.4.4 Username	449
6.277Arc::UserSwitch Class Reference	450
6.277.1 Detailed Description	450
6.278Arc::VOMSTrustList Class Reference	451
6.278.1 Detailed Description	451
6.278.2 Constructor & Destructor Documentation	451
6.278.2.1 VOMSTrustList	451
6.278.2.2 VOMSTrustList	451
6.278.3 Member Function Documentation	452
6.278.3.1 AddChain	452
6.278.3.2 AddChain	452
6.278.3.3 AddRegex	452

6.279Arc::WSAEndpointReference Class Reference	453
6.279.1 Detailed Description	453
6.279.2 Constructor & Destructor Documentation	453
6.279.2.1 WSAEndpointReference	453
6.279.2.2 WSAEndpointReference	453
6.279.2.3 WSAEndpointReference	453
6.279.2.4 WSAEndpointReference	453
6.279.2.5 ~WSAEndpointReference	453
6.279.3 Member Function Documentation	454
6.279.3.1 Address	454
6.279.3.2 Address	454
6.279.3.3 MetaData	454
6.279.3.4 operator XMLNode	454
6.279.3.5 operator=	454
6.279.3.6 ReferenceParameters	454
6.280Arc::WSAHeader Class Reference	455
6.280.1 Detailed Description	455
6.280.2 Constructor & Destructor Documentation	455
6.280.2.1 WSAHeader	455
6.280.2.2 WSAHeader	456
6.280.3 Member Function Documentation	456
6.280.3.1 Action	456
6.280.3.2 Action	456
6.280.3.3 Check	456
6.280.3.4 FaultTo	456
6.280.3.5 From	456
6.280.3.6 MessageID	456
6.280.3.7 MessageID	456
6.280.3.8 NewReferenceParameter	456
6.280.3.9 operator XMLNode	456
6.280.3.10ReferenceParameter	456
6.280.3.11ReferenceParameter	457
6.280.3.12RelatesTo	457
6.280.3.13RelatesTo	457
6.280.3.14RelationshipType	457
6.280.3.15RelationshipType	457

6.280.3.16 ReplyTo	457
6.280.3.17 To	457
6.280.3.18 To	457
6.280.4 Field Documentation	457
6.280.4.1 header_allocated_	457
6.281 Arc::WSRF Class Reference	458
6.281.1 Detailed Description	458
6.281.2 Constructor & Destructor Documentation	459
6.281.2.1 WSRF	459
6.281.2.2 WSRF	459
6.281.3 Member Function Documentation	459
6.281.3.1 operator bool	459
6.281.3.2 set_namespaces	459
6.281.3.3 SOAP	459
6.281.4 Field Documentation	459
6.281.4.1 allocated_	459
6.281.4.2 valid_	459
6.282 Arc::WSRFBaseFault Class Reference	460
6.282.1 Detailed Description	460
6.282.2 Constructor & Destructor Documentation	460
6.282.2.1 WSRFBaseFault	460
6.282.2.2 WSRFBaseFault	460
6.282.3 Member Function Documentation	460
6.282.3.1 set_namespaces	460
6.283 Arc::WSRFResourceUnavailableFault Class Reference	461
6.284 Arc::WSRFResourceUnknownFault Class Reference	462
6.285 Arc::WSRP Class Reference	463
6.285.1 Detailed Description	463
6.285.2 Constructor & Destructor Documentation	464
6.285.2.1 WSRP	464
6.285.2.2 WSRP	464
6.285.3 Member Function Documentation	464
6.285.3.1 set_namespaces	464
6.286 Arc::WSRPDeleteResourceProperties Class Reference	465
6.287 Arc::WSRPDeleteResourcePropertiesRequest Class Reference	466
6.288 Arc::WSRPDeleteResourcePropertiesRequestFailedFault Class Reference	467

6.289Arc::WSRPDeleteResourcePropertiesResponse Class Reference	468
6.290Arc::WSRPFault Class Reference	469
6.290.1 Detailed Description	469
6.290.2 Constructor & Destructor Documentation	469
6.290.2.1 WSRPFault	469
6.290.2.2 WSRPFault	469
6.291Arc::WSRPGetMultipleResourcePropertiesRequest Class Reference	470
6.292Arc::WSRPGetMultipleResourcePropertiesResponse Class Reference	471
6.293Arc::WSRPGetResourcePropertyDocumentRequest Class Reference	472
6.294Arc::WSRPGetResourcePropertyDocumentResponse Class Reference	473
6.295Arc::WSRPGetResourcePropertyRequest Class Reference	474
6.296Arc::WSRPGetResourcePropertyResponse Class Reference	475
6.297Arc::WSRPInsertResourceProperties Class Reference	476
6.298Arc::WSRPInsertResourcePropertiesRequest Class Reference	477
6.299Arc::WSRPInsertResourcePropertiesRequestFailedFault Class Reference	478
6.300Arc::WSRPInsertResourcePropertiesResponse Class Reference	479
6.301Arc::WSRPInvalidModificationFault Class Reference	480
6.302Arc::WSRPInvalidResourcePropertyQNameFault Class Reference	481
6.303Arc::WSRPModifyResourceProperties Class Reference	482
6.304Arc::WSRPPutResourcePropertyDocumentRequest Class Reference	483
6.305Arc::WSRPPutResourcePropertyDocumentResponse Class Reference	484
6.306Arc::WSRPQueryResourcePropertiesRequest Class Reference	485
6.307Arc::WSRPQueryResourcePropertiesResponse Class Reference	486
6.308Arc::WSRPResourcePropertyChangeFailure Class Reference	487
6.308.1 Detailed Description	487
6.308.2 Constructor & Destructor Documentation	487
6.308.2.1 WSRPResourcePropertyChangeFailure	487
6.308.2.2 WSRPResourcePropertyChangeFailure	487
6.309Arc::WSRPSetResourcePropertiesRequest Class Reference	488
6.310Arc::WSRPSetResourcePropertiesResponse Class Reference	489
6.311Arc::WSRPSetResourcePropertyRequestFailedFault Class Reference	490
6.312Arc::WSRPUnableToModifyResourcePropertyFault Class Reference	491
6.313Arc::WSRPUnableToPutResourcePropertyDocumentFault Class Reference	492
6.314Arc::WSRPUpdateResourceProperties Class Reference	493
6.315Arc::WSRPUpdateResourcePropertiesRequest Class Reference	494
6.316Arc::WSRPUpdateResourcePropertiesRequestFailedFault Class Reference	495

6.317Arc::WSRPUupdateResourcePropertiesResponse Class Reference	496
6.318ArcSec::X500NameAttribute Class Reference	497
6.318.1 Member Function Documentation	497
6.318.1.1 encode	497
6.318.1.2 getId	497
6.318.1.3 getType	497
6.319Arc::X509Token Class Reference	498
6.319.1 Detailed Description	498
6.319.2 Member Enumeration Documentation	498
6.319.2.1 X509TokenType	498
6.319.3 Constructor & Destructor Documentation	498
6.319.3.1 X509Token	498
6.319.3.2 X509Token	498
6.319.3.3 ~X509Token	499
6.319.4 Member Function Documentation	499
6.319.4.1 Authenticate	499
6.319.4.2 Authenticate	499
6.319.4.3 operator bool	499
6.320Arc::XmlContainer Class Reference	500
6.321Arc::XmlDatabase Class Reference	501
6.322Arc::XMLNode Class Reference	502
6.322.1 Detailed Description	503
6.322.2 Constructor & Destructor Documentation	504
6.322.2.1 XMLNode	504
6.322.2.2 XMLNode	504
6.322.2.3 XMLNode	504
6.322.2.4 XMLNode	504
6.322.2.5 XMLNode	504
6.322.2.6 XMLNode	504
6.322.2.7 XMLNode	504
6.322.2.8 ~XMLNode	504
6.322.3 Member Function Documentation	504
6.322.3.1 Attribute	504
6.322.3.2 Attribute	505
6.322.3.3 Attribute	505
6.322.3.4 AttributesSize	505

6.322.3.5 Child	505
6.322.3.6 Destroy	505
6.322.3.7 FullName	505
6.322.3.8 Get	505
6.322.3.9 GetDoc	505
6.322.3.10GetRoot	505
6.322.3.11GetXML	506
6.322.3.12GetXML	506
6.322.3.13Name	506
6.322.3.14Name	506
6.322.3.15Name	506
6.322.3.16Namespace	506
6.322.3.17NamespacePrefix	506
6.322.3.18Namespaces	506
6.322.3.19Namespaces	506
6.322.3.20New	507
6.322.3.21NewAttribute	507
6.322.3.22NewAttribute	507
6.322.3.23NewChild	507
6.322.3.24NewChild	507
6.322.3.25NewChild	507
6.322.3.26NewChild	507
6.322.3.27NewChild	507
6.322.3.28operator bool	508
6.322.3.29operator std::string	508
6.322.3.30operator!	508
6.322.3.31operator!=	508
6.322.3.32operator!=	508
6.322.3.33operator!=	508
6.322.3.34operator!=	508
6.322.3.35operator++	508
6.322.3.36operator--	508
6.322.3.37operator=	508
6.322.3.38operator=	509
6.322.3.39operator=	509
6.322.3.40operator==	509

6.322.3.41operator==	509
6.322.3.42operator==	509
6.322.3.43operator==	509
6.322.3.44operator[]	509
6.322.3.45operator[]	509
6.322.3.46operator[]	509
6.322.3.47Parent	510
6.322.3.48Path	510
6.322.3.49Prefix	510
6.322.3.50ReadFromFile	510
6.322.3.51ReadFromStream	510
6.322.3.52Replace	510
6.322.3.53Same	510
6.322.3.54SaveToFile	510
6.322.3.55SaveToStream	510
6.322.3.56Set	510
6.322.3.57Size	511
6.322.3.58XPathLookup	511
6.322.4 Field Documentation	511
6.322.4.1 is_owner_	511
6.322.4.2 is_temporary_	511
6.323 Arc::XMLNodeContainer Class Reference	512
6.323.1 Detailed Description	512
6.323.2 Constructor & Destructor Documentation	512
6.323.2.1 XMLNodeContainer	512
6.323.2.2 XMLNodeContainer	512
6.323.3 Member Function Documentation	512
6.323.3.1 Add	512
6.323.3.2 Add	512
6.323.3.3 AddNew	512
6.323.3.4 AddNew	513
6.323.3.5 Nodes	513
6.323.3.6 operator=	513
6.323.3.7 operator[]	513
6.323.3.8 Size	513
6.324 Arc::XMLSecNode Class Reference	514

6.324.1 Detailed Description	514
6.324.2 Constructor & Destructor Documentation	514
6.324.2.1 XMLSecNode	514
6.324.3 Member Function Documentation	514
6.324.3.1 AddSignatureTemplate	514
6.324.3.2 DecryptNode	515
6.324.3.3 EncryptNode	515
6.324.3.4 SignNode	515
6.324.3.5 VerifyNode	515
6.325Arc::XRSLParser Class Reference	516
7 File Documentation	517
7.1 URL.h File Reference	517
7.1.1 Detailed Description	518
7.1.2 Define Documentation	518
7.1.2.1 RC_DEFAULT_PORT	518

Chapter 1

Namespace Index

1.1 Namespace List

Here is a list of all documented namespaces with brief descriptions:

Arc (Some utility methods for using xml security library (http://www.aleksey.com/xmlsec/))	23
ArcCredential	42

Chapter 2

Data Structure Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

ArcCredential::ACACI	45
ArcCredential::ACATTHOLDER	46
ArcCredential::ACATTR	47
ArcCredential::ACATTRIBUTE	48
ArcCredential::ACC	49
ArcCredential::ACCERTS	50
ArcCredential::ACDIGEST	51
ArcCredential::ACFORM	52
ArcCredential::ACFULLATTRIBUTES	53
ArcCredential::ACHOLDER	54
ArcCredential::ACIETFATTR	55
ArcCredential::ACINFO	56
ArcCredential::ACIS	57
ArcCredential::ACSEQ	58
ArcCredential::ACTARGET	59
ArcCredential::ACTARGETS	60
ArcCredential::ACVAL	61
Arc::ApplicationType	66
Arc::ArcLocation	68
ArcSec::ArcPeriod	69
ArcSec::Attr	71
Arc::AttributeIterator	73
ArcSec::AttributeProxy	76
ArcSec::AttributeValue	77
ArcSec::AnyURIAttribute	64
ArcSec::BooleanAttribute	86
ArcSec::DateAttribute	175
ArcSec::DateTimeAttribute	176
ArcSec::DurationAttribute	197
ArcSec::GenericAttribute	224
ArcSec::PeriodAttribute	333
ArcSec::StringAttribute	418
ArcSec::TimeAttribute	434

ArcSec::X500NameAttribute	497
ArcSec::Attr	79
ArcSec::AuthzRequest	80
ArcSec::AuthzRequestSection	81
Arc::AutoPointer< T >	82
Arc::Base64	83
Arc::BaseConfig	84
Arc::DMCCConfig	193
Arc::MCCConfig	279
Arc::ByteArray	92
Arc::CacheParameters	93
ArcCredential::cert_verify_context	94
Arc::ChainContext	95
Arc::Checksum	96
Arc::Adler32Sum	62
Arc::ChecksumAny	97
Arc::CRC32Sum	128
Arc::MD5Sum	284
Arc::ClientHTTPwithSAML2SSO	103
Arc::ClientInterface	104
Arc::ClientTCP	108
Arc::ClientHTTP	102
Arc::ClientSOAP	105
Arc::ClientSOAPwithSAML2SSO	107
Arc::ClientX509Delegation	109
ArcSec::CombiningAlg	111
ArcSec::DenyOverridesCombiningAlg	187
ArcSec::OrderedCombiningAlg	309
ArcSec::PermitOverridesCombiningAlg	334
Arc::ConfusaCertHandler	115
Arc::ConfusaParserUtils	116
Arc::CountedPointer< T >	118
Arc::Counter	119
Arc::IntraProcessCounter	244
Arc::CounterTicket	126
Arc::Credential	129
Arc::CredentialError	137
Arc::Database	138
Arc::MySQLDatabase	300
Arc::DataBuffer	140
Arc::DataCallback	146
Arc::DataHandle	147
Arc::DataMover	148
Arc::DataPoint	151
Arc::DataPointDirect	158
Arc::DataPointIndex	162
Arc::DataSourceType	166
Arc::DataSpeed	167
Arc::DataStagingType	170
Arc::DataStatus	171
Arc::DataTargetType	173

Arc::DataType	174
Arc::DirectoryType	188
Arc::FileType	220
Arc::DBranch	177
Arc::DelegationConsumer	178
Arc::DelegationConsumerSOAP	180
Arc::DelegationContainerSOAP	182
Arc::DelegationProvider	184
Arc::DelegationProviderSOAP	185
Arc::DiskSpaceRequirementType	189
Arc::DItem	190
Arc::DItemString	191
ArcSec::EvalResult	200
ArcSec::EvaluationCtx	201
ArcSec::EvaluatorContext	205
ArcSec::EvaluatorLoader	206
Arc::ExecutableType	208
Arc::ExecutionTarget	209
Arc::ExpirationReminder	211
Arc::FileCache	212
FileCacheHash	217
Arc::FileInfo	218
Arc::FileLock	219
ArcSec::Function	223
ArcSec::EqualFunction	198
ArcSec::InRangeFunction	243
ArcSec::MatchFunction	272
Arc::GlobusResult	225
Arc::GSSCredential	226
Arc::HTTPClientInfo	228
Arc::InfoCache	229
Arc::InfoFilter	231
Arc::InfoRegister	232
Arc::InfoRegisterContainer	233
Arc::InfoRegisters	234
Arc::InfoRegistrar	235
Arc::InformationInterface	238
Arc::InfoCacheInterface	230
Arc::InformationContainer	236
Arc::InformationRequest	240
Arc::InformationResponse	241
Arc::ISIS_description	248
Arc::IString	249
Arc::Job	251
Arc::JobDescription	256
Arc::JobDescriptionParser	257
Arc::ARCJSDLParser	67
Arc::JDLParser	250
Arc::XRSLParser	516
Arc::JobIdentificationType	258
Arc::JobMetaType	259
Arc::JobState	260

Arc::JobSupervisor	261
Arc::LoadableModuleDescription	262
Arc::Loader	263
Arc::BrokerLoader	89
Arc::DMCLoader	194
Arc::FinderLoader	221
Arc::JobControllerLoader	253
Arc::MCCLoader	281
Arc::SubmitterLoader	420
Arc::TargetRetrieverLoader	425
Arc::LogDestination	264
Arc::LogStream	270
Arc::Logger	265
Arc::LogMessage	268
Arc::MCC_Status	277
Arc::MemoryAllocationException	285
Arc::Message	286
Arc::MessageAttributes	289
Arc::MessageAuth	292
Arc::MessageAuthContext	293
Arc::MessageContext	294
Arc::MessageContextElement	295
ArcSec::PDPCConfigContext	329
Arc::MessagePayload	296
Arc::PayloadRawInterface	317
Arc::PayloadRaw	313
Arc::PayloadSOAP	319
Arc::PayloadStreamInterface	324
Arc::PayloadStream	320
Arc::PayloadWSRF	327
Arc::ModuleManager	297
Arc::PluginsFactory	343
Arc::ClassLoader	100
Arc::NS	304
Arc::OptionParser	308
passwd	310
Arc::PathIterator	311
Arc::PayloadRawBuf	316
Arc::Period	331
Arc::PlexerEntry	338
Arc::Plugin	339
Arc::Broker	87
Arc::DMC	192
Arc::JobController	252
Arc::MCCInterface	280
Arc::MCC	274
Arc::Plexer	336
Test::TestMCC	428
Test::TestMCC	428
Arc::Service	404
Arc::RegisteredService	361

Test::TestService	429
Arc::Submitter	419
Arc::TargetRetriever	424
ArcSec::AlgFactory	63
ArcSec::AttributeFactory	72
ArcSec::Evaluator	202
ArcSec::FnFactory	222
ArcSec::PDP	328
ArcSec::Policy	345
ArcSec::Request	363
ArcSec::SecHandler	399
Arc::PluginArgument	340
Arc::BrokerPluginArgument	91
Arc::ClassLoaderPluginArgument	101
Arc::DMCPluginArgument	195
Arc::JobControllerPluginArgument	255
Arc::MCCPluginArgument	283
Arc::ServicePluginArgument	407
Arc::SubmitterPluginArgument	422
Arc::TargetRetrieverPluginArgument	427
ArcSec::PDPPluginArgument	330
ArcSec::SecHandlerPluginArgument	402
Arc::PluginDescriptor	342
ArcSec::PolicyStore::PolicyElement	348
ArcSec::PolicyParser	349
ArcSec::PolicyStore	350
Arc::PrintFBase	352
Arc::PrintF< T0, T1, T2, T3, T4, T5, T6, T7 >	351
ArcCredential::PROXYCERTINFO_st	354
ArcCredential::PROXYPOLICY_st	355
Arc::Query	356
Arc::MySQLQuery	302
Arc::Range< T >	359
Arc::Register_Info_Type	360
Arc::RegularExpression	362
ArcSec::RequestAttribute	365
ArcSec::RequestItem	366
ArcSec::RequestTuple	367
Arc::ResourceSlotType	368
Arc::ResourcesType	369
Arc::ResourceTargetType	370
ArcSec::Response	371
ArcSec::ResponseItem	372
ArcSec::ResponseList	373
Arc::RSL	374
Arc::RSLBoolean	375
Arc::RSLCondition	377
Arc::RSLParser	380
Arc::RSLValue	382
Arc::RSLConcat	376
Arc::RSLList	378
Arc::RSLLiteral	379

Arc::RSLSequence	381
Arc::RSLVariable	383
Arc::Run	384
Arc::SAML2LoginClient	388
Arc::OAuthConsumer	305
Arc::SAML2SSOHTTPClient	389
Arc::HakaClient	227
Arc::OpenIdpClient	307
Arc::SAMLToken	391
Arc::ScalableTime< T >	394
Arc::SecAttr	395
Arc::MultiSecAttr	299
Arc::SecAttrFormat	397
Arc::SecAttrValue	398
Arc::CIStrngValue	98
ArcSec::Security	403
Arc::SimpleCondition	408
Arc::SOAPMessage	410
Arc::Software	412
Arc::ApplicationEnvironment	65
Arc::SoftwareRequirement	414
ArcSec::Source	415
ArcSec::SourceFile	416
ArcSec::SourceURL	417
Arc::TargetGenerator	423
Arc::ThreadInitializer	430
Arc::Time	431
Arc::URL	435
Arc::URLLocation	443
Arc::URLMap	445
Arc::User	446
Arc::UserConfig	447
Arc::UsernameToken	448
Arc::UserSwitch	450
Arc::VOMSTrustList	451
Arc::WSAEndpointReference	453
Arc::WSAHeader	455
Arc::WSRF	458
Arc::WSRFBaseFault	460
Arc::WSRFResourceUnavailableFault	461
Arc::WSRFResourceUnknownFault	462
Arc::WSRPFault	469
Arc::WSRPInvalidResourcePropertyQNameFault	481
Arc::WSRPResourcePropertyChangeFailure	487
Arc::WSRPDeleteResourcePropertiesRequestFailedFault	467
Arc::WSRPInsertResourcePropertiesRequestFailedFault	478
Arc::WSRPInvalidModificationFault	480
Arc::WSRPSetResourcePropertyRequestFailedFault	490
Arc::WSRPUnableToModifyResourcePropertyFault	491
Arc::WSRPUnableToPutResourcePropertyDocumentFault	492
Arc::WSRPUpdateResourcePropertiesRequestFailedFault	495

Arc::WSRP	463
Arc::WSRPDeleteResourcePropertiesRequest	466
Arc::WSRPDeleteResourcePropertiesResponse	468
Arc::WSRPGetMultipleResourcePropertiesRequest	470
Arc::WSRPGetMultipleResourcePropertiesResponse	471
Arc::WSRPGetResourcePropertyDocumentRequest	472
Arc::WSRPGetResourcePropertyDocumentResponse	473
Arc::WSRPGetResourcePropertyRequest	474
Arc::WSRPGetResourcePropertyResponse	475
Arc::WSRPInsertResourcePropertiesRequest	477
Arc::WSRPInsertResourcePropertiesResponse	479
Arc::WSRPPutResourcePropertyDocumentRequest	483
Arc::WSRPPutResourcePropertyDocumentResponse	484
Arc::WSRPQueryResourcePropertiesRequest	485
Arc::WSRPQueryResourcePropertiesResponse	486
Arc::WSRPSetResourcePropertiesRequest	488
Arc::WSRPSetResourcePropertiesResponse	489
Arc::WSRPUpdateResourcePropertiesRequest	494
Arc::WSRPUpdateResourcePropertiesResponse	496
Arc::WSRPModifyResourceProperties	482
Arc::WSRPDeleteResourceProperties	465
Arc::WSRPInsertResourceProperties	476
Arc::WSRPUpdateResourceProperties	493
Arc::X509Token	498
Arc::XmlContainer	500
Arc::XmlDatabase	501
Arc::XMLNode	502
Arc::Config	113
Arc::IniConfig	242
Arc::Profile	353
Arc::SecHandlerConfig	401
Arc::ARCPolicyHandlerConfig	70
Arc::DNListHandlerConfig	196
Arc::XMLSecNode	514
ArcSec::SecHandlerConfig	400
Arc::XMLNodeContainer	512

Chapter 3

Data Structure Index

3.1 Data Structures

Here are the data structures with brief descriptions:

ArcCredential::ACACI	45
ArcCredential::ACATTHOLDER	46
ArcCredential::ACATTR	47
ArcCredential::ACATTRIBUTE	48
ArcCredential::ACC	49
ArcCredential::ACCERTS	50
ArcCredential::ACDIGEST	51
ArcCredential::ACFORM	52
ArcCredential::ACFULLATTRIBUTES	53
ArcCredential::ACHOLDER	54
ArcCredential::ACIETFATTR	55
ArcCredential::ACINFO	56
ArcCredential::ACIS	57
ArcCredential::ACSEQ	58
ArcCredential::ACTARGET	59
ArcCredential::ACTARGETS	60
ArcCredential::ACVAL	61
Arc::Adler32Sum (Implementation of Adler32 checksum)	62
ArcSec::AlgFactory (Interface for algorithm factory class)	63
ArcSec::AnyURIAttribute	64
Arc::ApplicationEnvironment (ApplicationEnvironment (p. 65))	65
Arc::ApplicationType	66
Arc::ARCJSDLParser	67
Arc::ArcLocation (Determines ARC installation location)	68
ArcSec::ArcPeriod	69
Arc::ARCPolicyHandlerConfig	70
ArcSec::Attr (Attr (p. 71) contains a tuple of attribute type and value)	71
ArcSec::AttributeFactory	72
Arc::AttributeIterator (An iterator class for accessing multiple values of an attribute)	73
ArcSec::AttributeProxy (Interface for creating the AttributeValue (p. 77) object, it will be used by AttributeFactory (p. 72))	76
ArcSec::AttributeValue (Interface for containing different type of <Attribute> node for both policy and request)	77

ArcSec::Attrs (Attrs (p. 79) is a container for one or more Attr (p. 71))	79
ArcSec::AuthzRequest	80
ArcSec::AuthzRequestSection	81
Arc::AutoPointer < T > (Wrapper for pointer with automatic destruction)	82
Arc::Base64	83
Arc::BaseConfig	84
ArcSec::BooleanAttribute	86
Arc::Broker	87
Arc::BrokerLoader	89
Arc::BrokerPluginArgument	91
Arc::ByteArray	92
Arc::CacheParameters	93
ArcCredential::cert_verify_context	94
Arc::ChainContext (Interface to chain specific functionality)	95
Arc::Checksum (Defines interface for variuos checksum manipulations)	96
Arc::ChecksumAny (Wraper for Checksum (p. 96) class)	97
Arc::CIStrngValue (This class implements case insensitive strings as security attributes)	98
Arc::ClassLoader	100
Arc::ClassLoaderPluginArgument	101
Arc::ClientHTTP	102
Arc::ClientHTTPwithSAML2SSO	103
Arc::ClientInterface	104
Arc::ClientSOAP	105
Arc::ClientSOAPwithSAML2SSO	107
Arc::ClientTCP	108
Arc::ClientX509Delegation	109
ArcSec::CombiningAlg (Interface for combining algorithm)	111
Arc::Config (Configuration element - represents (sub)tree of ARC configuration)	113
Arc::ConfusaCertHandler	115
Arc::ConfusaParserUtils	116
Arc::CountedPointer < T > (Wrapper for pointer with automatic destruction and mutiple references)	118
Arc::Counter (A class defining a common interface for counters)	119
Arc::CounterTicket (A class for "tickets" that correspond to counter reservations)	126
Arc::CRC32Sum (Implementation of CRC32 checksum)	128
Arc::Credential	129
Arc::CredentialError	137
Arc::Database (Interface for calling database client library)	138
Arc::DataBuffer (Represents set of buffers)	140
Arc::DataCallback	146
Arc::DataHandle (This class is a wrapper around the DataPoint (p. 151) class)	147
Arc::DataMover	148
Arc::DataPoint (This base class is an abstraction of URL (p. 435))	151
Arc::DataPointDirect (This is a kind of generalized file handle)	158
Arc::DataPointIndex (Complements DataPoint (p. 151) with attributes common for Indexing Service (p. 404) URLs)	162
Arc::DataSourceType	166
Arc::DataSpeed (Keeps track of average and instantaneous transfer speed)	167
Arc::DataStagingType	170
Arc::DataStatus	171
Arc::DataTargetType	173
Arc::DataType	174
ArcSec::DateAttribute	175
ArcSec::DateTimeAttribute	176

Arc::DBranch	177
Arc::DelegationConsumer	178
Arc::DelegationConsumerSOAP	180
Arc::DelegationContainerSOAP	182
Arc::DelegationProvider	184
Arc::DelegationProviderSOAP	185
ArcSec::DenyOverridesCombiningAlg (Implement the "Deny-Overrides" algorithm)	187
Arc::DirectoryType	188
Arc::DiskSpaceRequirementType	189
Arc::DItem	190
Arc::DItemString	191
Arc::DMC	192
Arc::DMCConfig	193
Arc::DMCLoader	194
Arc::DMCPluginArgument	195
Arc::DNListHandlerConfig	196
ArcSec::DurationAttribute	197
ArcSec::EqualFunction (Evaluate whether the two values are equal)	198
ArcSec::EvalResult (Struct to record the xml node and effect, which will be used by Evaluator (p. 202) to get the information about which rule/policy(in xmlnode) is satisfied)	200
ArcSec::EvaluationCtx (EvaluationCtx (p. 201), in charge of storing some context information for)	201
ArcSec::Evaluator (Interface for policy evaluation. Execute the policy evaluation, based on the request and policy)	202
ArcSec::EvaluatorContext (Context for evaluator. It includes the factories which will be used to create related objects)	205
ArcSec::EvaluatorLoader (EvaluatorLoader (p. 206) is implemented as a helper class for loading different Evaluator (p. 202) objects, like ArcEvaluator)	206
Arc::ExecutableType	208
Arc::ExecutionTarget (ExecutionTarget (p. 209))	209
Arc::ExpirationReminder (A class intended for internal use within counters)	211
Arc::FileCache	212
FileCacheHash	217
Arc::FileInfo (FileInfo (p. 218) stores information about files (metadata))	218
Arc::FileLock	219
Arc::FileType	220
Arc::FinderLoader	221
ArcSec::FnFactory (Interface for function factory class)	222
ArcSec::Function (Interface for function, which is in charge of evaluating two AttributeValue (p. 77))	223
ArcSec::GenericAttribute	224
Arc::GlobusResult	225
Arc::GSSCredential	226
Arc::HakaClient	227
Arc::HTTPClientInfo	228
Arc::InfoCache (Stores XML document in filesystem split into parts)	229
Arc::InfoCacheInterface	230
Arc::InfoFilter (Filters information document according to identity of requestor)	231
Arc::InfoRegister (Registration to ISIS interface)	232
Arc::InfoRegisterContainer	233
Arc::InfoRegisters (Handling multiple registrations to ISISes)	234
Arc::InfoRegistrar (Registration process associated with particular ISIS)	235
Arc::InformationContainer (Information System document container and processor)	236
Arc::InformationInterface (Information System message processor)	238

Arc::InformationRequest (Request for information in InfoSystem)	240
Arc::InformationResponse (Informational response from InfoSystem)	241
Arc::IniConfig	242
ArcSec::InRangeFunction	243
Arc::IntraProcessCounter (A class for counters used by threads within a single process)	244
Arc::ISIS_description	248
Arc::IString	249
Arc::JDLParser	250
Arc::Job	251
Arc::JobController	252
Arc::JobControllerLoader	253
Arc::JobControllerPluginArgument	255
Arc::JobDescription	256
Arc::JobDescriptionParser	257
Arc::JobIdentificationType	258
Arc::JobMetaType	259
Arc::JobState	260
Arc::JobSupervisor	261
Arc::LoadableModuleDescription	262
Arc::Loader (Plugins loader)	263
Arc::LogDestination (A base class for log destinations)	264
Arc::Logger (A logger class)	265
Arc::LogMessage (A class for log messages)	268
Arc::LogStream (A class for logging to ostreams)	270
ArcSec::MatchFunction (Evaluate whether arg1 (value in regular expression) matched arg0 (table in regular expression))	272
Arc::MCC (Message (p. 286) Chain Component - base class for every MCC (p. 274) plugin)	274
Arc::MCC_Status (A class for communication of MCC (p. 274) processing results)	277
Arc::MCCConfig	279
Arc::MCCInterface (Interface for communication between MCC (p. 274), Service (p. 404) and Plexer (p. 336) objects)	280
Arc::MCCLoader (Creator of Message (p. 286) Component Chains (MCC (p. 274)))	281
Arc::MCCPluginArgument	283
Arc::MD5Sum (Implementation of MD5 checksum)	284
Arc::MemoryAllocationException	285
Arc::Message (Object being passed through chain of MCCs)	286
Arc::MessageAttributes (A class for storage of attribute values)	289
Arc::MessageAuth (Contains authenticity information, authorization tokens and decisions)	292
Arc::MessageAuthContext (Handler for content of message auth* context)	293
Arc::MessageContext (Handler for content of message context)	294
Arc::MessageContextElement (Top class for elements contained in message context)	295
Arc::MessagePayload (Base class for content of message passed through chain)	296
Arc::ModuleManager (Manager of shared libraries)	297
Arc::MultiSecAttr (Container of multiple SecAttr (p. 395) attributes)	299
Arc::MySQLDatabase	300
Arc::MySQLQuery	302
Arc::NS	304
Arc::OAuthConsumer	305
Arc::OpenIdpClient	307
Arc::OptionParser	308
ArcSec::OrderedCombiningAlg	309
passwd	310
Arc::PathIterator (Class to iterate through elements of path)	311
Arc::PayloadRaw (Raw byte multi-buffer)	313

Arc::PayloadRawBuf	316
Arc::PayloadRawInterface (Random Access Payload for Message (p. 286) objects)	317
Arc::PayloadSOAP (Payload of Message (p. 286) with SOAP content)	319
Arc::PayloadStream (POSIX handle as Payload)	320
Arc::PayloadStreamInterface (Stream-like Payload for Message (p. 286) object)	324
Arc::PayloadWSRF (This class combines MessagePayload (p. 296) with WSRF (p. 458))	327
ArcSec::PDP (Base class for Policy (p. 345) Decision Point plugins)	328
ArcSec::PDPConfigContext	329
ArcSec::PDPPluginArgument	330
Arc::Period	331
ArcSec::PeriodAttribute	333
ArcSec::PermitOverridesCombiningAlg (Implement the "Permit-Overrides" algorithm)	334
Arc::Plexer (The Plexer (p. 336) class, used for routing messages to services)	336
Arc::PlexerEntry (A pair of label (regex) and pointer to service)	338
Arc::Plugin (Base class for loadable ARC components)	339
Arc::PluginArgument (Base class for passing arguments to loadable ARC components)	340
Arc::PluginDescriptor (Description of ARC loadable component)	342
Arc::PluginsFactory (Generic ARC plugins loader)	343
ArcSec::Policy (Interface for containing and processing different types of policy)	345
ArcSec::PolicyStore::PolicyElement	348
ArcSec::PolicyParser (A interface which will isolate the policy object from actual policy storage (files, urls, database))	349
ArcSec::PolicyStore (Storage place for policy objects)	350
Arc::Printf< T0, T1, T2, T3, T4, T5, T6, T7 >	351
Arc::PrintfBase	352
Arc::Profile	353
ArcCredential::PROXYCERTINFO_st	354
ArcCredential::PROXYPOLICY_st	355
Arc::Query	356
Arc::Range< T >	359
Arc::Register_Info_Type	360
Arc::RegisteredService (Service (p. 404) - last component in a Message (p. 286) Chain)	361
Arc::RegularExpression (A regular expression class)	362
ArcSec::Request (Base class/Interface for request, includes a container for RequestItems and some operations)	363
ArcSec::RequestAttribute (Wrapper which includes AttributeValue (p. 77) object which is generated according to date type of one specific node in Request.xml)	365
ArcSec::RequestItem (Interface for request item container, <subjects, actions, objects, ctxs> tuple)	366
ArcSec::RequestTuple	367
Arc::ResourceSlotType	368
Arc::ResourcesType	369
Arc::ResourceTargetType	370
ArcSec::Response (Container for the evaluation results)	371
ArcSec::ResponseItem (Evaluation result concerning one RequestTuple (p. 367))	372
ArcSec::ResponseList	373
Arc::RSL	374
Arc::RSLBoolean	375
Arc::RSLConcat	376
Arc::RSLCondition	377
Arc::RSLList	378
Arc::RSLLiteral	379
Arc::RSLParser	380
Arc::RSLSequence	381

Arc::RSLValue	382
Arc::RSLVariable	383
Arc::Run	384
Arc::SAML2LoginClient	388
Arc::SAML2SSOHTTPClient	389
Arc::SAMLToken (Class for manipulating SAML Token Profile (p. 353))	391
Arc::ScalableTime < T >	394
Arc::SecAttr (This is an abstract interface to a security attribute)	395
Arc::SecAttrFormat (Export/import format)	397
Arc::SecAttrValue (This is an abstract interface to a security attribute)	398
ArcSec::SecHandler (Base class for simple security handling plugins)	399
ArcSec::SecHandlerConfig	400
ArcSec::SecHandlerConfig	401
ArcSec::SecHandlerPluginArgument	402
ArcSec::Security (Common stuff used by security related classes)	403
Arc::Service (Service (p. 404) - last component in a Message (p. 286) Chain)	404
Arc::ServicePluginArgument	407
Arc::SimpleCondition (Helper function to create simple thread)	408
Arc::SOAPMessage (Message (p. 286) restricted to SOAP payload)	410
Arc::Software	412
Arc::SoftwareRequirement	414
ArcSec::Source (Acquires and parses XML document from specified source)	415
ArcSec::SourceFile (Convenience class for obtaining XML document from file)	416
ArcSec::SourceURL (Convenience class for obtaining XML document from remote URL)	417
ArcSec::StringAttribute	418
Arc::Submitter	419
Arc::SubmitterLoader	420
Arc::SubmitterPluginArgument	422
Arc::TargetGenerator	423
Arc::TargetRetriever	424
Arc::TargetRetrieverLoader	425
Arc::TargetRetrieverPluginArgument	427
Test::TestMCC	428
Test::TestService	429
Arc::ThreadInitializer	430
Arc::Time (A class for storing and manipulating times)	431
ArcSec::TimeAttribute	434
Arc::URL	435
Arc::URLLocation (Class to hold a resolved URL (p. 435) location)	443
Arc::URLMap	445
Arc::User	446
Arc::UserConfig	447
Arc::UsernameToken (Interface for manipulation of WS-Security according to Username Token Profile (p. 353))	448
Arc::UserSwitch	450
Arc::VOMSTrustList	451
Arc::WSAEndpointReference (Interface for manipulation of WS-Addressing Endpoint Reference)	453
Arc::WSAHeader (Interface for manipulation WS-Addressing information in SOAP header)	455
Arc::WSRF (Base class for every WSRF (p. 458) message)	458
Arc::WSRFBaseFault (Base class for WSRF (p. 458) fault messages)	460
Arc::WSRFResourceUnavailableFault	461
Arc::WSRFResourceUnknownFault	462
Arc::WSRP (Base class for WS-ResourceProperties structures)	463

Arc::WSRPDeleteResourceProperties	465
Arc::WSRPDeleteResourcePropertiesRequest	466
Arc::WSRPDeleteResourcePropertiesRequestFailedFault	467
Arc::WSRPDeleteResourcePropertiesResponse	468
Arc::WSRPFault (Base class for WS-ResourceProperties faults)	469
Arc::WSRPGetMultipleResourcePropertiesRequest	470
Arc::WSRPGetMultipleResourcePropertiesResponse	471
Arc::WSRPGetResourcePropertyDocumentRequest	472
Arc::WSRPGetResourcePropertyDocumentResponse	473
Arc::WSRPGetResourcePropertyRequest	474
Arc::WSRPGetResourcePropertyResponse	475
Arc::WSRPInsertResourceProperties	476
Arc::WSRPInsertResourcePropertiesRequest	477
Arc::WSRPInsertResourcePropertiesRequestFailedFault	478
Arc::WSRPInsertResourcePropertiesResponse	479
Arc::WSRPInvalidModificationFault	480
Arc::WSRPInvalidResourcePropertyQNameFault	481
Arc::WSRPModifyResourceProperties	482
Arc::WSRPPutResourcePropertyDocumentRequest	483
Arc::WSRPPutResourcePropertyDocumentResponse	484
Arc::WSRPQueryResourcePropertiesRequest	485
Arc::WSRPQueryResourcePropertiesResponse	486
Arc::WSRPResourcePropertyChangeFailure	487
Arc::WSRPSetResourcePropertiesRequest	488
Arc::WSRPSetResourcePropertiesResponse	489
Arc::WSRPSetResourcePropertyRequestFailedFault	490
Arc::WSRPUnableToModifyResourcePropertyFault	491
Arc::WSRPUnableToPutResourcePropertyDocumentFault	492
Arc::WSRPUpdateResourceProperties	493
Arc::WSRPUpdateResourcePropertiesRequest	494
Arc::WSRPUpdateResourcePropertiesRequestFailedFault	495
Arc::WSRPUpdateResourcePropertiesResponse	496
ArcSec::X509NameAttribute	497
Arc::X509Token (Class for manipulating X.509 Token Profile (p. 353))	498
Arc::XmlContainer	500
Arc::XmlDatabase	501
Arc::XMLNode (Wrapper for LibXML library Tree interface)	502
Arc::XMLNodeContainer	512
Arc::XMLSecNode (Extends XMLNode (p. 502) class to support XML security operation)	514
Arc::XRSLParser	516

Chapter 4

File Index

4.1 File List

Here is a list of all documented files with brief descriptions:

AlgFactory.h	??
AnyURIAttribute.h	??
ArcConfig.h	??
ARCJSDLParser.h	??
ArcLocation.h	??
ArcRegex.h	??
AttributeFactory.h	??
AttributeProxy.h	??
AttributeValue.h	??
Base64.h	??
BooleanAttribute.h	??
Broker.h	??
ByteArray.h	??
CertUtil.h	??
Checksum.h	??
CISStringValue.h	??
ClassLoader.h	??
ClientInterface.h	??
ClientSAML2SSO.h	??
ClientX509Delegation.h	??
CombiningAlg.h	??
ConfusaCertHandler.h	??
ConfusaParserUtils.h	??
Counter.h	??
Credential.h	??
DataBuffer.h	??
DataCallback.h	??
DataHandle.h	??
DataMover.h	??
DataPoint.h	??
DataPointDirect.h	??
DataPointIndex.h	??
DataSpeed.h	??

DataStatus.h	??
DateTime.h	??
DateTimeAttribute.h	??
DBInterface.h	??
DBranch.h	??
DelegationInterface.h	??
DenyOverridesAlg.h	??
DMC.h	??
DMCLoader.h	??
EqualFunction.h	??
EvaluationCtx.h	??
Evaluator.h	??
EvaluatorLoader.h	??
ExecutionTarget.h	??
FileCache.h	??
FileCacheHash.h	??
FileInfo.h	??
FileLock.h	??
FileUtils.h	??
FinderLoader.h	??
FnFactory.h	??
Function.h	??
GenericAttribute.h	??
GlobusErrorUtils.h	??
GlobusWorkarounds.h	??
GSSCredential.h	??
GUID.h	??
HakaClient.h	??
InfoCache.h	??
InfoFilter.h	??
InfoRegister.h	??
InformationInterface.h	??
IniConfig.h	??
InRangeFunction.h	??
IntraProcessCounter.h	??
IString.h	??
JDLParser.h	??
Job.h	??
JobController.h	??
JobDescription.h	??
JobDescriptionParser.h	??
JobState.h	??
JobSupervisor.h	??
listfunc.h	??
Loader.h	??
Logger.h	??
MatchFunction.h	??
MCC.h	??
MCC_Status.h	??
MCCLoader.h	??
Message.h	??
MessageAttributes.h	??
MessageAuth.h	??
MkDirRecursive.h	??

ModuleManager.h	??
MysqlWrapper.h	??
OAuthConsumer.h	??
OpenIdpClient.h	??
OpenSSL.h	??
OptionParser.h	??
OrderedAlg.h	??
PayloadRaw.h	??
PayloadSOAP.h	??
PayloadStream.h	??
PayloadWSRF.h	??
PDP.h	??
PermitOverridesAlg.h	??
Plexer.h	??
Plugin.h	??
Policy.h	??
PolicyParser.h	??
PolicyStore.h	??
Profile.h	??
Proxycertinfo.h	??
RegisteredService.h	??
Request.h	??
RequestAttribute.h	??
RequestItem.h	??
Response.h	??
Result.h	??
RSLParser.h	??
Run.h	??
SAML2LoginClient.h	??
saml_util.h	??
SAMLToken.h	??
SecAttr.h	??
SecAttrValue.h	??
SecHandler.h	??
Security.h	??
Service.h	??
SOAPEnvelope.h	??
SOAPMessage.h	??
Software.h	??
Source.h	??
StringAttribute.h	??
StringConv.h	??
Submitter.h	??
TargetGenerator.h	??
TargetRetriever.h	??
loader/TestMCC.h	??
message/TestMCC.h	??
TestService.h	??
Thread.h	??
URL.h (Class to hold general URL's)	517
URLMap.h	??
User.h	??
UserConfig.h	??
UsernameToken.h	??

Utils.h	??
VOMSAttribute.h	??
VOMSUtil.h	??
win32.h	??
WSA.h	??
WSResourceProperties.h	??
WSRF.h	??
WSRFBaseFault.h	??
X500NameAttribute.h	??
X509Token.h	??
XmlContainer.h	??
XmlDatabase.h	??
XMLNode.h	??
XMLSecNode.h	??
XmlSecUtils.h	??
XRSLParser.h	??

Chapter 5

Namespace Documentation

5.1 Arc Namespace Reference

Some utility methods for using xml security library (<http://www.aleksey.com/xmlsec/>).

Data Structures

- class **ARCJSDLParser**
- class **Broker**
- class **BrokerLoader**
- class **BrokerPluginArgument**
- class **ClientInterface**
- class **ClientTCP**
- struct **HTTPClientInfo**
- class **ClientHTTP**
- 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 **ApplicationEnvironment**
ApplicationEnvironment (p. 65).
- class **ExecutionTarget**
ExecutionTarget (p. 209).

- class **JDLParser**
- class **Job**
- class **JobController**
- class **JobControllerLoader**
- class **JobControllerPluginArgument**
- class **Range**
- class **ScalableTime**
- class **JobIdentificationType**
- class **ExecutableType**
- class **ApplicationType**
- class **ResourceSlotType**
- class **DiskSpaceRequirementType**
- class **ResourceTargetType**
- class **ResourcesType**
- class **DataSourceType**
- class **DataTargetType**
- class **DataType**
- class **FileType**
- class **DirectoryType**
- class **DataStagingType**
- class **JobMetaType**
- class **JobDescription**
- class **JobDescriptionParser**
- class **JobState**
- class **JobSupervisor**
- class **RSLValue**
- class **RSLLiteral**
- class **RSLVariable**
- class **RSLConcat**
- class **RSLList**
- class **RSLSequence**
- class **RSL**
- class **RSLBoolean**
- class **RSLCondition**
- class **RSLParser**
- class **Software**
- class **SoftwareRequirement**
- class **Submitter**
- class **SubmitterLoader**
- class **SubmitterPluginArgument**
- class **TargetGenerator**
- class **TargetRetriever**
- class **TargetRetrieverLoader**
- class **TargetRetrieverPluginArgument**
- class **UserConfig**
- class **XRSLParser**
- 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 **Base64**
- class **MemoryAllocationException**
- class **ByteArray**
- 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 **DItem**
- class **DBranch**
- class **DItemString**
- class **FileLock**
- class **IniConfig**
- class **IntraProcessCounter**
A class for counters used by threads within a single process.
- class **PrintfBase**
- class **Printf**
- class **IString**
- class **LogMessage**
A class for log messages.
- class **LogDestination**
A base class for log destinations.
- class **LogStream**
A class for logging to ostream.
- class **Logger**
A logger class.
- class **MySQLDatabase**

- class **MySQLQuery**
- class **OptionParser**
- class **Profile**
- class **Run**
- class **SimpleCondition**
 - *Helper function to create simple thread.*

- class **ThreadInitializer**
- class **URL**
- class **URLLocation**
 - *Class to hold a resolved **URL** (p. 435) location.*

- class **PathIterator**
 - *Class to iterate through elements of path.*

- class **User**
- class **UserSwitch**
- 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 **VOMSTrustList**
- class **Checksum**
 - *Defines interface for variuos checksum manipulations.*

- class **CRC32Sum**
 - *Implementation of CRC32 checksum.*

- class **MD5Sum**
 - *Implementation of MD5 checksum.*

- class **Adler32Sum**
 - *Implementation of Adler32 checksum.*

- class **ChecksumAny**
 - *Wraper for **Checksum** (p. 96) class.*

- class **DataBuffer**
 - *Represents set of buffers.*

- class **DataCallback**

- class **DataHandle**

*This class is a wrapper around the **DataPoint** (p. 151) class.*

- class **DataMover**

- class **DataPoint**

*This base class is an abstraction of **URL** (p. 435).*

- class **DataPointDirect**

This is a kind of generalized file handle.

- class **DataPointIndex**

*Complements **DataPoint** (p. 151) with attributes common for **Indexing Service** (p. 404) URLs.*

- class **DataSpeed**

Keeps track of average and instantaneous transfer speed.

- class **DataStatus**

- class **DMC**

- class **DMCConfig**

- class **DMCPluginArgument**

- class **DMCLoader**

- struct **CacheParameters**

- class **FileCache**

- class **FileInfo**

***FileInfo** (p. 218) stores information about files (metadata).*

- class **URLMap**

- 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**
 - Service (p. 404) - last component in a Message (p. 286) Chain.*
- class **FinderLoader**
- class **Loader**
 - Plugins loader.*
- class **LoadableModuleDescription**
- 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 loadable component.*
- class **PluginsFactory**
 - Generic ARC plugins loader.*
- class **MCCInterface**
 - Interface for communication between MCC (p. 274), Service (p. 404) and Plexer (p. 336) objects.*
- class **MCC**
 - Message (p. 286) Chain Component - base class for every MCC (p. 274) plugin.*
- class **MCCConfig**
- class **MCCPluginArgument**
- class **MCC_Status**
 - A class for communication of MCC (p. 274) processing results.*

- class **MCCLoader**
*Creator of **Message** (p. 286) Component Chains (**MCC** (p. 274)).*
- 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**
An iterator class for accessing multiple values of an attribute.
- class **MessageAttributes**
A class for storage of attribute values.
- class **MessageAuth**
Contains authenticity information, authorization tokens and decisions.
- class **PayloadRawInterface**
*Random Access Payload for **Message** (p. 286) objects.*
- struct **PayloadRawBuf**
- class **PayloadRaw**
Raw byte multi-buffer.
- class **PayloadSOAP**
*Payload of **Message** (p. 286) with SOAP content.*
- class **PayloadStreamInterface**
*Stream-like Payload for **Message** (p. 286) object.*
- class **PayloadStream**
POSIX handle as Payload.
- class **PlexerEntry**
A pair of label (regex) and pointer to service.

- class **Plexer**
*The **Plexer** (p. 336) class, used for routing messages to services.*
- class **CIStrngValue**
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** (p. 395) attributes.*
- class **Service**
***Service** (p. 404) - last component in a **Message** (p. 286) Chain.*
- class **ServicePluginArgument**
- class **SOAPMessage**
***Message** (p. 286) restricted to SOAP payload.*
- class **ClassLoader**
- class **ClassLoaderPluginArgument**
- class **WSAEndpointReference**
Interface for manipulation of WS-Addressing Endpoint Reference.
- class **WSAHeader**
Interface for manipulation WS-Addressing information in SOAP header.
- class **SAMLToken**
*Class for manipulating SAML Token **Profile** (p. 353).*
- class **UsernameToken**
*Interface for manipulation of WS-Security according to Username Token **Profile** (p. 353).*
- class **X509Token**
*Class for manipulating X.509 Token **Profile** (p. 353).*
- class **PayloadWSRF**
*This class combines **MessagePayload** (p. 296) with **WSRF** (p. 458).*
- 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 (p. 458) message.

- class **WSRFBaseFault**

Base class for WSRF (p. 458) fault messages.

- class **WSRFResourceUnknownFault**
- class **WSRFResourceUnavailableFault**
- class **XMLSecNode**

Extends XMLNode (p. 502) 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 **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()`)
- `void GUID` (`std::string &guid`)
- `std::string UUID` (`void`)
- `std::ostream & operator<<` (`std::ostream &os`, `LogLevel level`)
- `template<typename T >`
T stringto (`const std::string &s`)
- `template<typename T >`
bool stringto (`const std::string &s`, `T &t`)
- `template<typename T >`
std::string toString (`T t`, `const int width=0`, `const int precision=0`)
- `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=" "`)
- `std::string trim` (`const std::string &str`, `const char *sep=NULL`)
- `std::string uri_unescape` (`const std::string &str`)
- `std::string convert_to_rdn` (`const std::string &dn`)
- `bool CreateThreadFunction` (`void(*func)(void *)`, `void *arg`)
- `std::list< URL > ReadURLList` (`const URL &urllist`)
- `std::string GetEnv` (`const std::string &var`)
- `bool SetEnv` (`const std::string &var`, `const std::string &value`)
- `void UnsetEnv` (`const std::string &var`)
- `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`, `const VOMSTrustList &vomscert_trust_dn`, `std::vector< std::string > &output`, `bool verify=true`)

- bool **parseVOMSAC** (**Credential** &holder_cred, const std::string &ca_cert_dir, const std::string &ca_cert_file, const **VOMSTrustList** &vomscert_trust_dn, std::vector< std::string > &output, bool verify=true)
- char * **VOMSDecode** (const char *data, int size, int *j)
- bool **OpenSSLInit** (void)
- void **HandleOpenSSLError** (void)
- void **HandleOpenSSLError** (int code)
- std::string **string** (**StatusKind** kind)
- const char * **ContentFromPayload** (const **MessagePayload** &payload)
- void **WSAFaultAssign** (SOAPEnvelope &message, **WSAFault** fid)
- **WSAFault** **WSAFaultExtract** (SOAPEnvelope &message)
- int **passphrase_callback** (char *buf, int size, int rflag, 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**

5.1.1 Detailed Description

Some utility methods for using xml security library (<http://www.aleksey.com/xmlsec/>). **ARCJSDLParser** (p.67) The **ARCJSDLParser** (p.67) class, derived from the **JobDescriptionParser** (p.257) class, is primarily a job description parser for the consolidated job description language (ARCJSDL), derived from JSDL, described in the following document http://svn.nordugrid.org/trac/nordugrid/browser/arcl/trunk/doc/tech_doc/client/job_description.odt. However it is also capable of parsing regular JSDL (GFD 136), the POSIX-JSDL extension (GFD 136) and the JSDL HPC **Profile** (p.353) Application Extension

(GFD 111 and GFD 114). When parsing ARCJSDL takes precedence over other non-ARCJSDL, so if a non-ARCJSDL element specifies the same attribute as ARCJSDL, the ARCJSDL element will be saved. The output generated by the `ARCJSDLParser::UnParse` method will follow that of the ARCJSDL document, see reference above.

JDLParser (p. 250) The **JDLParser** (p. 250) class, derived from the **JobDescriptionParser** (p. 257) class, is a job description parser for the **Job** (p. 251) Description Language (JDL) specified in CREAM **Job** (p. 251) Description Language Attributes Specification for the EGEE middleware (EGEE-JRA1-TEC-592336) and **Job** (p. 251) Description Language Attributes Specification for the gLite middleware (EGEE-JRA1-TEC-590869-JDL-Attributes-v0-8).

JobDescription (p. 256) The **JobDescription** (p. 256) 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.

JobDescriptionParser (p. 257) The **JobDescriptionParser** (p. 257) 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.

XRSLParser (p. 516) The **XRSLParser** (p. 516) class, derived from the **JobDescriptionParser** (p. 257) class, is a job description parser for the Extended Resource Specification Language (XRSL) specified in the NORDUGRID-MANUAL-4 document.

Credential (p. 129) class covers the functionality about general processing about certificate/key files, including: 1. certificate/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** (p. 129) class. For voms, it is some code about writing and parsing voms-implementing Attribute Certificate/ RFC3281, the voms-attribute 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.

Some implicit idea in the `ClassLoader/ModuleManager` stuff: `share_lib_name` (e.g. `mccsoap`) should be global identical `plugin_name` (e.g. `__arc_attrfactory_modules__`) should be global identical `desc->name` (e.g. `attr.factory`) should also be global identical

5.1.2 Typedef Documentation

5.1.2.1 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** (p. 289) class as well as the `AttributesIterator` class, but is not visible externally.

5.1.2.2 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** (p. 289) class, but is not visible externally.

5.1.2.3 typedef std::multimap<std::string, std::string> Arc::AttrMap

A typedef 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 MessageAttributes class for internal storage of message attributes, but is not visible externally.

5.1.2.4 typedef Plugin>(* Arc::get_plugin_instance)(PluginArgument *arg)

Constructor function of ARC loadable 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.

5.1.3 Enumeration Type Documentation

5.1.3.1 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. DEBUG level designates fine-grained informational events that are most useful to debug an application. VERBOSE level designates finer-grained informational events than the DEBUG

5.1.3.2 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** (p. 286) does not fit into expected protocol.

BUSY_ERROR There is no destination configured for this message.

SESSION_CLOSE **Message** (p. 286) can't be processed now.

5.1.3.3 enum Arc::WSAFault

WS-Addressing possible faults.

Enumerator:

WSAFaultUnknown This is not a fault

WSAFaultInvalidAddressingHeader This is not a WS-Addressing fault

5.1.4 Function Documentation**5.1.4.1 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)

5.1.4.2 const char* Arc::ContentFromPayload (const MessagePayload & *payload*)

Returns pointer to main memory chunk of **Message** (p. 286) payload. If no buffer is present or if payload is not of **PayloadRawInterface** (p. 317) type NULL is returned.

5.1.4.3 bool Arc::CreateThreadFunction (void(*)(void *) *func*, void * *arg*)

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 peculiarities of Glib::Thread API. As result it runs function 'func' with argument 'arg' in a separate thread. Returns true on success.

5.1.4.4 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

5.1.4.5 bool Arc::final_xmlsec (void)

Finalize the xml security library

5.1.4.6 `std::string Arc::get_cert_str (const char * certfile)`

Get certificate in string format from certificate file

5.1.4.7 `std::string Arc::get_key_from_certfile (const char * certfile)`

Get public key in string format from certificate file

5.1.4.8 `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-----")

5.1.4.9 `xmlSecKey* Arc::get_key_from_keyfile (const char * keyfile)`

Get key in xmlSecKey structure from key file

5.1.4.10 `xmlSecKey* Arc::get_key_from_keystr (const std::string & value)`

Get key in xmlSecKey structure from key in string format

5.1.4.11 `XMLNode Arc::get_node (XMLNode & parent, const char * name)`

Generate a new child `XMLNode` (p. 502) with specified name

5.1.4.12 `bool Arc::init_xmlsec (void)`

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

5.1.4.13 `xmlSecKeysMngrPtr Arc::load_key_from_certfile (xmlSecKeysMngrPtr * keys_manager, const char * certfile)`

Load public key from a certificate file into key manager

5.1.4.14 `xmlSecKeysMngrPtr Arc::load_key_from_certstr (xmlSecKeysMngrPtr * keys_manager, const std::string & certstr)`

Load public key from a certificate string into key manager

5.1.4.15 `xmlSecKeysMngrPtr Arc::load_key_from_keyfile (xmlSecKeysMngrPtr * keys_manager, const char * keyfile)`

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

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

Load trusted certificate from certificate file into key manager

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

Load trusted certificate from certificate string into key manager

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

Load trusted certificates from a file or directory into key manager

5.1.4.19 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

5.1.4.20 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

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

Returns true if underlying XML elements have same names

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

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

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

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

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

Returns true if underlying XML elements belong to same namespaces

5.1.4.25 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` (p. 68) it is advisable to call it after `ArcLocation::Init()` (p. 68).

5.1.4.26 `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.

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

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

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

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

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

Parse the certificate. The same as the above one

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

Parse the certificate, and output the attributes.

Parameters:

holder The proxy certificate which includes the voms specific formatted 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=KnowARC/CN=voms.knowarc.eu /O=Grid/O=NorduGrid/CN=NorduGrid Certification Authority See more in : <https://twiki.cern.ch/twiki/bin/view/LCG/VomsFAQforServiceManagers>

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_ATTRIBUTES. 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 attribute values be identical, the voms server information is added as prefix of the original attributes in AC. for AC_FULL_ATTRIBUTES, the voname + 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 should be set as 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.

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

callback method for inputing passphrase of key file

5.1.4.32 std::string Arc::string (StatusKind kind)

Conversion to string. Conversion from StatusKind to string.

Parameters:

kind The StatusKind to convert.

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

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

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

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

5.1.4.35 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

5.1.4.36 void Arc::WSAFaultAssign (SOAPEnvelope & message, WSAFault fid)

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

5.1.4.37 WSAFault Arc::WSAFaultExtract (SOAPEnvelope & message)

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

5.1.5 Variable Documentation**5.1.5.1 Logger Arc::CredentialLogger**

Logger (p. 265) to be used by all modules of credentials library

5.1.5.2 `const char* Arc::plugins_table_name`

Name of symbol referring 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** (p. 342) elements. The array is terminated by element with all components set to NULL.

5.1.5.3 `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.

5.2 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_IMPERSONATION_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_PROXY,`
 - `CERT_TYPE_RFC_IMPERSONATION_PROXY, CERT_TYPE_RFC_INDEPENDENT_PROXY,`
 - `CERT_TYPE_RFC_LIMITED_PROXY, CERT_TYPE_RFC_RESTRICTED_PROXY,`
 - `CERT_TYPE_RFC_ANYLANGUAGE_PROXY }`

5.2.1 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` (p.??) and `VOMSAttribute.cpp` are integration about code written by VOMS project, so here the original license follows.

5.2.2 Enumeration Type Documentation

5.2.2.1 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 RFC compliant restricted proxy

CERT_TYPE_RFC_ANYLANGUAGE_PROXY RFC anyLanguage proxy

Chapter 6

Data Structure Documentation

6.1 ArcCredential::ACACI Struct Reference

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

- VOMSAttribute.h

6.2 ArcCredential::ACATTHOLDER Struct Reference

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

- VOMSAttribute.h

6.3 ArcCredential::ACATTR Struct Reference

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

- VOMSAttribute.h

6.4 ArcCredential::ACATTRIBUTE Struct Reference

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

- VOMSAttribute.h

6.5 ArcCredential::ACC Struct Reference

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

- VOMSAttribute.h

6.6 ArcCredential::ACCERTS Struct Reference

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

- VOMSAttribute.h

6.7 ArcCredential::ACDIGEST Struct Reference

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

- VOMSAttribute.h

6.8 ArcCredential::ACFORM Struct Reference

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

- VOMSAttribute.h

6.9 ArcCredential::ACFULLATTRIBUTES Struct Reference

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

- VOMSAttribute.h

6.10 ArcCredential::ACHOLDER Struct Reference

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

- VOMSAttribute.h

6.11 ArcCredential::ACIETFATTR Struct Reference

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

- VOMSAttribute.h

6.12 ArcCredential::ACINFO Struct Reference

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

- VOMSAttribute.h

6.13 ArcCredential::ACIS Struct Reference

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

- VOMSAttribute.h

6.14 ArcCredential::ACSEQ Struct Reference

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

- VOMSAttribute.h

6.15 ArcCredential::ACTARGET Struct Reference

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

- VOMSAttribute.h

6.16 ArcCredential::ACTARGETS Struct Reference

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

- VOMSAttribute.h

6.17 ArcCredential::ACVAL Struct Reference

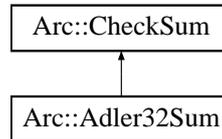
The documentation for this struct was generated from the following file:

- VOMSAttribute.h

6.18 Arc::Adler32Sum Class Reference

Implementation of Adler32 checksum.

#include <Checksum.h> Inheritance diagram for Arc::Adler32Sum::



6.18.1 Detailed Description

Implementation of Adler32 checksum.

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

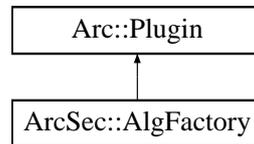
- CheckSum.h

6.19 ArcSec::AlgFactory Class Reference

Interface for algorithm factory class.

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

Inheritance diagram for ArcSec::AlgFactory::



Public Member Functions

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

6.19.1 Detailed Description

Interface for algorithm factory class. **AlgFactory** (p. 63) is in charge of creating **CombiningAlg** (p. 111) 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.

6.19.2 Member Function Documentation

6.19.2.1 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:

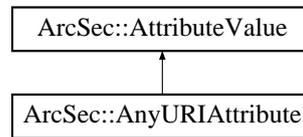
The object of **CombiningAlg** (p. 111)

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

- AlgFactory.h

6.20 ArcSec::AnyURIAttribute Class Reference

Inheritance diagram for ArcSec::AnyURIAttribute::



Public Member Functions

- virtual std::string **encode** ()
- std::string **getId** ()
- virtual std::string **getType** ()

6.20.1 Member Function Documentation

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

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 78).

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

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

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

Get the DataType of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

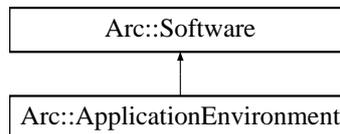
The documentation for this class was generated from the following file:

- AnyURIAttribute.h

6.21 Arc::ApplicationEnvironment Class Reference

ApplicationEnvironment (p. 65).

#include <ExecutionTarget.h> Inheritance diagram for Arc::ApplicationEnvironment::



6.21.1 Detailed Description

ApplicationEnvironment (p. 65). The ApplicationEnvironment is closely related to the definition given in GLUE2. By extending the **Software** (p. 412) class the two GLUE2 attributes AppName and AppVersion are mapped to two private members. However these can be obtained through the inherited 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

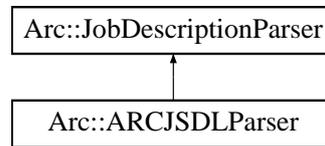
6.22 Arc::ApplicationType Class Reference

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

- JobDescription.h

6.23 Arc::ARCJSDLParser Class Reference

Inheritance diagram for Arc::ARCJSDLParser::



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

- ARCJSDLParser.h

6.24 Arc::ArcLocation Class Reference

Determines ARC installation location.

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

Static Public Member Functions

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

6.24.1 Detailed Description

Determines ARC installation location.

6.24.2 Member Function Documentation

6.24.2.1 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.

6.24.2.2 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

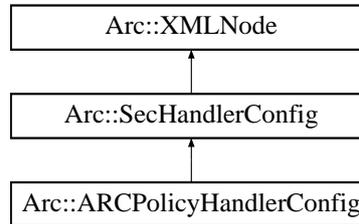
6.25 ArcSec::ArcPeriod Struct Reference

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

- DateTimeAttribute.h

6.26 Arc::ARCPolicyHandlerConfig Class Reference

Inheritance diagram for Arc::ARCPolicyHandlerConfig::



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

- ClientInterface.h

6.27 ArcSec::Attr Struct Reference

Attr (p. 71) contains a tuple of attribute type and value.

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

6.27.1 Detailed Description

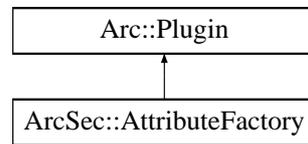
Attr (p. 71) contains a tuple of attribute type and value.

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

- Request.h

6.28 ArcSec::AttributeFactory Class Reference

`#include <AttributeFactory.h>`Inheritance diagram for ArcSec::AttributeFactory::



6.28.1 Detailed Description

Base attribute factory class

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

- AttributeFactory.h

6.29 Arc::AttributeIterator Class Reference

An iterator class for accessing multiple values of an attribute.

```
#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**

6.29.1 Detailed Description

An 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** (p. 289) class returns an **AttributeIterator** (p. 73) 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;
```

6.29.2 Constructor & Destructor Documentation

6.29.2.1 Arc::AttributeIterator::AttributeIterator ()

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

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

Protected constructor used by the `MessageAttributes` (p. 289) 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` (p. 289) class.

Parameters:

begin A `const_iterator` pointing to the first matching key-value pair in the internal multimap of the `MessageAttributes` (p. 289) class.

end A `const_iterator` pointing to the first key-value pair in the internal multimap of the `MessageAttributes` (p. 289) class where the key is larger than the key searched for.

6.29.3 Member Function Documentation

6.29.3.1 `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.

6.29.3.2 `const std::string& Arc::AttributeIterator::key (void) const`

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

6.29.3.3 `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.

6.29.3.4 `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.

6.29.3.5 `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.

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

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

6.29.4 Friends And Related Function Documentation

6.29.4.1 `friend class MessageAttributes [friend]`

The `MessageAttributes` (p. 289) class is a friend. The constructor that creates an `AttributeIterator` (p. 73) that is connected to the internal multimap of the `MessageAttributes` (p. 289) class should not be exposed to the outside, but it still needs to be accessible from the `getAll()` method of the `MessageAttributes` (p. 289) class. Therefore, that class is a friend.

6.29.5 Field Documentation

6.29.5.1 `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` (p. 289) class.

6.29.5.2 `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` (p. 289) class where the key is larger than the key searched for.

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

- `MessageAttributes.h`

6.30 ArcSec::AttributeProxy Class Reference

Interface for creating the **AttributeValue** (p. 77) object, it will be used by **AttributeFactory** (p. 72).

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

Public Member Functions

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

6.30.1 Detailed Description

Interface for creating the **AttributeValue** (p. 77) object, it will be used by **AttributeFactory** (p. 72). The **AttributeProxy** (p. 76) 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** (p. 77)

6.30.2 Member Function Documentation

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

Create a **AttributeValue** (p. 77) object according to the information inside the **XMLNode** as parameter.

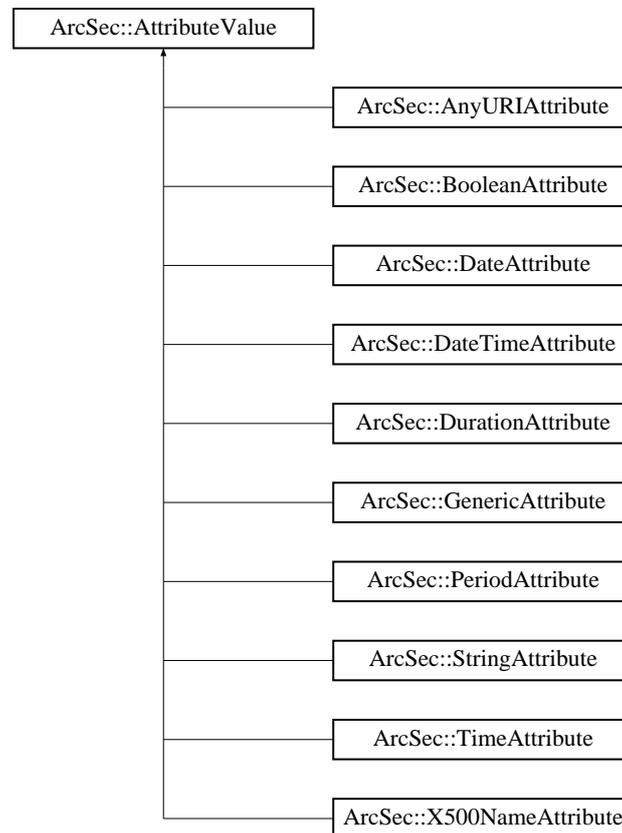
The documentation for this class was generated from the following file:

- **AttributeProxy.h**

6.31 ArcSec::AttributeValue Class Reference

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

#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

6.31.1 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" should inherit this class. The "Type" supported so far is: **StringAttribute** (p. 418), **DateAttribute** (p. 175), **TimeAttribute** (p. 434), **DurationAttribute** (p. 197), **PeriodAttribute** (p. 333), **AnyURIAttribute** (p. 64), **X500NameAttribute** (p. 497)

6.31.2 Member Function Documentation

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

encode the value in a string format

Implemented in [ArcSec::AnyURIAttribute](#) (p. 64), [ArcSec::BooleanAttribute](#) (p. 86), [ArcSec::DateTimeAttribute](#) (p. 176), [ArcSec::TimeAttribute](#) (p. 434), [ArcSec::DateAttribute](#) (p. 175), [ArcSec::DurationAttribute](#) (p. 197), [ArcSec::PeriodAttribute](#) (p. 333), [ArcSec::GenericAttribute](#) (p. 224), [ArcSec::StringAttribute](#) (p. 418), and [ArcSec::X500NameAttribute](#) (p. 497).

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

Evaluate whether "this" equals to the parameter value

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

Get the AttributeId of the <Attribute>

Implemented in [ArcSec::AnyURIAttribute](#) (p. 64), [ArcSec::BooleanAttribute](#) (p. 86), [ArcSec::DateTimeAttribute](#) (p. 176), [ArcSec::TimeAttribute](#) (p. 434), [ArcSec::DateAttribute](#) (p. 175), [ArcSec::DurationAttribute](#) (p. 197), [ArcSec::PeriodAttribute](#) (p. 333), [ArcSec::GenericAttribute](#) (p. 224), [ArcSec::StringAttribute](#) (p. 418), and [ArcSec::X500NameAttribute](#) (p. 497).

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

Get the DataType of the <Attribute>

Implemented in [ArcSec::AnyURIAttribute](#) (p. 64), [ArcSec::BooleanAttribute](#) (p. 86), [ArcSec::DateTimeAttribute](#) (p. 176), [ArcSec::TimeAttribute](#) (p. 434), [ArcSec::DateAttribute](#) (p. 175), [ArcSec::DurationAttribute](#) (p. 197), [ArcSec::PeriodAttribute](#) (p. 333), [ArcSec::GenericAttribute](#) (p. 224), [ArcSec::StringAttribute](#) (p. 418), and [ArcSec::X500NameAttribute](#) (p. 497).

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

- AttributeValue.h

6.32 ArcSec::Attrs Class Reference

Attrs (p. 79) is a container for one or more **Attr** (p. 71).

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

6.32.1 Detailed Description

Attrs (p. 79) is a container for one or more **Attr** (p. 71). **Attrs** (p. 79) includes includes methods for inserting, getting items, and counting size as well

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

- Request.h

6.33 ArcSec::AuthzRequest Struct Reference

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

- PDF.h

6.34 ArcSec::AuthzRequestSection Struct Reference

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

6.34.1 Detailed Description

These structure are based on the request schema for **PDP** (p. 328), 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

6.35 Arc::AutoPointer< T > Class Template Reference

Wrapper for pointer with automatic destruction.

```
#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
- **operator T *** (void) const

6.35.1 Detailed Description

```
template<typename T> class Arc::AutoPointer< T >
```

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

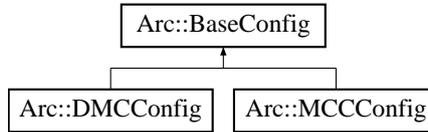
6.36 Arc::Base64 Class Reference

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

- Base64.h

6.37 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

6.37.1 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.

6.37.2 Member Function Documentation

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

Add CA directory

Referenced by Arc::DataPoint::ApplySecurity().

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

Add CA file

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

Add certificate

Referenced by Arc::DataPoint::ApplySecurity().

6.37.2.4 void Arc::BaseConfig::AddOverlay (XMLNode cfg)

Add configuration overlay

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

Adds non-standard location of plugins

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

Add private key

Referenced by Arc::DataPoint::ApplySecurity().

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

Add credentials proxy

Referenced by Arc::DataPoint::ApplySecurity().

6.37.2.8 void Arc::BaseConfig::GetOverlay (std::string fname)

Read overlay from file

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

Adds configuration part corresponding to stored information into common configuration tree supplied in 'cfg' argument.

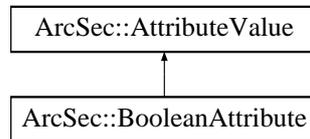
Reimplemented in Arc::DMCConfig (p. 193), and Arc::MCCConfig (p. 279).

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

- ArcConfig.h

6.38 ArcSec::BooleanAttribute Class Reference

Inheritance diagram for ArcSec::BooleanAttribute::



Public Member Functions

- virtual std::string **encode** ()
- std::string **getId** ()
- std::string **getType** ()

6.38.1 Member Function Documentation

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

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 78).

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

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

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

Get the DataType of the <Attribute>

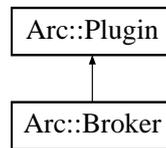
Implements **ArcSec::AttributeValue** (p. 78).

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

- BooleanAttribute.h

6.39 Arc::Broker Class Reference

Inheritance diagram for Arc::Broker::



Public Member Functions

- const **ExecutionTarget** * **GetBestTarget** ()
- void **PreFilterTargets** (std::list< **ExecutionTarget** > &targets, const **JobDescription** &job)
- void **RegisterJobsubmission** ()

Protected Member Functions

- virtual void **SortTargets** ()=0

Protected Attributes

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

6.39.1 Member Function Documentation

6.39.1.1 const **ExecutionTarget*** Arc::Broker::GetBestTarget ()

Returns next target from the list of **ExecutionTarget** (p. 209) objects. When first called this method will sort its list of **ExecutionTarget** (p. 209) 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** (p. 209) in the list is returned.

6.39.1.2 void Arc::Broker::PreFilterTargets (std::list< **ExecutionTarget** > & targets, const **JobDescription** & job)

ExecutionTarget (p. 209) filtering, view-point: enough memory, diskspace, CPUs, etc. The "bad" targets will be ignored and only the good targets will be added to to the list of **ExecutionTarget** (p. 209) objects which will be used for brokering.

Parameters:

targets A list of **ExecutionTarget** (p. 209) objects to be considered for addition to the **Broker** (p. 87).
jd **JobDescription** (p. 256) object of the actual job.

6.39.1.3 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: FastestQueueBroker, **ExecutionTarget** (p. 209) which has the shortest queue length will be at the beginning of the PossibleTargets list

6.39.2 Field Documentation**6.39.2.1 std::list<ExecutionTarget*> Arc::Broker::PossibleTargets [protected]**

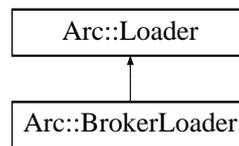
This content the Prefilteres ExecutionTargets. If an Execution Tartget has enough memory, CPU, diskspace, etc. for the actual job requirement than it will be added to the PossibleTargets list

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

- Broker.h

6.40 Arc::BrokerLoader Class Reference

#include <Broker.h>Inheritance diagram for Arc::BrokerLoader::



Public Member Functions

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

6.40.1 Detailed Description

Class responsible for loading **Broker** (p. 87) plugins The **Broker** (p. 87) objects returned by a **BrokerLoader** (p. 89) must not be used after the **BrokerLoader** (p. 89) goes out of scope.

6.40.2 Constructor & Destructor Documentation

6.40.2.1 Arc::BrokerLoader::BrokerLoader ()

Constructor Creates a new **BrokerLoader** (p. 89).

6.40.2.2 Arc::BrokerLoader::~~BrokerLoader ()

Destructor Calling the destructor destroys all Brokers loaded by the **BrokerLoader** (p. 89) instance.

6.40.3 Member Function Documentation

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

Retrieve the list of loaded Brokers.

Returns:

A reference to the list of Brokers.

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

Load a new **Broker** (p. 87)

Parameters:

- name* The name of the **Broker** (p. 87) to load.
- cfg* The **Config** (p. 113) object for the new **Broker** (p. 87).
- usercfg* The **UserConfig** (p. 447) object for the new **Broker** (p. 87).

Returns:

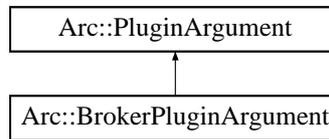
A pointer to the new **Broker** (p. 87) (NULL on error).

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

- Broker.h

6.41 Arc::BrokerPluginArgument Class Reference

Inheritance diagram for Arc::BrokerPluginArgument::



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

- Broker.h

6.42 Arc::ByteArray Class Reference

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

- ByteArray.h

6.43 Arc::CacheParameters Struct Reference

```
#include <FileCache.h>
```

6.43.1 Detailed Description

Contains data on the parameters of a cache.

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

- FileCache.h

6.44 ArcCredential::cert_verify_context Struct Reference

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

- CertUtil.h

6.45 Arc::ChainContext Class Reference

Interface to chain specific functionality.

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

Public Member Functions

- **operator PluginsFactory * ()**

6.45.1 Detailed Description

Interface to chain specific functionality. Object of this class is associated with every **MCCLoader** (p. 281) object. It is accessible for **MCC** (p. 274) and **Service** (p. 404) components and provides an interface to manipulate chains stored in **Loader** (p. 263). This makes it possible to modify chains dynamically - like deploying new services on demand.

6.45.2 Member Function Documentation

6.45.2.1 Arc::ChainContext::operator PluginsFactory * () [inline]

Returns associated **PluginsFactory** (p. 343) object

References Arc::Loader::factory_.

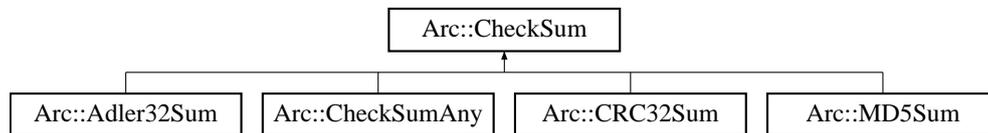
The documentation for this class was generated from the following file:

- MCCLoader.h

6.46 Arc::Checksum Class Reference

Defines interface for variuos checksum manipulations.

`#include <Checksum.h>`Inheritance diagram for Arc::Checksum::



6.46.1 Detailed Description

Defines interface for variuos checksum manipulations. This class is used during data transfers through **DataBuffer** (p. 140) class

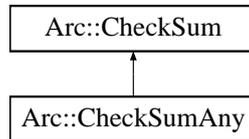
The documentation for this class was generated from the following file:

- CheckSum.h

6.47 Arc::ChecksumAny Class Reference

Wrapper for **Checksum** (p. 96) class.

#include <Checksum.h> Inheritance diagram for Arc::ChecksumAny::



6.47.1 Detailed Description

Wrapper for **Checksum** (p. 96) class. To be used for manipulation of any supported checksum type in a transparent way.

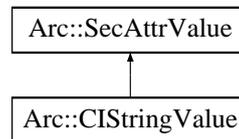
The documentation for this class was generated from the following file:

- CheckSum.h

6.48 Arc::CStringValue Class Reference

This class implements case insensitive strings as security attributes.

#include <CStringValue.h> Inheritance diagram for Arc::CStringValue::



Public Member Functions

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

Protected Member Functions

- virtual bool **equal** (SecAttrValue &b)

6.48.1 Detailed Description

This class implements case insensitive strings as security attributes. This is an example of how to inherit **SecAttrValue** (p. 398). The class is meant to implement security attributes that are case insensitive strings.

6.48.2 Constructor & Destructor Documentation

6.48.2.1 Arc::CStringValue::CStringValue ()

Default constructor

6.48.2.2 Arc::CStringValue::CStringValue (const char * ss)

This is a constructor that takes a string literal.

6.48.2.3 Arc::CStringValue::CStringValue (const std::string & ss)

This is a constructor that takes a string object.

6.48.3 Member Function Documentation

6.48.3.1 virtual bool Arc::CStringValue::equal (SecAttrValue & b) [protected, virtual]

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

6.48.3.2 virtual Arc::CIStrngValue::operator bool () [virtual]

This function returns false if the string is empty or uninitialized

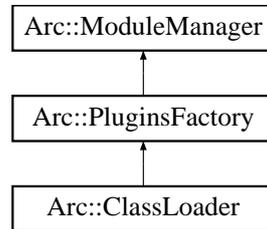
Reimplemented from **Arc::SecAttrValue** (p. 398).

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

- CIStrngValue.h

6.49 Arc::ClassLoader Class Reference

Inheritance diagram for Arc::ClassLoader::

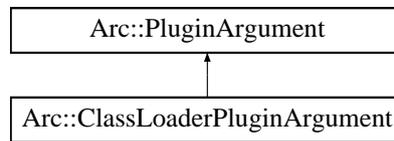


The documentation for this class was generated from the following file:

- ClassLoader.h

6.50 Arc::ClassLoaderPluginArgument Class Reference

Inheritance diagram for Arc::ClassLoaderPluginArgument::

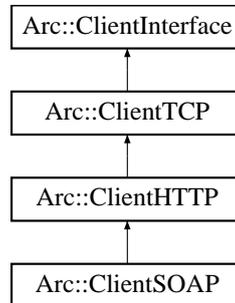


The documentation for this class was generated from the following file:

- ClassLoader.h

6.51 Arc::ClientHTTP Class Reference

Inheritance diagram for Arc::ClientHTTP::



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

- ClientInterface.h

6.52 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)

6.52.1 Constructor & Destructor Documentation

6.52.1.1 Arc::ClientHTTPwithSAML2SSO::ClientHTTPwithSAML2SSO () [inline]

Constructor creates MCC (p. 274) chain and connects to server.

6.52.2 Member Function Documentation

6.52.2.1 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)

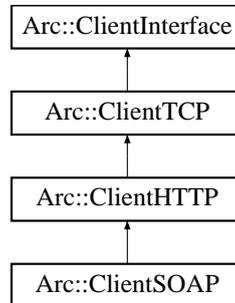
Send HTTP request and receive response.

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

- ClientSAML2SSO.h

6.53 Arc::ClientInterface Class Reference

Inheritance diagram for Arc::ClientInterface::

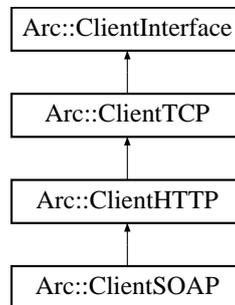


The documentation for this class was generated from the following file:

- ClientInterface.h

6.54 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 void **Load** ()

6.54.1 Detailed Description

Class with easy interface for sending/receiving SOAP messages over HTTP(S/G). It takes care of configuring **MCC** (p. 274) chain and making an entry point.

6.54.2 Constructor & Destructor Documentation

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

Constructor creates **MCC** (p. 274) chain and connects to server.

6.54.3 Member Function Documentation

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

Adds security handler to configuration of SOAP **MCC** (p. 274)

Reimplemented from **Arc::ClientHTTP** (p. 102).

6.54.3.2 `MCC* Arc::ClientSOAP::GetEntry () [inline]`

Returns entry point to SOAP MCC (p. 274) in configured chain. To initialize entry point `Load()` (p. 106) method must be called.

Reimplemented from `Arc::ClientHTTP` (p. 102).

6.54.3.3 `virtual void Arc::ClientSOAP::Load () [virtual]`

Instantiates pluggable elements according to generated configuration

Reimplemented from `Arc::ClientHTTP` (p. 102).

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

Send SOAP request with specified SOAP action and receive response.

6.54.3.5 `MCC_Status Arc::ClientSOAP::process (PayloadSOAP * request, PayloadSOAP ** response)`

Send SOAP request and receive response.

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

- ClientInterface.h

6.55 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)

6.55.1 Constructor & Destructor Documentation

6.55.1.1 Arc::ClientSOAPwithSAML2SSO::ClientSOAPwithSAML2SSO () [inline]

Constructor creates **MCC** (p. 274) chain and connects to server.

6.55.2 Member Function Documentation

6.55.2.1 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.

6.55.2.2 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)

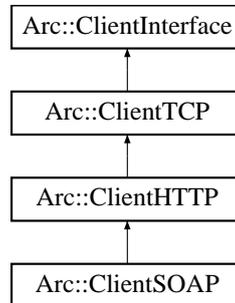
Send SOAP request and receive response.

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

- ClientSAML2SSO.h

6.56 Arc::ClientTCP Class Reference

Inheritance diagram for Arc::ClientTCP::



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

- ClientInterface.h

6.57 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="")

6.57.1 Constructor & Destructor Documentation

6.57.1.1 Arc::ClientX509Delegation::ClientX509Delegation () [inline]

Constructor creates MCC (p. 274) chain and connects to server.

6.57.2 Member Function Documentation

6.57.2.1 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.

6.57.2.2 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 acquires 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.

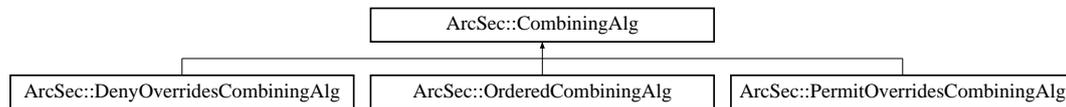
The documentation for this class was generated from the following file:

- ClientX509Delegation.h

6.58 ArcSec::CombiningAlg Class Reference

Interface for combining algorithm.

#include <CombiningAlg.h> Inheritance diagram for ArcSec::CombiningAlg::



Public Member Functions

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

6.58.1 Detailed Description

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

6.58.2 Member Function Documentation

6.58.2.1 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 CombiningAlg class.

Implemented in **ArcSec::DenyOverridesCombiningAlg** (p. 187), and **ArcSec::PermitOverridesCombiningAlg** (p. 334).

6.58.2.2 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::DenyOverridesCombiningAlg** (p. 187), and **ArcSec::PermitOverridesCombiningAlg** (p. 334).

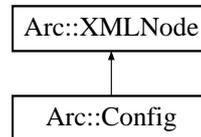
The documentation for this class was generated from the following file:

- CombiningAlg.h

6.59 Arc::Config Class Reference

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

#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)
- void **parse** (const char *filename)
- const std::string & **getFileName** (void) const
- void **setFileName** (const std::string &filename)
- void **save** (const char *filename)

6.59.1 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.

6.59.2 Constructor & Destructor Documentation

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

Creates empty XML tree

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

Loads configuration document from file 'filename'

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

Parse configuration document from memory

6.59.2.4 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.

6.59.2.5 Arc::Config::Config (long cfg_ptr_addr)

Copy constructor used by language bindings

6.59.2.6 Arc::Config::Config (const Config & cfg)

Copy constructor used by language bindings

6.59.3 Member Function Documentation**6.59.3.1 const std::string& Arc::Config::getFileName (void) const [inline]**

Gives back file name of config file or empty string if it was generated from the **XMLNode** (p. 502) subtree

6.59.3.2 void Arc::Config::parse (const char * filename)

Parse configuration document from file 'filename'

6.59.3.3 void Arc::Config::print (void)

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

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

Save to file

6.59.3.5 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

6.60 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=".")

6.60.1 Detailed Description

Wrapper around **Credential** (p. 129) handling the Confusa specifics.

6.60.2 Constructor & Destructor Documentation

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

Create a new **ConfusaCertHandler** (p. 115) for DN dn and given keysize Basically Confusa cert handler wraps around **Credential** (p. 129)

6.60.3 Member Function Documentation

6.60.3.1 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.

6.60.3.2 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

6.61 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)

6.61.1 Detailed Description

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

6.61.2 Member Function Documentation

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

Destroy a libxml2 doc representation

6.61.2.2 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.

6.61.2.3 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.

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

Construct a libxml2 doc representation from the xml file

6.61.2.5 `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.

6.61.2.6 `static std::string Arc::ConfusaParserUtils::urlencode (const std::string url) [static]`

urlencode the passed string

6.61.2.7 `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 separators, i.e. the `?` and `&` separating parameters will be preserved.

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

- `ConfusaParserUtils.h`

6.62 Arc::CountedPointer< T > Class Template Reference

Wrapper for pointer with automatic destruction and mutiple references.

```
#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
- **operator T *** (void) const

6.62.1 Detailed Description

```
template<typename T> class Arc::CountedPointer< T >
```

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

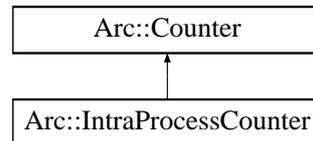
The documentation for this class was generated from the following file:

- Utils.h

6.63 Arc::Counter Class Reference

A class defining a common interface for counters.

#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::IDType resID)`

Friends

- class `CounterTicket`
- class `ExpirationReminder`

6.63.1 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(...);
```

6.63.2 Member Typedef Documentation

6.63.2.1 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 numbers (keys) for referencing of reservations. It is used internally in counters for book keeping of reservations as well as in the **CounterTicket** (p. 126) class in order to be able to cancel and extend reservations.

6.63.3 Constructor & Destructor Documentation

6.63.3.1 Arc::Counter::Counter () [protected]

Default constructor. This is the default constructor. Since **Counter** (p. 119) is an abstract class, it should only be used by subclasses. Therefore it is protected. Furthermore, since the **Counter** (p. 119) class has no attributes, nothing needs to be initialized and thus this constructor is empty.

6.63.3.2 virtual Arc::Counter::~~Counter () [virtual]

The destructor. This is the destructor of the **Counter** (p. 119) class. Since the **Counter** (p. 119) class has no attributes, nothing needs to be cleaned up and thus the destructor is empty.

6.63.4 Member Function Documentation

6.63.4.1 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** (p. 126) that corresponds to the reservation.

Parameters:

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

Implemented in **Arc::IntraProcessCounter** (p. 245).

6.63.4.2 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** (p. 245).

6.63.4.3 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** (p. 245).

6.63.4.4 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** (p. 126) 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.

Implemented in **Arc::IntraProcessCounter** (p. 245).

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

A "relay method" for a constructor of the **CounterTicket** (p. 126) class. This method acts as a relay for one of the constructors of the **CounterTicket** (p. 126) class. That constructor is private, but needs to be accessible from the subclasses of **Counter** (p. 119) (but not from anywhere else). In order not to have to declare every possible subclass of **Counter** (p. 119) as a friend of **CounterTicket** (p. 126), only the base class **Counter** (p. 119) 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:

reservationID The identity number of the reservation corresponding to the **CounterTicket** (p. 126).

expiryTime the expiry time of the reservation corresponding to the **CounterTicket** (p. 126).

counter The **Counter** (p. 119) from which the reservation has been made.

Returns:

The counter ticket that has been created.

6.63.4.6 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.

6.63.4.7 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** (p. 246).

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

A "relay method" for the constructor of **ExpirationReminder** (p. 211). This method acts as a relay for one of the constructors of the **ExpirationReminder** (p. 211) class. That constructor is private, but needs to be accessible from the subclasses of **Counter** (p. 119) (but not from anywhere else). In order not to have to declare every possible subclass of **Counter** (p. 119) as a friend of **ExpirationReminder** (p. 211), only the base class **Counter** (p. 119) 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 **ExpirationReminder** (p. 211).

resID The identity number of the reservation corresponding to the **ExpirationReminder** (p. 211).

Returns:

The **ExpirationReminder** (p. 211) that has been created.

6.63.4.9 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.

6.63.4.10 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** (p. 246).

6.63.4.11 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 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** (p. 246).

6.63.4.12 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** (p. 126) that can be queried about the status of the reservation as well as for cancellations and extensions.

Implemented in **Arc::IntraProcessCounter** (p. 246).

6.63.4.13 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** (p. 247).

6.63.4.14 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** (p. 247).

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

- Counter.h

6.64 Arc::CounterTicket Class Reference

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

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

Public Member Functions

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

Friends

- class **Counter**

6.64.1 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** (p. 119), 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();
```

6.64.2 Constructor & Destructor Documentation

6.64.2.1 Arc::CounterTicket::CounterTicket ()

The default constructor. This is the default constructor. It creates a **CounterTicket** (p. 126) 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** (p. 119).

6.64.3 Member Function Documentation

6.64.3.1 void Arc::CounterTicket::cancel ()

Cancel a reservation. 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.

6.64.3.2 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.

6.64.3.3 bool Arc::CounterTicket::isValid ()

Returns the validity of a **CounterTicket** (p. 126). This method checks whether a **CounterTicket** (p. 126) is valid. The ticket was probably returned earlier by the `reserve()` method of a **Counter** (p. 119) but the corresponding reservation may have expired.

Returns:

The validity of the ticket.

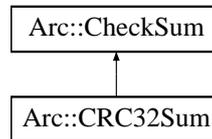
The documentation for this class was generated from the following file:

- Counter.h

6.65 Arc::CRC32Sum Class Reference

Implementation of CRC32 checksum.

#include <Checksum.h> Inheritance diagram for Arc::CRC32Sum::



6.65.1 Detailed Description

Implementation of CRC32 checksum.

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

- CheckSum.h

6.66 Arc::Credential Class Reference

Public Member Functions

- **Credential** ()
- **Credential** (int keybits)
- **Credential** (const std::string &CAfile, const std::string &CAkey, const std::string &CAserial, bool CAcreateserial, 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)
- void **AddCertExtObj** (std::string &sn, std::string &oid)
- void **LogError** (void)
- EVP_PKEY * **GetPrivKey** (void)
- EVP_PKEY * **GetPubKey** (void)
- X509 * **GetCert** (void)
- X509_REQ * **GetCertReq** (void)
- **STACK_OF** (X509)***GetCertChain**(void)
- int **GetCertNumofChain** (void)
- Credformat **getFormat** (BIO *in)
- std::string **GetDN** (void)
- std::string **GetIdentityName** (void)
- **ArcCredential::certType** **GetType** (void)
- std::string **GetProxyPolicy** (void)
- void **SetProxyPolicy** (const std::string &proxyversion, const std::string &policylang, 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)
- **Time** **GetStartTime** ()
- **Time** **GetEndTime** ()
- void **SetLifeTime** (const **Period** &period)
- void **SetStartTime** (const **Time** &start_time)
- bool **AddExtension** (std::string name, std::string data, bool crit=false)
- bool **AddExtension** (std::string name, char **binary, bool crit=false)
- bool **GenerateEECRequest** (BIO *&reqbio, BIO *&keybio, std::string dn="")
- bool **GenerateEECRequest** (std::string &reqcontent, std::string &keycontent, std::string dn="")
- bool **GenerateEECRequest** (const char *request_filename, const char *key_filename, 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 **SignEECRequest** (**Credential** *eec, const std::string &DN, BIO *outputbio)
- bool **SignEECRequest** (**Credential** *eec, const std::string &DN, std::string &content)
- bool **SignEECRequest** (**Credential** *eec, const std::string &DN, const char *filename)

Static Public Member Functions

- static void **InitProxyCertInfo** (void)

6.66.1 Constructor & Destructor Documentation

6.66.1.1 Arc::Credential::Credential ()

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

6.66.1.2 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

6.66.1.3 Arc::Credential::Credential (const std::string & *CAfile*, const std::string & *CAkey*, const std::string & *CAserial*, bool *CAcreateserial*, const std::string & *extfile*, const std::string & *extsect*, const std::string & *passphrase4key* = "")

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

6.66.1.4 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 corresponding policy language. GSI2(GSI2, GSI2_LIMITED) GSI3 and RFC (IMPERSONATION_PROXY--1.3.6.1.5.5.7.21.1, INDEPENDENT_PROXY--1.3.6.1.5.5.7.21.2, LIMITED_PROXY--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

lifetime,lifetime of proxy certificate

keybits, 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 constraining certificate signing.

6.66.1.5 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:

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

6.66.2 Member Function Documentation

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

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

6.66.2.2 bool Arc::Credential::AddExtension (std::string name, char ** binary, bool crit = false)

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** (p. ??) 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)

6.66.2.3 bool Arc::Credential::AddExtension (std::string name, 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

6.66.2.4 `bool Arc::Credential::GenerateEECRequest (const char * request_filename, const char * key_filename, std::string dn = "")`

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

6.66.2.5 `bool Arc::Credential::GenerateEECRequest (std::string & reqcontent, std::string & keycontent, std::string dn = "")`

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

6.66.2.6 `bool Arc::Credential::GenerateEECRequest (BIO *& reqbio, BIO *& keybio, 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

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

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

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

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

6.66.2.9 `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

6.66.2.10 `X509* Arc::Credential::GetCert (void)`

Get the certificate attached to this object

6.66.2.11 `int Arc::Credential::GetCertNumofChain (void)`

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

6.66.2.12 `X509_REQ* Arc::Credential::GetCertReq (void)`

Get the certificate request, if there is any

6.66.2.13 `std::string Arc::Credential::GetDN (void)`

Get the DN of the certificate attached to this object

6.66.2.14 Time Arc::Credential::GetEndTime ()

Returns validity end time of certificate or proxy

6.66.2.15 Credformat Arc::Credential::getFormat (BIO * in)

Get the certificate format, PEM PKCS12 or DER

6.66.2.16 std::string Arc::Credential::GetIdentityName (void)

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

6.66.2.17 Period Arc::Credential::GetLifeTime (void)

Returns lifetime of certificate or proxy

6.66.2.18 EVP_PKEY* Arc::Credential::GetPrivKey (void)

Get the private key attached to this object

6.66.2.19 std::string Arc::Credential::GetProxyPolicy (void)

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

6.66.2.20 EVP_PKEY* Arc::Credential::GetPubKey (void)

Get the public key attached to this object

6.66.2.21 Time Arc::Credential::GetStartTime ()

Returns validity start time of certificate or proxy

6.66.2.22 ArcCredential::certType Arc::Credential::GetType (void)

Get type of the certificate attached to this object

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

Initiate nid for proxy certificate extension

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

Inquire the certificate request from a file

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

Inquire the certificate request from a string

6.66.2.26 `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

6.66.2.27 `void Arc::Credential::LogError (void)`

Log error information related with openssl

6.66.2.28 `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

6.66.2.29 `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

6.66.2.30 `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

6.66.2.31 `bool Arc::Credential::OutputPublickey (std::string & content)`

Output the public key into string

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

Set lifetime of certificate or proxy

6.66.2.33 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 certificate

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

Set start time of certificate or proxy

6.66.2.35 bool Arc::Credential::SignEECRequest (Credential * *eec*, const std::string & *DN*, const char * *filename*)

Sign request and output the signed certificate to a file

6.66.2.36 bool Arc::Credential::SignEECRequest (Credential * *eec*, const std::string & *DN*, std::string & *content*)

Sign request and output the signed certificate to a string

6.66.2.37 bool Arc::Credential::SignEECRequest (Credential * *eec*, const std::string & *DN*, BIO * *outputbio*)

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

6.66.2.38 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

6.66.2.39 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

6.66.2.40 `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

6.66.2.41 `Arc::Credential::STACK_OF (X509)`

Get the certificate chain attached to this object

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

- Credential.h

6.67 Arc::CredentialError Class Reference

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

Public Member Functions

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

6.67.1 Detailed Description

This is an exception class that is used to handle runtime errors discovered in the **Credential** (p. 129) class.

6.67.2 Constructor & Destructor Documentation

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

This is the constructor of the **CredentialError** (p. 137) class.

Parameters:

- what* An explanation of the error.

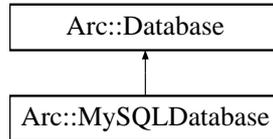
The documentation for this class was generated from the following file:

- Credential.h

6.68 Arc::Database Class Reference

Interface for calling database client library.

#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

6.68.1 Detailed Description

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

6.68.2 Constructor & Destructor Documentation

6.68.2.1 Arc::Database::Database () [inline]

Default constructor

6.68.2.2 Arc::Database::Database (std::string & server, int port) [inline]

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

6.68.2.3 Arc::Database::Database (const Database & other) [inline]

Copy constructor

6.68.2.4 virtual Arc::Database::~Database () [inline, virtual]

Destructor

6.68.3 Member Function Documentation

6.68.3.1 virtual void Arc::Database::close () [pure virtual]

Close the connection with database server

Implemented in `Arc::MySQLDatabase` (p. 300).

6.68.3.2 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` (p. 300).

6.68.3.3 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` (p. 300).

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

Get the connection status

Implemented in `Arc::MySQLDatabase` (p. 301).

6.68.3.5 virtual bool Arc::Database::shutdown () [pure virtual]

Ask database server to shutdown

Implemented in `Arc::MySQLDatabase` (p. 301).

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

- DBInterface.h

6.69 Arc::DataBuffer Class Reference

Represents set of buffers.

```
#include <DataBuffer.h>
```

Data Structures

- struct **buf_desc**
- class **checksum_desc**

Public Member Functions

- **operator bool** () const
- **DataBuffer** (unsigned int size=65536, int blocks=3)
- **DataBuffer** (**Checksum** *cksum, unsigned int size=65536, int blocks=3)
- **~DataBuffer** ()
- **bool set** (**Checksum** *cksum=NULL, unsigned int size=65536, int blocks=3)
- **int add** (**Checksum** *cksum)
- **char * operator[]** (int n)
- **bool for_read** (int &handle, unsigned int &length, bool wait)
- **bool for_read** ()
- **bool is_read** (int handle, unsigned int length, unsigned long long int offset)
- **bool is_read** (char *buf, unsigned int length, unsigned long long int offset)
- **bool for_write** (int &handle, unsigned int &length, unsigned long long int &offset, bool wait)
- **bool for_write** ()
- **bool is_written** (int handle)
- **bool is_written** (char *buf)
- **bool is_notwritten** (int handle)
- **bool is_notwritten** (char *buf)
- **void eof_read** (bool v)
- **void eof_write** (bool v)
- **void error_read** (bool v)
- **void error_write** (bool v)
- **bool eof_read** ()
- **bool eof_write** ()
- **bool error_read** ()
- **bool error_write** ()
- **bool error_transfer** ()
- **bool error** ()
- **bool wait_any** ()
- **bool wait_used** ()
- **bool checksum_valid** () const
- **const CheckSum * checksum_object** () const
- **bool wait_eof_read** ()
- **bool wait_read** ()
- **bool wait_eof_write** ()
- **bool wait_write** ()
- **bool wait_eof** ()
- **unsigned long long int eof_position** () const
- **unsigned int buffer_size** () const

Data Fields

- **DataSpeed** speed

6.69.1 Detailed Description

Represents set of buffers. This class is used used during data transfer using **DataPoint** (p. 151) classes.

6.69.2 Constructor & Destructor Documentation

6.69.2.1 Arc::DataBuffer::DataBuffer (unsigned int *size* = 65536, int *blocks* = 3)

Constructor

Parameters:

size size of every buffer in bytes.

blocks number of buffers.

6.69.2.2 Arc::DataBuffer::DataBuffer (Checksum * *cksum*, unsigned int *size* = 65536, int *blocks* = 3)

Constructor

Parameters:

size size of every buffer in bytes.

blocks number of buffers.

cksum object which will compute checksum. Should not be destroyed till **DataBuffer** (p. 140) itself.

6.69.3 Member Function Documentation

6.69.3.1 int Arc::DataBuffer::add (Checksum * *cksum*)

Add a checksum object which will compute checksum of buffer.

Parameters:

cksum object which will compute checksum. Should not be destroyed till **DataBuffer** (p. 140) itself.

Returns:

integer position in the list of checksum objects.

6.69.3.2 unsigned int Arc::DataBuffer::buffer_size () const

Returns size of buffer in object. If not initialized then this number represents size of default buffer.

6.69.3.3 const CheckSum* Arc::DataBuffer::checksum_object () const

Returns **CheckSum** (p. 96) object specified in constructor, returns NULL if index is not in list.

Parameters:

index of the checksum in question.

6.69.3.4 bool Arc::DataBuffer::checksum_valid () const

Returns true if checksum was successfully computed, returns false if index is not in list.

Parameters:

index of the checksum in question.

6.69.3.5 bool Arc::DataBuffer::eof_read ()

Returns true if object was informed about end of transfer on 'read' side.

6.69.3.6 void Arc::DataBuffer::eof_read (bool v)

Informs object if there will be no more request for 'read' buffers. v true if no more requests.

6.69.3.7 bool Arc::DataBuffer::eof_write ()

Returns true if object was informed about end of transfer on 'write' side.

6.69.3.8 void Arc::DataBuffer::eof_write (bool v)

Informs object if there will be no more request for 'write' buffers. v true if no more requests.

6.69.3.9 bool Arc::DataBuffer::error ()

Returns true if object was informed about error or internal error occurred.

6.69.3.10 void Arc::DataBuffer::error_read (bool v)

Informs object if error occurred on 'read' side.

Parameters:

v true if error.

6.69.3.11 void Arc::DataBuffer::error_write (bool *v*)

Informs object if error accured on 'write' side.

Parameters:

v true if error.

6.69.3.12 bool Arc::DataBuffer::for_read ()

Check if there are buffers which can be taken by **for_read()** (p. 143). This function checks only for buffers and does not take eof and error conditions into account.

6.69.3.13 bool Arc::DataBuffer::for_read (int & *handle*, unsigned int & *length*, bool *wait*)

Request buffer for READING INTO it.

Parameters:

handle returns buffer's number.

length returns size of buffer

wait if true and there are no free buffers, method will wait for one.

Returns:

true on success

6.69.3.14 bool Arc::DataBuffer::for_write ()

Check if there are buffers which can be taken by **for_write()** (p. 143). This function checks only for buffers and does not take eof and error conditions into account.

6.69.3.15 bool Arc::DataBuffer::for_write (int & *handle*, unsigned int & *length*, unsigned long long int & *offset*, bool *wait*)

Request buffer for WRITING FROM it.

Parameters:

handle returns buffer's number.

length returns size of buffer

wait if true and there are no free buffers, method will wait for one.

6.69.3.16 bool Arc::DataBuffer::is_notwritten (char * *buf*)

Informs object that data was NOT written from buffer (and releases buffer).

Parameters:

buf - address of buffer

6.69.3.17 `bool Arc::DataBuffer::is_notwritten (int handle)`

Informs object that data was NOT written from buffer (and releases buffer).

Parameters:

handle buffer's number.

6.69.3.18 `bool Arc::DataBuffer::is_read (char * buf, unsigned int length, unsigned long long int offset)`

Informs object that data was read into buffer.

Parameters:

buf - address of buffer

length amount of data.

offset offset in stream, file, etc.

6.69.3.19 `bool Arc::DataBuffer::is_read (int handle, unsigned int length, unsigned long long int offset)`

Informs object that data was read into buffer.

Parameters:

handle buffer's number.

length amount of data.

offset offset in stream, file, etc.

6.69.3.20 `bool Arc::DataBuffer::is_written (char * buf)`

Informs object that data was written from buffer.

Parameters:

buf - address of buffer

6.69.3.21 `bool Arc::DataBuffer::is_written (int handle)`

Informs object that data was written from buffer.

Parameters:

handle buffer's number.

6.69.3.22 `bool Arc::DataBuffer::set (Checksum * cksum = NULL, unsigned int size = 65536, int blocks = 3)`

Reinitialize buffers with different parameters.

Parameters:

size size of every buffer in bytes.

blocks number of buffers.

cksum object which will compute checksum. Should not be destroyed till **DataBuffer** (p. 140) itself.

6.69.3.23 `bool Arc::DataBuffer::wait_any ()`

Wait (max 60 sec.) till any action happens in object. Returns true if action is eof on any side.

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

- DataBuffer.h

6.70 Arc::DataCallback Class Reference

```
#include <DataCallback.h>
```

6.70.1 Detailed Description

This class is used by **DataHandle** (p. 147) to report missing space on local filesystem. One of 'cb' functions here will be called if operation initiated by `DataHandle::start_reading` runs out of disk space.

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

- `DataCallback.h`

6.71 Arc::DataHandle Class Reference

This class is a wrapper around the **DataPoint** (p. 151) class.

```
#include <DataHandle.h>
```

6.71.1 Detailed Description

This class is a wrapper around the **DataPoint** (p. 151) class. It simplifies the construction, use and destruction of **DataPoint** (p. 151) objects.

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

- DataHandle.h

6.72 Arc::DataMover Class Reference

```
#include <DataMover.h>
```

Public Member Functions

- **DataMover** ()
- **~DataMover** ()
- **DataStatus Transfer** (**DataPoint** &source, **DataPoint** &destination, **FileCache** &cache, const **URLMap** &map, callback cb=NULL, void *arg=NULL, const char *prefix=NULL)
- **DataStatus Transfer** (**DataPoint** &source, **DataPoint** &destination, **FileCache** &cache, const **URLMap** &map, unsigned long long int min_speed, time_t min_speed_time, unsigned long long int min_average_speed, time_t max_inactivity_time, callback cb=NULL, void *arg=NULL, const char *prefix=NULL)
- bool **verbose** ()
- void **verbose** (bool)
- void **verbose** (const std::string &prefix)
- bool **retry** ()
- void **retry** (bool)
- void **secure** (bool)
- void **passive** (bool)
- void **force_to_meta** (bool)
- bool **checks** ()
- void **checks** (bool v)
- void **set_default_min_speed** (unsigned long long int min_speed, time_t min_speed_time)
- void **set_default_min_average_speed** (unsigned long long int min_average_speed)
- void **set_default_max_inactivity_time** (time_t max_inactivity_time)

6.72.1 Detailed Description

A purpose of this class is to provide an interface that moves data between two locations specified by URLs. It's main action is represented by methods **DataMover::Transfer** (p. 149). Instance represents only attributes used during transfer.

6.72.2 Member Function Documentation

6.72.2.1 void Arc::DataMover::checks (bool v)

Set if to make check for existance of remote file (and probably other checks too) before initiating 'reading' and 'writing' operations.

Parameters:

- v true if allowed (default is true).

6.72.2.2 bool Arc::DataMover::checks ()

Check if check for existance of remote file is done before initiating 'reading' and 'writing' operations.

6.72.2.3 void Arc::DataMover::force_to_meta (bool)

Set if file should be transferred and registered even if such LFN is already registered and source is not one of registered locations.

6.72.2.4 void Arc::DataMover::secure (bool)

Set if high level of security (encryption) will be used during transfer if available.

6.72.2.5 void Arc::DataMover::set_default_max_inactivity_time (time_t max_inactivity_time) [inline]

Set maximal allowed time for waiting for any data. For more information see description of **DataSpeed** (p. 167) class.

6.72.2.6 void Arc::DataMover::set_default_min_average_speed (unsigned long long int min_average_speed) [inline]

Set minimal allowed average transfer speed (default is 0 averaged over whole time of transfer. For more information see description of **DataSpeed** (p. 167) class.

6.72.2.7 void Arc::DataMover::set_default_min_speed (unsigned long long int min_speed, time_t min_speed_time) [inline]

Set minimal allowed transfer speed (default is 0) to 'min_speed'. If speed drops below for time longer than 'min_speed_time' error is raised. For more information see description of **DataSpeed** (p. 167) class.

6.72.2.8 DataStatus Arc::DataMover::Transfer (DataPoint & source, DataPoint & destination, FileCache & cache, const URLMap & map, unsigned long long int min_speed, time_t min_speed_time, unsigned long long int min_average_speed, time_t max_inactivity_time, callback cb = NULL, void * arg = NULL, const char * prefix = NULL)

Initiates transfer from 'source' to 'destination'.

Parameters:

min_speed minimal allowed current speed.

min_speed_time time for which speed should be less than 'min_speed' before transfer fails.

min_average_speed minimal allowed average speed.

max_inactivity_time time for which should be no activity before transfer fails.

6.72.2.9 DataStatus Arc::DataMover::Transfer (DataPoint & source, DataPoint & destination, FileCache & cache, const URLMap & map, callback cb = NULL, void * arg = NULL, const char * prefix = NULL)

Initiates transfer from 'source' to 'destination'.

Parameters:

source source URL (p. 435).

destination destination **URL** (p. 435).

cache controls caching of downloaded files (if destination url is "file://"). If caching is not needed default constructor FileCache() can be used.

map **URL** (p. 435) mapping/conversion table (for 'source' **URL** (p. 435)).

cb if not NULL, transfer is done in separate thread and 'cb' is called after transfer completes/fails.

arg passed to 'cb'.

prefix if 'verbose' is activated this information will be printed before each line representing current transfer status.

6.72.2.10 void Arc::DataMover::verbose (const std::string & *prefix*)

Activate printing information about transfer status.

Parameters:

prefix use this string if 'prefix' in **DataMover::Transfer** (p. 149) is NULL.

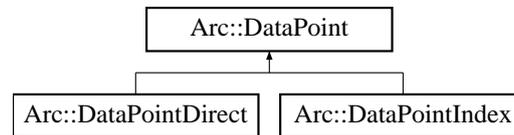
The documentation for this class was generated from the following file:

- DataMover.h

6.73 Arc::DataPoint Class Reference

This base class is an abstraction of [URL](#) (p. 435).

#include <DataPoint.h> Inheritance diagram for Arc::DataPoint::



Public Member Functions

- **DataPoint** (const **URL** &url)
- virtual ~**DataPoint** ()
- virtual const **URL** & **GetURL** () const
- virtual std::string **str** () const
- virtual **operator bool** () const
- virtual bool **operator!** () const
- virtual **DataStatus StartReading** (**DataBuffer** &buffer)=0
- virtual **DataStatus StartWriting** (**DataBuffer** &buffer, **DataCallback** *space_cb=NULL)=0
- virtual **DataStatus StopReading** ()=0
- virtual **DataStatus StopWriting** ()=0
- virtual **DataStatus Check** ()=0
- virtual **DataStatus Remove** ()=0
- virtual **DataStatus ListFiles** (std::list< **FileInfo** > &files, bool long_list=false, bool resolve=false, bool metadata=false)=0
- virtual void **ReadOutOfOrder** (bool v)=0
- virtual bool **WriteOutOfOrder** ()=0
- virtual void **SetAdditionalChecks** (bool v)=0
- virtual bool **GetAdditionalChecks** () const =0
- virtual void **SetSecure** (bool v)=0
- virtual bool **GetSecure** () const =0
- virtual void **Passive** (bool v)=0
- virtual **DataStatus GetFailureReason** (void) const
- virtual void **Range** (unsigned long long int start=0, unsigned long long int end=0)=0
- virtual **DataStatus Resolve** (bool source)=0
- virtual bool **Registered** () const =0
- virtual **DataStatus PreRegister** (bool replication, bool force=false)=0
- virtual **DataStatus PostRegister** (bool replication)=0
- virtual **DataStatus PreUnregister** (bool replication)=0
- virtual **DataStatus Unregister** (bool all)=0
- virtual bool **CheckSize** () const
- virtual void **SetSize** (const unsigned long long int val)
- virtual unsigned long long int **GetSize** () const
- virtual bool **CheckChecksum** () const
- virtual void **SetChecksum** (const std::string &val)
- virtual const std::string & **GetChecksum** () const
- virtual bool **CheckCreated** () const

- virtual void **SetCreated** (const **Time** &val)
- virtual const **Time** & **GetCreated** () const
- virtual bool **CheckValid** () const
- virtual void **SetValid** (const **Time** &val)
- virtual const **Time** & **GetValid** () const
- virtual long long int **BufSize** () const =0
- virtual int **BufNum** () const =0
- virtual bool **Cache** () const
- virtual bool **Local** () const =0
- virtual int **GetTries** () const
- virtual void **SetTries** (const int n)
- virtual bool **NextTry** (void)
- virtual bool **IsIndex** () const =0
- virtual bool **AcceptsMeta** ()=0
- virtual bool **ProvidesMeta** ()=0
- virtual void **SetMeta** (const **DataPoint** &p)
- virtual bool **CompareMeta** (const **DataPoint** &p) const
- virtual const **URL** & **CurrentLocation** () const =0
- virtual const std::string & **CurrentLocationMetadata** () const =0
- virtual bool **NextLocation** ()=0
- virtual bool **LocationValid** () const =0
- virtual bool **HaveLocations** () const =0
- virtual **DataStatus** **AddLocation** (const **URL** &url, const std::string &meta)=0
- virtual **DataStatus** **RemoveLocation** ()=0
- virtual **DataStatus** **RemoveLocations** (const **DataPoint** &p)=0
- void **AssignCredentials** (const std::string &proxyPath, const std::string &certificatePath, const std::string &keyPath, const std::string &caCertificatesDir)
- void **AssignCredentials** (const **XMLNode** &node)
- void **ApplySecurity** (**MCCConfig** &cfg) const

6.73.1 Detailed Description

This base class is an abstraction of **URL** (p. 435). Specializations should be provided for different kind of direct access URLs (`file://`, `ftp://`, `gsiftp://`, `http://`, `https://`, `httpg://`, ...) or indexing service URLs (`rls://`, `lfc://`, ...). **DataPoint** (p. 151) provides means to resolve an indexing service **URL** (p. 435) into multiple URLs and to loop through them.

6.73.2 Member Function Documentation

6.73.2.1 virtual **DataStatus** **Arc::DataPoint::AddLocation** (const **URL** & *url*, const std::string & *meta*) [pure virtual]

Add **URL** (p. 435) to list.

Parameters:

- url* Location **URL** (p. 435) to add.
- meta* Location meta information.

Implemented in **Arc::DataPointDirect** (p. 159), and **Arc::DataPointIndex** (p. 163).

6.73.2.2 void Arc::DataPoint::ApplySecurity (MCCConfig & *cfg*) const [inline]

Apply authentication credentials. This method applies the member credentials to the passed **MCCConfig** (p. 279) object reference.

Parameters:

cfg The member credentials are applied to this object reference.

References Arc::BaseConfig::AddCADir(), Arc::BaseConfig::AddCertificate(), Arc::BaseConfig::AddPrivateKey(), and Arc::BaseConfig::AddProxy().

6.73.2.3 virtual DataStatus Arc::DataPoint::Check () [pure virtual]

Query (p. 356) the **DataPoint** (p. 151) to check if object is accessible. If possible this method will also try to provide meta information about the object.

Implemented in **Arc::DataPointIndex** (p. 163).

6.73.2.4 virtual bool Arc::DataPoint::CompareMeta (const DataPoint & *p*) const [virtual]

Compare meta information from another object. Undefined values are not used for comparison.

Parameters:

p object to which to compare.

6.73.2.5 virtual const std::string& Arc::DataPoint::CurrentLocationMetadata () const [pure virtual]

Returns meta information used to create current **URL** (p. 435). Usage differs between different indexing services.

Implemented in **Arc::DataPointDirect** (p. 159), and **Arc::DataPointIndex** (p. 163).

6.73.2.6 virtual DataStatus Arc::DataPoint::GetFailureReason (void) const [virtual]

Returns reason of transfer failure, as reported by callbacks. This could be different from the failure returned by the methods themselves.

6.73.2.7 virtual DataStatus Arc::DataPoint::ListFiles (std::list< FileInfo > & *files*, bool *long_list* = false, bool *resolve* = false, bool *metadata* = false) [pure virtual]

List file(s). If the **DataPoint** (p. 151) represents a directory its contents will be listed.

Parameters:

files will contain list of file names and optionally their attributes.

longlist if true, list additional properties of each file.

resolve if true, resolve physical locations (relevant for indexing services only).

6.73.2.8 virtual bool Arc::DataPoint::NextLocation () [pure virtual]

Switch to next location in list of URLs. At last location switch to first if number of allowed retries is not exceeded. Returns false if no retries left.

Implemented in **Arc::DataPointDirect** (p. 159), and **Arc::DataPointIndex** (p. 163).

6.73.2.9 virtual bool Arc::DataPoint::NextTry (void) [virtual]

Decrease number of retries left. Returns false if no retries left.

6.73.2.10 virtual void Arc::DataPoint::Passive (bool v) [pure virtual]

Request passive transfers for FTP-like protocols.

Parameters:

true to request.

Implemented in **Arc::DataPointDirect** (p. 159), and **Arc::DataPointIndex** (p. 163).

6.73.2.11 virtual DataStatus Arc::DataPoint::PostRegister (bool replication) [pure virtual]

Index **Service** (p. 404) postregistration. Used for same purpose as PreRegister. Should be called after actual transfer of file successfully finished.

Parameters:

replication if true, the file is being replicated between two locations registered in Indexing **Service** (p. 404) under same name.

Implemented in **Arc::DataPointDirect** (p. 159).

6.73.2.12 virtual DataStatus Arc::DataPoint::PreRegister (bool replication, bool force = false) [pure virtual]

Index service preregistration. This function registers the physical location of a file into an indexing service. It should be called *before* the actual transfer to that location happens.

Parameters:

replication if true, the file is being replicated between two locations registered in the indexing service under same name.

force if true, perform registration of a new file even if it already exists. Should be used to fix failures in Indexing **Service** (p. 404).

Implemented in **Arc::DataPointDirect** (p. 160).

6.73.2.13 virtual DataStatus Arc::DataPoint::PreUnregister (bool replication) [pure virtual]

Index **Service** (p. 404) preunregistration. Should be called if file transfer failed. It removes changes made by PreRegister.

Parameters:

replication if true, the file is being replicated between two locations registered in Indexing Service (p. 404) under same name.

Implemented in **Arc::DataPointDirect** (p. 160).

6.73.2.14 virtual bool Arc::DataPoint::ProvidesMeta () [pure virtual]

If endpoint can provide at least some meta information directly.

Implemented in **Arc::DataPointDirect** (p. 160), and **Arc::DataPointIndex** (p. 163).

6.73.2.15 virtual void Arc::DataPoint::Range (unsigned long long int start = 0, unsigned long long int end = 0) [pure virtual]

Set range of bytes to retrieve. Default values correspond to whole file.

Implemented in **Arc::DataPointDirect** (p. 160), and **Arc::DataPointIndex** (p. 164).

6.73.2.16 virtual void Arc::DataPoint::ReadOutOfOrder (bool v) [pure virtual]

Allow/disallow **DataPoint** (p. 151) to produce scattered data during reading* operation.

Parameters:

v true if allowed (default is false).

Implemented in **Arc::DataPointDirect** (p. 160), and **Arc::DataPointIndex** (p. 164).

6.73.2.17 virtual bool Arc::DataPoint::Registered () const [pure virtual]

Check if file is registered in Indexing Service (p. 404). Proper value is obtainable only after Resolve.

Implemented in **Arc::DataPointDirect** (p. 160), and **Arc::DataPointIndex** (p. 164).

6.73.2.18 virtual DataStatus Arc::DataPoint::Resolve (bool source) [pure virtual]

Resolves index service URL (p. 435) into list of ordinary URLs. Also obtains meta information about the file.

Parameters:

source true if **DataPoint** (p. 151) object represents source of information.

Implemented in **Arc::DataPointDirect** (p. 161).

6.73.2.19 virtual void Arc::DataPoint::SetAdditionalChecks (bool v) [pure virtual]

Allow/disallow additional checks. Check for existence of remote file (and probably other checks too) before initiating reading and writing operations.

Parameters:

v true if allowed (default is true).

Implemented in **Arc::DataPointDirect** (p. 161), and **Arc::DataPointIndex** (p. 164).

6.73.2.20 virtual void Arc::DataPoint::SetMeta (const DataPoint & p) [virtual]

Copy meta information from another object. Already defined values are not overwritten.

Parameters:

p object from which information is taken.

6.73.2.21 virtual void Arc::DataPoint::SetSecure (bool v) [pure virtual]

Allow/disallow heavy security during data transfer.

Parameters:

v true if allowed (default depends on protocol).

Implemented in **Arc::DataPointDirect** (p. 161), and **Arc::DataPointIndex** (p. 164).

6.73.2.22 virtual DataStatus Arc::DataPoint::StartReading (DataBuffer & buffer) [pure virtual]

Start reading data from **URL** (p. 435). Separate thread to transfer data will be created. No other operation can be performed while reading is in progress.

Parameters:

buffer operation will use this buffer to put information into. Should not be destroyed before stop_
reading was called and returned.

Implemented in **Arc::DataPointIndex** (p. 164).

6.73.2.23 virtual DataStatus Arc::DataPoint::StartWriting (DataBuffer & buffer, DataCallback * space_cb = NULL) [pure virtual]

Start writing data to **URL** (p. 435). Separate thread to transfer data will be created. No other operation can be performed while writing is in progress.

Parameters:

buffer operation will use this buffer to get information from. Should not be destroyed before stop_
writing was called and returned.

space_cb callback which is called if there is not enough space to store data. May not implemented for all protocols.

Implemented in **Arc::DataPointIndex** (p. 165).

6.73.2.24 virtual DataStatus Arc::DataPoint::StopReading () [pure virtual]

Stop reading. Must be called after corresponding start_reading method, either after all data is transferred or to cancel transfer. Use buffer object to find out when data is transferred. Must return failure if any happened during transfer.

Implemented in **Arc::DataPointIndex** (p. 165).

6.73.2.25 virtual DataStatus Arc::DataPoint::StopWriting () [pure virtual]

Stop writing. Must be called after corresponding start_writing method, either after all data is transferred or to cancel transfer. Use buffer object to find out when data is transferred. Must return failure if any happened during transfer.

Implemented in **Arc::DataPointIndex** (p. 165).

6.73.2.26 virtual DataStatus Arc::DataPoint::Unregister (bool all) [pure virtual]

Index **Service** (p. 404) unregistration. Remove information about file registered in Indexing **Service** (p. 404).

Parameters:

all if true, information about file itself is (LFN) is removed. Otherwise only particular physical instance is unregistered.

Implemented in **Arc::DataPointDirect** (p. 161).

6.73.2.27 virtual bool Arc::DataPoint::WriteOutOfOrder () [pure virtual]

Returns true if **URL** (p. 435) can accept scattered data for *writing* operation.

Implemented in **Arc::DataPointDirect** (p. 161), and **Arc::DataPointIndex** (p. 165).

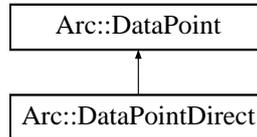
The documentation for this class was generated from the following file:

- DataPoint.h

6.74 Arc::DataPointDirect Class Reference

This is a kind of generalized file handle.

#include <DataPointDirect.h> Inheritance diagram for Arc::DataPointDirect::



Public Member Functions

- virtual bool **IsIndex** () const
- virtual long long int **BufSize** () const
- virtual int **BufNum** () const
- virtual bool **Local** () const
- virtual void **ReadOutOfOrder** (bool v)
- virtual bool **WriteOutOfOrder** ()
- virtual void **SetAdditionalChecks** (bool v)
- virtual bool **GetAdditionalChecks** () const
- virtual void **SetSecure** (bool v)
- virtual bool **GetSecure** () const
- virtual void **Passive** (bool v)
- virtual void **Range** (unsigned long long int start=0, unsigned long long int end=0)
- virtual **DataStatus Resolve** (bool source)
- virtual bool **Registered** () const
- virtual **DataStatus PreRegister** (bool replication, bool force=false)
- virtual **DataStatus PostRegister** (bool replication)
- virtual **DataStatus PreUnregister** (bool replication)
- virtual **DataStatus Unregister** (bool all)
- virtual bool **AcceptsMeta** ()
- virtual bool **ProvidesMeta** ()
- virtual const **URL & CurrentLocation** () const
- virtual const std::string & **CurrentLocationMetadata** () const
- virtual bool **NextLocation** ()
- virtual bool **LocationValid** () const
- virtual bool **HaveLocations** () const
- virtual **DataStatus AddLocation** (const **URL** &url, const std::string &meta)
- virtual **DataStatus RemoveLocation** ()

6.74.1 Detailed Description

This is a kind of generalized file handle. Differently from file handle it does not support operations read() and write(). Instead it initiates operation and uses object of class **DataBuffer** (p. 140) to pass actual data. It also provides other operations like querying parameters of remote object. It is used by higher-level classes DataMove and DataMovePar to provide data transfer service for application.

6.74.2 Member Function Documentation

6.74.2.1 virtual DataStatus Arc::DataPointDirect::AddLocation (const URL & *url*, const std::string & *meta*) [virtual]

Add **URL** (p. 435) to list.

Parameters:

url Location **URL** (p. 435) to add.

meta Location meta information.

Implements **Arc::DataPoint** (p. 152).

6.74.2.2 virtual const std::string& Arc::DataPointDirect::CurrentLocationMetadata () const [virtual]

Returns meta information used to create current **URL** (p. 435). Usage differs between different indexing services.

Implements **Arc::DataPoint** (p. 153).

6.74.2.3 virtual bool Arc::DataPointDirect::NextLocation () [virtual]

Switch to next location in list of URLs. At last location switch to first if number of allowed retries is not exceeded. Returns false if no retries left.

Implements **Arc::DataPoint** (p. 154).

6.74.2.4 virtual void Arc::DataPointDirect::Passive (bool *v*) [virtual]

Request passive transfers for FTP-like protocols.

Parameters:

true to request.

Implements **Arc::DataPoint** (p. 154).

6.74.2.5 virtual DataStatus Arc::DataPointDirect::PostRegister (bool *replication*) [virtual]

Index **Service** (p. 404) postregistration. Used for same purpose as PreRegister. Should be called after actual transfer of file successfully finished.

Parameters:

replication if true, the file is being replicated between two locations registered in Indexing **Service** (p. 404) under same name.

Implements **Arc::DataPoint** (p. 154).

6.74.2.6 virtual `DataStatus Arc::DataPointDirect::PreRegister (bool replication, bool force = false) [virtual]`

Index service preregistration. This function registers the physical location of a file into an indexing service. It should be called *before* the actual transfer to that location happens.

Parameters:

replication if true, the file is being replicated between two locations registered in the indexing service under same name.

force if true, perform registration of a new file even if it already exists. Should be used to fix failures in Indexing **Service** (p. 404).

Implements **Arc::DataPoint** (p. 154).

6.74.2.7 virtual `DataStatus Arc::DataPointDirect::PreUnregister (bool replication) [virtual]`

Index **Service** (p. 404) preunregistration. Should be called if file transfer failed. It removes changes made by PreRegister.

Parameters:

replication if true, the file is being replicated between two locations registered in Indexing **Service** (p. 404) under same name.

Implements **Arc::DataPoint** (p. 154).

6.74.2.8 virtual `bool Arc::DataPointDirect::ProvidesMeta () [virtual]`

If endpoint can provide at least some meta information directly.

Implements **Arc::DataPoint** (p. 155).

6.74.2.9 virtual `void Arc::DataPointDirect::Range (unsigned long long int start = 0, unsigned long long int end = 0) [virtual]`

Set range of bytes to retrieve. Default values correspond to whole file.

Implements **Arc::DataPoint** (p. 155).

6.74.2.10 virtual `void Arc::DataPointDirect::ReadOutOfOrder (bool v) [virtual]`

Allow/disallow **DataPoint** (p. 151) to produce scattered data during reading* operation.

Parameters:

v true if allowed (default is false).

Implements **Arc::DataPoint** (p. 155).

6.74.2.11 virtual `bool Arc::DataPointDirect::Registered () const [virtual]`

Check if file is registered in Indexing **Service** (p. 404). Proper value is obtainable only after Resolve.

Implements **Arc::DataPoint** (p. 155).

6.74.2.12 virtual DataStatus Arc::DataPointDirect::Resolve (bool *source*) [virtual]

Resolves index service **URL** (p. 435) into list of ordinary URLs. Also obtains meta information about the file.

Parameters:

source true if **DataPoint** (p. 151) object represents source of information.

Implements **Arc::DataPoint** (p. 155).

6.74.2.13 virtual void Arc::DataPointDirect::SetAdditionalChecks (bool *v*) [virtual]

Allow/disallow additional checks. Check for existence of remote file (and probably other checks too) before initiating reading and writing operations.

Parameters:

v true if allowed (default is true).

Implements **Arc::DataPoint** (p. 155).

6.74.2.14 virtual void Arc::DataPointDirect::SetSecure (bool *v*) [virtual]

Allow/disallow heavy security during data transfer.

Parameters:

v true if allowed (default depends on protocol).

Implements **Arc::DataPoint** (p. 156).

6.74.2.15 virtual DataStatus Arc::DataPointDirect::Unregister (bool *all*) [virtual]

Index **Service** (p. 404) unregistration. Remove information about file registered in Indexing **Service** (p. 404).

Parameters:

all if true, information about file itself is (LFN) is removed. Otherwise only particular physical instance is unregistered.

Implements **Arc::DataPoint** (p. 157).

6.74.2.16 virtual bool Arc::DataPointDirect::WriteOutOfOrder () [virtual]

Returns true if **URL** (p. 435) can accept scattered data for *writing* operation.

Implements **Arc::DataPoint** (p. 157).

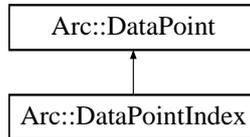
The documentation for this class was generated from the following file:

- DataPointDirect.h

6.75 Arc::DataPointIndex Class Reference

Complements **DataPoint** (p. 151) with attributes common for Indexing **Service** (p. 404) URLs.

#include <DataPointIndex.h>Inheritance diagram for Arc::DataPointIndex::



Public Member Functions

- virtual const **URL & CurrentLocation** () const
- virtual const std::string & **CurrentLocationMetadata** () const
- virtual bool **NextLocation** ()
- virtual bool **LocationValid** () const
- virtual bool **HaveLocations** () const
- virtual **DataStatus RemoveLocation** ()
- virtual **DataStatus AddLocation** (const **URL** &url, const std::string &meta)
- virtual bool **IsIndex** () const
- virtual bool **AcceptsMeta** ()
- virtual bool **ProvidesMeta** ()
- virtual bool **Registered** () const
- virtual void **SetTries** (const int n)
- virtual long long int **BufSize** () const
- virtual int **BufNum** () const
- virtual bool **Local** () const
- virtual **DataStatus StartReading** (**DataBuffer** &buffer)
- virtual **DataStatus StartWriting** (**DataBuffer** &buffer, **DataCallback** *space_cb=NULL)
- virtual **DataStatus StopReading** ()
- virtual **DataStatus StopWriting** ()
- virtual **DataStatus Check** ()
- virtual **DataStatus Remove** ()
- virtual void **ReadOutOfOrder** (bool v)
- virtual bool **WriteOutOfOrder** ()
- virtual void **SetAdditionalChecks** (bool v)
- virtual bool **GetAdditionalChecks** () const
- virtual void **SetSecure** (bool v)
- virtual bool **GetSecure** () const
- virtual void **Passive** (bool v)
- virtual void **Range** (unsigned long long int start=0, unsigned long long int end=0)

6.75.1 Detailed Description

Complements **DataPoint** (p. 151) with attributes common for Indexing **Service** (p. 404) URLs. It should never be used directly. Instead inherit from it to provide a class for specific a Indexing **Service** (p. 404).

6.75.2 Member Function Documentation

6.75.2.1 virtual DataStatus Arc::DataPointIndex::AddLocation (const URL & *url*, const std::string & *meta*) [virtual]

Add **URL** (p. 435) to list.

Parameters:

url Location **URL** (p. 435) to add.

meta Location meta information.

Implements **Arc::DataPoint** (p. 152).

6.75.2.2 virtual DataStatus Arc::DataPointIndex::Check () [virtual]

Query (p. 356) the **DataPoint** (p. 151) to check if object is accessible. If possible this method will also try to provide meta information about the object.

Implements **Arc::DataPoint** (p. 153).

6.75.2.3 virtual const std::string& Arc::DataPointIndex::CurrentLocationMetadata () const [virtual]

Returns meta information used to create current **URL** (p. 435). Usage differs between different indexing services.

Implements **Arc::DataPoint** (p. 153).

6.75.2.4 virtual bool Arc::DataPointIndex::NextLocation () [virtual]

Switch to next location in list of URLs. At last location switch to first if number of allowed retries is not exceeded. Returns false if no retries left.

Implements **Arc::DataPoint** (p. 154).

6.75.2.5 virtual void Arc::DataPointIndex::Passive (bool *v*) [virtual]

Request passive transfers for FTP-like protocols.

Parameters:

true to request.

Implements **Arc::DataPoint** (p. 154).

6.75.2.6 virtual bool Arc::DataPointIndex::ProvidesMeta () [virtual]

If endpoint can provide at least some meta information directly.

Implements **Arc::DataPoint** (p. 155).

6.75.2.7 virtual void Arc::DataPointIndex::Range (unsigned long long int *start* = 0, unsigned long long int *end* = 0) [virtual]

Set range of bytes to retrieve. Default values correspond to whole file.

Implements **Arc::DataPoint** (p. 155).

6.75.2.8 virtual void Arc::DataPointIndex::ReadOutOfOrder (bool *v*) [virtual]

Allow/disallow **DataPoint** (p. 151) to produce scattered data during reading* operation.

Parameters:

v true if allowed (default is false).

Implements **Arc::DataPoint** (p. 155).

6.75.2.9 virtual bool Arc::DataPointIndex::Registered () const [virtual]

Check if file is registered in Indexing **Service** (p. 404). Proper value is obtainable only after Resolve.

Implements **Arc::DataPoint** (p. 155).

6.75.2.10 virtual void Arc::DataPointIndex::SetAdditionalChecks (bool *v*) [virtual]

Allow/disallow additional checks. Check for existence of remote file (and probably other checks too) before initiating reading and writing operations.

Parameters:

v true if allowed (default is true).

Implements **Arc::DataPoint** (p. 155).

6.75.2.11 virtual void Arc::DataPointIndex::SetSecure (bool *v*) [virtual]

Allow/disallow heavy security during data transfer.

Parameters:

v true if allowed (default depends on protocol).

Implements **Arc::DataPoint** (p. 156).

6.75.2.12 virtual DataStatus Arc::DataPointIndex::StartReading (DataBuffer & *buffer*) [virtual]

Start reading data from **URL** (p. 435). Separate thread to transfer data will be created. No other operation can be performed while reading is in progress.

Parameters:

buffer operation will use this buffer to put information into. Should not be destroyed before stop_-reading was called and returned.

Implements **Arc::DataPoint** (p. 156).

6.75.2.13 virtual **DataStatus** Arc::DataPointIndex::StartWriting (DataBuffer & *buffer*, DataCallback * *space_cb* = NULL) [virtual]

Start writing data to **URL** (p. 435). Separate thread to transfer data will be created. No other operation can be performed while writing is in progress.

Parameters:

buffer operation will use this buffer to get information from. Should not be destroyed before stop_writing was called and returned.

space_cb callback which is called if there is not enough space to store data. May not implemented for all protocols.

Implements **Arc::DataPoint** (p. 156).

6.75.2.14 virtual **DataStatus** Arc::DataPointIndex::StopReading () [virtual]

Stop reading. Must be called after corresponding start_reading method, either after all data is transferred or to cancel transfer. Use buffer object to find out when data is transferred. Must return failure if any happened during transfer.

Implements **Arc::DataPoint** (p. 157).

6.75.2.15 virtual **DataStatus** Arc::DataPointIndex::StopWriting () [virtual]

Stop writing. Must be called after corresponding start_writing method, either after all data is transferred or to cancel transfer. Use buffer object to find out when data is transferred. Must return failure if any happened during transfer.

Implements **Arc::DataPoint** (p. 157).

6.75.2.16 virtual **bool** Arc::DataPointIndex::WriteOutOfOrder () [virtual]

Returns true if **URL** (p. 435) can accept scattered data for *writing* operation.

Implements **Arc::DataPoint** (p. 157).

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

- DataPointIndex.h

6.76 Arc::DataSourceType Class Reference

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

- JobDescription.h

6.77 Arc::DataSpeed Class Reference

Keeps track of average and instantaneous transfer speed.

```
#include <DataSpeed.h>
```

Public Member Functions

- **DataSpeed** (time_t base=DATASPEED_AVERAGING_PERIOD)
- **DataSpeed** (unsigned long long int min_speed, time_t min_speed_time, unsigned long long int min_average_speed, time_t max_inactivity_time, time_t base=DATASPEED_AVERAGING_PERIOD)
- **~DataSpeed** (void)
- void **verbose** (bool val)
- void **verbose** (const std::string &prefix)
- bool **verbose** (void)
- void **set_min_speed** (unsigned long long int min_speed, time_t min_speed_time)
- void **set_min_average_speed** (unsigned long long int min_average_speed)
- void **set_max_inactivity_time** (time_t max_inactivity_time)
- void **set_base** (time_t base_=DATASPEED_AVERAGING_PERIOD)
- void **set_max_data** (unsigned long long int max=0)
- void **set_progress_indicator** (show_progress_t func=NULL)
- void **reset** (void)
- bool **transfer** (unsigned long long int n=0)
- void **hold** (bool disable)
- bool **min_speed_failure** ()
- bool **min_average_speed_failure** ()
- bool **max_inactivity_time_failure** ()
- unsigned long long int **transferred_size** (void)

6.77.1 Detailed Description

Keeps track of average and instantaneous transfer speed. Also detects data transfer inactivity and other transfer timeouts.

6.77.2 Constructor & Destructor Documentation

6.77.2.1 Arc::DataSpeed::DataSpeed (time_t *base* = DATASPEED_AVERAGING_PERIOD)

Constructor

Parameters:

base time period used to average values (default 1 minute).

6.77.2.2 `Arc::DataSpeed::DataSpeed (unsigned long long int min_speed, time_t min_speed_time, unsigned long long int min_average_speed, time_t max_inactivity_time, time_t base = DATASPEED_AVERAGING_PERIOD)`

Constructor

Parameters:

base time period used to average values (default 1 minute).

min_speed minimal allowed speed (Butes per second). If speed drops and holds below threshold for *min_speed_time*_seconds error is triggered.

min_speed_time

*min_average_speed*_ minimal average speed (Bytes per second) to trigger error. Averaged over whole current transfer time.

max_inactivity_time - if no data is passing for specified amount of time (seconds), error is triggered.

6.77.3 Member Function Documentation

6.77.3.1 `void Arc::DataSpeed::hold (bool disable)`

Turn off speed control.

Parameters:

disable true to turn off.

6.77.3.2 `void Arc::DataSpeed::set_base (time_t base = DATASPEED_AVERAGING_PERIOD)`

Set averaging time period.

Parameters:

base time period used to average values (default 1 minute).

6.77.3.3 `void Arc::DataSpeed::set_max_data (unsigned long long int max = 0)`

Set amount of data to be transfered. Used in verbose messages.

Parameters:

max amount of data in bytes.

6.77.3.4 `void Arc::DataSpeed::set_max_inactivity_time (time_t max_inactivity_time)`

Set inactivity tiemout.

Parameters:

max_inactivity_time - if no data is passing for specified amount of time (seconds), error is triggered.

6.77.3.5 void Arc::DataSpeed::set_min_average_speed (unsigned long long int *min_average_speed*)

Set minimal average speed.

Parameters:

min_average_speed minimal average speed (Bytes per second) to trigger error. Averaged over whole current transfer time.

6.77.3.6 void Arc::DataSpeed::set_min_speed (unsigned long long int *min_speed*, time_t *min_speed_time*)

Set minimal allowed speed.

Parameters:

min_speed minimal allowed speed (Bytes per second). If speed drops and holds below threshold for *min_speed_time* seconds error is triggered.

min_speed_time

6.77.3.7 void Arc::DataSpeed::set_progress_indicator (show_progress_t *func* = NULL)

Specify which external function will print verbose messages. If not specified internal one is used.

Parameters:

pointer to function which prints information.

6.77.3.8 bool Arc::DataSpeed::transfer (unsigned long long int *n* = 0)

Inform object, about amount of data has been transferred. All errors are triggered by this method. To make them work application must call this method periodically even with zero value.

Parameters:

n amount of data transferred (bytes).

6.77.3.9 void Arc::DataSpeed::verbose (const std::string & *prefix*)

Print information about current speed and amount of data.

Parameters:

'prefix' add this string at the beginning of every string.

6.77.3.10 void Arc::DataSpeed::verbose (bool *val*)

Activate printing information about current time speeds, amount of transferred data.

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

- DataSpeed.h

6.78 Arc::DataStagingType Class Reference

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

- JobDescription.h

6.79 Arc::DataStatus Class Reference

```
#include <DataStatus.h>
```

Public Types

- enum **DataStatusType** {
 - Success** = 0, **ReadAcquireError** = 1, **WriteAcquireError** = 2, **ReadResolveError** = 3,
 - WriteResolveError** = 4, **ReadStartError** = 5, **WriteStartError** = 6, **ReadError** = 7,
 - WriteError** = 8, **TransferError** = 9, **ReadStopError** = 10, **WriteStopError** = 11,
 - PreRegisterError** = 12, **PostRegisterError** = 13, **UnregisterError** = 14, **CacheError** = 15,
 - CredentialsExpiredError** = 16, **DeleteError** = 17, **NoLocationError** = 18, **LocationAlreadyExistsError** = 19,
 - NotSupportedForDirectDataPointsError** = 20, **UnimplementedError** = 21, **IsReadingError** = 22, **IsWritingError** = 23,
 - CheckError** = 24, **ListError** = 25, **NotInitializedError** = 26, **SystemError** = 27,
 - StageError** = 28, **UnknownError** = 29 }

6.79.1 Detailed Description

A class to be used for return types of all major data handling methods. It describes the outcome of the method.

6.79.2 Member Enumeration Documentation

6.79.2.1 enum Arc::DataStatus::DataStatusType

Enumerator:

- Success* Operation completed successfully.
- ReadAcquireError* Source is bad **URL** (p. 435) or can't be used due to some reason.
- WriteAcquireError* Destination is bad **URL** (p. 435) or can't be used due to some reason.
- ReadResolveError* Resolving of index service **URL** (p. 435) for source failed.
- WriteResolveError* Resolving of index service **URL** (p. 435) for destination failed.
- ReadStartError* Can't read from source.
- WriteStartError* Can't write to destination.
- ReadError* Failed while reading from source.
- WriteError* Failed while writing to destination.
- TransferError* Failed while transferring data (mostly timeout).
- ReadStopError* Failed while finishing reading from source.
- WriteStopError* Failed while finishing writing to destination.
- PreRegisterError* First stage of registration of index service **URL** (p. 435) failed.
- PostRegisterError* Last stage of registration of index service **URL** (p. 435) failed.
- UnregisterError* Unregistration of index service **URL** (p. 435) failed.

CacheError Error in caching procedure.

CredentialsExpiredError Error due to provided credentials are expired.

DeleteError Error deleting location or **URL** (p. 435).

NoLocationError No valid location available.

LocationAlreadyExistsError No valid location available.

NotSupportedForDirectDataPointsError Operation has no sense for this kind of **URL** (p. 435).

UnimplementedError Feature is unimplemented.

IsReadingError **DataPoint** (p. 151) is already reading.

IsWritingError **DataPoint** (p. 151) is already writing.

CheckError Access check failed.

ListError File listing failed.

NotInitializedError Object initialization failed.

SystemError Error in OS.

StageError Staging error.

UnknownError Undefined.

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

- `DataStatus.h`

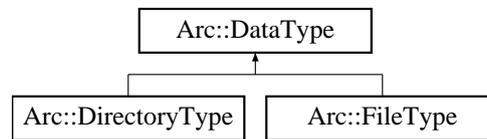
6.80 Arc::DataTargetType Class Reference

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

- JobDescription.h

6.81 Arc::DataType Class Reference

Inheritance diagram for Arc::DataType::

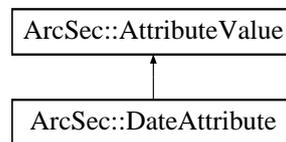


The documentation for this class was generated from the following file:

- JobDescription.h

6.82 ArcSec::DateAttribute Class Reference

Inheritance diagram for ArcSec::DateAttribute::



Public Member Functions

- virtual std::string **encode** ()
- virtual std::string **getType** ()
- virtual std::string **getId** ()

6.82.1 Member Function Documentation

6.82.1.1 virtual std::string ArcSec::DateAttribute::encode () [virtual]

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 78).

6.82.1.2 virtual std::string ArcSec::DateAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

6.82.1.3 virtual std::string ArcSec::DateAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

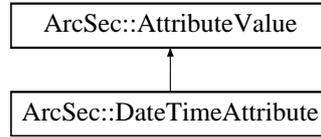
Implements **ArcSec::AttributeValue** (p. 78).

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

- DateTimeAttribute.h

6.83 ArcSec::DateTimeAttribute Class Reference

#include <DateTimeAttribute.h> Inheritance diagram for ArcSec::DateTimeAttribute::



Public Member Functions

- virtual std::string **encode** ()
- virtual std::string **getType** ()
- virtual std::string **getId** ()

6.83.1 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

6.83.2 Member Function Documentation

6.83.2.1 virtual std::string ArcSec::DateTimeAttribute::encode () [virtual]

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 78).

6.83.2.2 virtual std::string ArcSec::DateTimeAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

6.83.2.3 virtual std::string ArcSec::DateTimeAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

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

- DateTimeAttribute.h

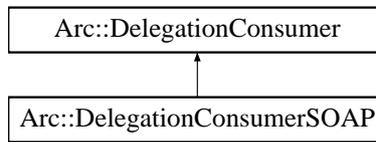
6.84 Arc::DBranch Class Reference

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

- DBranch.h

6.85 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)

6.85.1 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()** (p. 179) method for generating certificate request followed by call to **Acquire()** (p. 179) method for making complete credentials from certificate chain.

6.85.2 Constructor & Destructor Documentation

6.85.2.1 Arc::DelegationConsumer::DelegationConsumer (void)

Creates object with new private key

6.85.2.2 Arc::DelegationConsumer::DelegationConsumer (const std::string & content)

Creates object with provided private key

6.85.3 Member Function Documentation

6.85.3.1 bool Arc::DelegationConsumer::Acquire (std::string & content, std::string & identity)

Includes the functionality in Acquire(content); plus extracting the credential identity

6.85.3.2 bool Arc::DelegationConsumer::Acquire (std::string & content)

Ads private key into certificates chain in 'content' On exit content contains complete delegated credentials.

6.85.3.3 bool Arc::DelegationConsumer::Backup (std::string & content)

Stores content of this object into a string

6.85.3.4 bool Arc::DelegationConsumer::Generate (void) [protected]

Private key

6.85.3.5 const std::string& Arc::DelegationConsumer::ID (void)

Return identifier of this object - not implemented

6.85.3.6 void Arc::DelegationConsumer::LogError (void) [protected]

Creates private key

6.85.3.7 bool Arc::DelegationConsumer::Request (std::string & content)

Make X509 certificate request from internal private key

6.85.3.8 bool Arc::DelegationConsumer::Restore (const std::string & content)

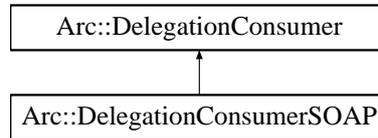
Restores content of object from string

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

- DelegationInterface.h

6.86 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, SOAPEnvelope &out)
- bool **UpdateCredentials** (std::string &credentials, const SOAPEnvelope &in, SOAPEnvelope &out)
- bool **UpdateCredentials** (std::string &credentials, std::string &identity, const SOAPEnvelope &in, SOAPEnvelope &out)
- bool **DelegatedToken** (std::string &credentials, const XMLNode &token)

6.86.1 Detailed Description

This class extends **DelegationConsumer** (p. 178) to support SOAP message exchange. Implements WS interface <http://www.nordugrid.org/schemas/delegation> described in delegation.wsdl.

6.86.2 Constructor & Destructor Documentation

6.86.2.1 Arc::DelegationConsumerSOAP::DelegationConsumerSOAP (void)

Creates object with new private key

6.86.2.2 Arc::DelegationConsumerSOAP::DelegationConsumerSOAP (const std::string &content)

Creates object with specified private key

6.86.3 Member Function Documentation

6.86.3.1 bool Arc::DelegationConsumerSOAP::DelegateCredentialsInit (const std::string &id, const SOAPEnvelope &in, SOAPEnvelope &out)

Process SOAP message which starts delagation. 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.

6.86.3.2 `bool Arc::DelegationConsumerSOAP::DelegatedToken (std::string & credentials, const XMLNode & token)`

Similar to UpdateCredentials but takes only DelegatedToken XML element

6.86.3.3 `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

6.86.3.4 `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.

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

- DelegationInterface.h

6.87 Arc::DelegationContainerSOAP Class Reference

```
#include <DelegationInterface.h>
```

Public Member Functions

- bool **DelegateCredentialsInit** (const SOAPEnvelope &in, SOAPEnvelope &out)
- bool **UpdateCredentials** (std::string &credentials, const SOAPEnvelope &in, SOAPEnvelope &out)
- bool **DelegatedToken** (std::string &credentials, const XMLNode &token)

Protected Attributes

- int **max_size_**
- int **max_duration_**
- int **max_usage_**
- bool **context_lock_**
- bool **restricted_**

6.87.1 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** (p. 180) with identifier included in SOAP message used to route execution to one of managed **DelegationConsumerSOAP** (p. 180) instances.

6.87.2 Member Function Documentation

6.87.2.1 bool Arc::DelegationContainerSOAP::DelegateCredentialsInit (const SOAPEnvelope &in, SOAPEnvelope &out)

See **DelegationConsumerSOAP::DelegateCredentialsInit** (p. 180)

6.87.2.2 bool Arc::DelegationContainerSOAP::DelegatedToken (std::string &credentials, const XMLNode &token)

See **DelegationConsumerSOAP::DelegatedToken** (p. 181)

6.87.2.3 bool Arc::DelegationContainerSOAP::UpdateCredentials (std::string &credentials, const SOAPEnvelope &in, SOAPEnvelope &out)

See **DelegationConsumerSOAP::UpdateCredentials** (p. 181)

6.87.3 Field Documentation

6.87.3.1 bool Arc::DelegationContainerSOAP::context_lock_ [**protected**]

If true delegation consumer is deleted when connection context is destroyed

6.87.3.2 int Arc::DelegationContainerSOAP::max_duration_ [protected]

Lifetime of unused delegation consumer

6.87.3.3 int Arc::DelegationContainerSOAP::max_size_ [protected]

Max. number of delegation consumers

6.87.3.4 int Arc::DelegationContainerSOAP::max_usage_ [protected]

Max. times same delegation consumer may accept credentials

6.87.3.5 bool Arc::DelegationContainerSOAP::restricted_ [protected]

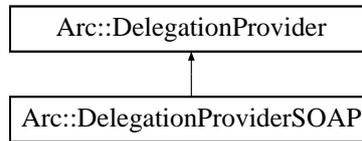
If true all delegation phases must be performed by same identity

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

- DelegationInterface.h

6.88 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())

6.88.1 Detailed Description

A provider of delegated credentials. During delegation procedure this class generates new credential to be used in proxy/delegated credential.

6.88.2 Constructor & Destructor Documentation

6.88.2.1 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.

6.88.2.2 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.

6.88.3 Member Function Documentation

6.88.3.1 std::string Arc::DelegationProvider::Delegate (const std::string & request, const DelegationRestrictions & restrictions = DelegationRestrictions ())

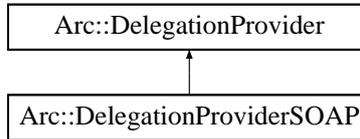
Perform delegation. Takes X509 certificate request and creates proxy credentials excluding private key. Result is then to be fed into **DelegationConsumer::Acquire** (p. 179)

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

- DelegationInterface.h

6.89 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)
- bool **DelegateCredentialsInit** (MCCInterface &mcc_interface, MessageAttributes *attributes_in, MessageAttributes *attributes_out, MessageContext *context)
- bool **UpdateCredentials** (MCCInterface &mcc_interface, MessageContext *context, const DelegationRestrictions &restrictions=DelegationRestrictions())
- bool **UpdateCredentials** (MCCInterface &mcc_interface, MessageAttributes *attributes_in, MessageAttributes *attributes_out, MessageContext *context, const DelegationRestrictions &restrictions=DelegationRestrictions())
- bool **DelegatedToken** (XMLNode &parent)
- const std::string & **ID** (void)

6.89.1 Detailed Description

Extension of **DelegationProvider** (p. 184) with SOAP exchange interface. This class is also a temporary container for intermediate information used during delegation procedure.

6.89.2 Constructor & Destructor Documentation

6.89.2.1 Arc::DelegationProviderSOAP::DelegationProviderSOAP (const std::string &credentials)

Creates instance from provided credentials. Credentials are used to sign delegated credentials.

6.89.2.2 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.

6.89.3 Member Function Documentation

6.89.3.1 `bool Arc::DelegationProviderSOAP::DelegateCredentialsInit (MCCInterface & mcc_interface, MessageAttributes * attributes_in, MessageAttributes * attributes_out, MessageContext * context)`

Extended version of `DelegateCredentialsInit(MCCInterface&,MessageContext*)` (p. 186). Additionally takes attributes for request and response message to make fine control on message processing possible.

6.89.3.2 `bool Arc::DelegationProviderSOAP::DelegateCredentialsInit (MCCInterface & mcc_interface, MessageContext * context)`

Performs `DelegateCredentialsInit` SOAP operation. As result request for delegated credentials is received by this instance and stored internally. Call to `UpdateCredentials` should follow.

6.89.3.3 `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`.

6.89.3.4 `const std::string& Arc::DelegationProviderSOAP::ID (void) [inline]`

Returns the identifier by service accepting delegated credentials. This identifier may then be used to refer to credentials stored at service.

6.89.3.5 `bool Arc::DelegationProviderSOAP::UpdateCredentials (MCCInterface & mcc_interface, MessageAttributes * attributes_in, MessageAttributes * attributes_out, MessageContext * context, const DelegationRestrictions & restrictions = DelegationRestrictions ())`

Extended version of `UpdateCredentials(MCCInterface&,MessageContext*)`. Additionally takes attributes for request and response message to make fine control on message processing possible.

6.89.3.6 `bool Arc::DelegationProviderSOAP::UpdateCredentials (MCCInterface & mcc_interface, MessageContext * context, const DelegationRestrictions & restrictions = DelegationRestrictions ())`

Performs `UpdateCredentials` SOAP operation. This concludes delegation procedure and passes delegated credentials to `DelegationConsumerSOAP` (p. 180) instance.

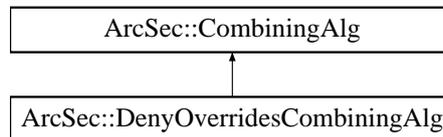
The documentation for this class was generated from the following file:

- `DelegationInterface.h`

6.90 ArcSec::DenyOverridesCombiningAlg Class Reference

Implement the "Deny-Overrides" algorithm.

#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

6.90.1 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".

6.90.2 Member Function Documentation

6.90.2.1 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.
- policies* This is a container which contains policy objects.

Returns:

The combined result according to the algorithm.

Implements ArcSec::CombiningAlg (p. 111).

6.90.2.2 virtual const std::string& ArcSec::DenyOverridesCombiningAlg::getalgId (void) const [**inline, virtual**]

Get the identifier

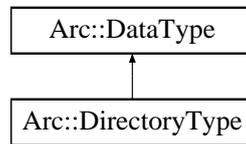
Implements ArcSec::CombiningAlg (p. 111).

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

- DenyOverridesAlg.h

6.91 Arc::DirectoryType Class Reference

Inheritance diagram for Arc::DirectoryType::



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

- JobDescription.h

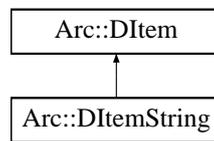
6.92 Arc::DiskSpaceRequirementType Class Reference

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

- JobDescription.h

6.93 Arc::DItem Class Reference

Inheritance diagram for Arc::DItem::

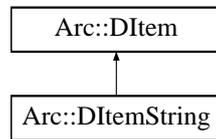


The documentation for this class was generated from the following file:

- DBranch.h

6.94 Arc::DItemString Class Reference

Inheritance diagram for Arc::DItemString::

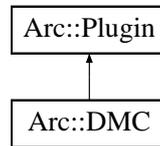


The documentation for this class was generated from the following file:

- DBranch.h

6.95 Arc::DMC Class Reference

Inheritance diagram for Arc::DMC::

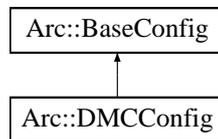


The documentation for this class was generated from the following file:

- DMC.h

6.96 Arc::DMCConfig Class Reference

Inheritance diagram for Arc::DMCConfig::



Public Member Functions

- virtual XMLNode MakeConfig (XMLNode *cfg*) const

6.96.1 Member Function Documentation

6.96.1.1 virtual XMLNode Arc::DMCConfig::MakeConfig (XMLNode *cfg*) const [virtual]

Adds configuration part corresponding to stored information into common configuration tree supplied in '*cfg*' argument.

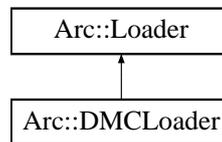
Reimplemented from **Arc::BaseConfig** (p. 85).

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

- DMC.h

6.97 Arc::DMCLoader Class Reference

Inheritance diagram for Arc::DMCLoader::



Public Member Functions

- **DMCLoader** (**Config** &cfg)
- **~DMCLoader** ()

6.97.1 Constructor & Destructor Documentation

6.97.1.1 Arc::DMCLoader::DMCLoader (Config & *cfg*)

Constructor that takes whole XML configuration and creates component chains

6.97.1.2 Arc::DMCLoader::~~DMCLoader ()

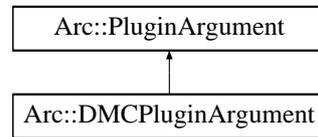
Destructor destroys all components created by constructor

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

- DMCLoader.h

6.98 Arc::DMCPluginArgument Class Reference

Inheritance diagram for Arc::DMCPluginArgument::

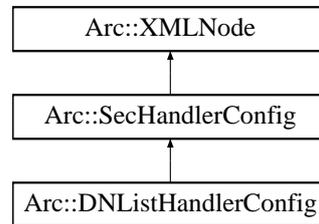


The documentation for this class was generated from the following file:

- DMC.h

6.99 Arc::DNListHandlerConfig Class Reference

Inheritance diagram for Arc::DNListHandlerConfig::

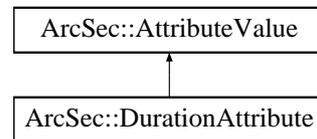


The documentation for this class was generated from the following file:

- ClientInterface.h

6.100 ArcSec::DurationAttribute Class Reference

#include <DateTimeAttribute.h>Inheritance diagram for ArcSec::DurationAttribute::



Public Member Functions

- virtual std::string **encode** ()
- virtual std::string **getType** ()
- virtual std::string **getId** ()

6.100.1 Detailed Description

Format: P??Y??M??DT??H??M??S

6.100.2 Member Function Documentation

6.100.2.1 virtual std::string ArcSec::DurationAttribute::encode () [virtual]

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 78).

6.100.2.2 virtual std::string ArcSec::DurationAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

6.100.2.3 virtual std::string ArcSec::DurationAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

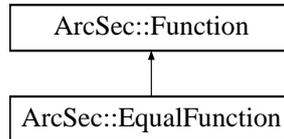
The documentation for this class was generated from the following file:

- DateTimeAttribute.h

6.101 ArcSec::EqualFunction Class Reference

Evaluate whether the two values are equal.

`#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)`

6.101.1 Detailed Description

Evaluate whether the two values are equal.

6.101.2 Member Function Documentation

6.101.2.1 `virtual std::list<AttributeValue*> ArcSec::EqualFunction::evaluate (std::list< AttributeValue * > args, bool check_id = true) [virtual]`

Evaluate a list of `AttributeValue` (p. 77) objects, and return a list of Attribute objects

Implements `ArcSec::Function` (p. 223).

6.101.2.2 `virtual AttributeValue* ArcSec::EqualFunction::evaluate (AttributeValue * arg0, AttributeValue * arg1, bool check_id = true) [virtual]`

Evaluate two `AttributeValue` (p. 77) objects, and return one `AttributeValue` (p. 77) object

Implements `ArcSec::Function` (p. 223).

6.101.2.3 `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

6.102 ArcSec::EvalResult Struct Reference

Struct to record the xml node and effect, which will be used by **Evaluator** (p. 202) to get the information about which rule/policy(in xmlnode) is satisfied.

```
#include <Result.h>
```

6.102.1 Detailed Description

Struct to record the xml node and effect, which will be used by **Evaluator** (p. 202) 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

6.103 ArcSec::EvaluationCtx Class Reference

EvaluationCtx (p. 201), in charge of storing some context information for.

```
#include <EvaluationCtx.h>
```

Public Member Functions

- **EvaluationCtx** (**Request** *request)

6.103.1 Detailed Description

EvaluationCtx (p. 201), in charge of storing some context information for.

6.103.2 Constructor & Destructor Documentation

6.103.2.1 ArcSec::EvaluationCtx::EvaluationCtx (**Request** * *request*) [**inline**]

Construct a new **EvaluationCtx** (p. 201) based on the given request

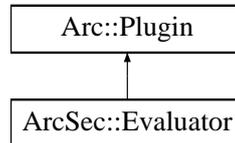
The documentation for this class was generated from the following file:

- EvaluationCtx.h

6.104 ArcSec::Evaluator Class Reference

Interface for policy evaluation. Execute the policy evaluation, based on the request and policy.

#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

6.104.1 Detailed Description

Interface for policy evaluation. Execute the policy evaluation, based on the request and policy.

6.104.2 Member Function Documentation

6.104.2.1 virtual void ArcSec::Evaluator::addPolicy (Policy *policy, const std::string &id = "") [pure virtual]

Add policy to the evaluator. **Policy** (p. 345) will be marked with id. The policy object is taken over by this instance and will be destroyed in destructor.

6.104.2.2 virtual void ArcSec::Evaluator::addPolicy (const Source &policy, const std::string &id = "") [pure virtual]

Add policy from specified source to the evaluator. **Policy** (p. 345) will be marked with id.

6.104.2.3 virtual Response* ArcSec::Evaluator::evaluate (EvaluationCtx * ctx) [protected, pure virtual]

Evaluate the request by using the **EvaluationCtx** (p. 201) object (which includes the information about request). The ctx is destroyed inside this method (why?!?!?).

6.104.2.4 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.

6.104.2.5 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.

6.104.2.6 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.

6.104.2.7 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.

6.104.2.8 virtual Response* ArcSec::Evaluator::evaluate (const Source & request) [pure virtual]

Evaluates the request by using a specified source

6.104.2.9 virtual Response* ArcSec::Evaluator::evaluate (Request * request) [pure virtual]

Evaluates the request by using a **Request** (p. 363) object. Evaluation is done till at least one of policies is satisfied.

6.104.2.10 virtual AlgFactory* ArcSec::Evaluator::getAlgFactory () [pure virtual]

Get the **AlgFactory** (p. 63) object

Referenced by ArcSec::EvaluatorContext::operator AlgFactory *().

6.104.2.11 virtual AttributeFactory* ArcSec::Evaluator::getAttrFactory () [pure virtual]

Get the **AttributeFactory** (p. 72) object

Referenced by ArcSec::EvaluatorContext::operator AttributeFactory *().

6.104.2.12 virtual FnFactory* ArcSec::Evaluator::getFnFactory () [pure virtual]

Get the **FnFactory** (p. 222) object

Referenced by ArcSec::EvaluatorContext::operator FnFactory *().

6.104.2.13 virtual const char* ArcSec::Evaluator::getName (void) const [pure virtual]

Get the name of this evaluator

6.104.2.14 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.

6.104.2.15 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.

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

- Evaluator.h

6.105 ArcSec::EvaluatorContext Class Reference

Context for evaluator. It includes the factories which will be used to create related objects.

```
#include <Evaluator.h>
```

Public Member Functions

- **operator AttributeFactory * ()**
- **operator FnFactory * ()**
- **operator AlgFactory * ()**

6.105.1 Detailed Description

Context for evaluator. It includes the factories which will be used to create related objects.

6.105.2 Member Function Documentation

6.105.2.1 ArcSec::EvaluatorContext::operator AlgFactory * () [inline]

Returns associated **AlgFactory** (p. 63) object

References ArcSec::Evaluator::getAlgFactory().

6.105.2.2 ArcSec::EvaluatorContext::operator AttributeFactory * () [inline]

Returns associated **AttributeFactory** (p. 72) object

References ArcSec::Evaluator::getAttrFactory().

6.105.2.3 ArcSec::EvaluatorContext::operator FnFactory * () [inline]

Returns associated **FnFactory** (p. 222) object

References ArcSec::Evaluator::getFnFactory().

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

- Evaluator.h

6.106 ArcSec::EvaluatorLoader Class Reference

EvaluatorLoader (p. 206) is implemented as a helper class for loading different **Evaluator** (p. 202) objects, like ArcEvaluator.

```
#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** &requestsource)
- **Request** * **getRequest** (const **Source** &requestsource)
- **Policy** * **getPolicy** (const std::string &classname, const **Source** &polycysource)
- **Policy** * **getPolicy** (const **Source** &polycysource)

6.106.1 Detailed Description

EvaluatorLoader (p. 206) is implemented as a helper class for loading different **Evaluator** (p. 202) objects, like ArcEvaluator. The object loading is based on the configuration information about evaluator, including information for factory class, request, policy and evaluator itself

6.106.2 Member Function Documentation

6.106.2.1 Evaluator* ArcSec::EvaluatorLoader::getEvaluator (const Request * request)

Get evaluator object suitable for presented request

6.106.2.2 Evaluator* ArcSec::EvaluatorLoader::getEvaluator (const Policy * policy)

Get evaluator object suitable for presented policy

6.106.2.3 Evaluator* ArcSec::EvaluatorLoader::getEvaluator (const std::string & classname)

Get evaluator object according to the class name

6.106.2.4 Policy* ArcSec::EvaluatorLoader::getPolicy (const Source & polycysource)

Get proper policy object according to the policy source

6.106.2.5 Policy* ArcSec::EvaluatorLoader::getPolicy (const std::string & classname, const Source & polycysource)

Get policy object according to the class name, based on the policy source

6.106.2.6 Request* ArcSec::EvaluatorLoader::getRequest (const Source & *requestsource*)

Get request object according to the request source

6.106.2.7 Request* ArcSec::EvaluatorLoader::getRequest (const std::string & *classname*, const Source & *requestsource*)

Get request object according to the class name, based on the request source

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

- EvaluatorLoader.h

6.107 Arc::ExecutableType Class Reference

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

- JobDescription.h

6.108 Arc::ExecutionTarget Class Reference

ExecutionTarget (p. 209).

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

Data Fields

- `int64_t MaxMainMemory`
- `int64_t MaxVirtualMemory`
- `int64_t MaxDiskSpace`
- `Software OperatingSystem`
- `std::list< ApplicationEnvironment > ApplicationEnvironments`

6.108.1 Detailed Description

ExecutionTarget (p. 209). 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).

6.108.2 Field Documentation

6.108.2.1 `std::list<ApplicationEnvironment> Arc::ExecutionTarget::ApplicationEnvironments`

`ApplicationEnvironments`. The `ApplicationEnvironments` member is a list of `ApplicationEnvironment`'s, defined in section 6.7 GLUE2.

6.108.2.2 `int64_t 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.

6.108.2.3 `int64_t 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.

6.108.2.4 `int64_t 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.

6.108.2.5 `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 system
- 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

6.109 Arc::ExpirationReminder Class Reference

A class intended for internal use within counters.

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

Public Member Functions

- **bool operator<** (const **ExpirationReminder** &other) const
- **Glib::TimeVal getExpiryTime** () const
- **Counter::IDType getReservationID** () const

Friends

- class **Counter**

6.109.1 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.

6.109.2 Member Function Documentation

6.109.2.1 Glib::TimeVal Arc::ExpirationReminder::getExpiryTime () const

Returns the expiry time. This method returns the expiry time of the reservation that this **ExpirationReminder** (p. 211) is associated with.

Returns:

The expiry time.

6.109.2.2 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** (p. 211) is associated with.

Returns:

The identification number.

6.109.2.3 bool Arc::ExpirationReminder::operator< (const ExpirationReminder & other) const

Less than operator, compares "soonest". This is the less than operator for the **ExpirationReminder** (p. 211) 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 always place the next reservation to expire at the top.

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

- Counter.h

6.110 Arc::FileCache Class Reference

```
#include <FileCache.h>
```

Public Member Functions

- **FileCache** (std::string cache_path, std::string id, uid_t job_uid, gid_t job_gid)
- **FileCache** (std::vector< std::string > caches, std::string id, uid_t job_uid, gid_t job_gid)
- **FileCache** (const **FileCache** &cache)
- **FileCache** ()
- virtual ~**FileCache** (void)
- bool **Start** (std::string url, bool &available, bool &is_locked)
- bool **Stop** (std::string url)
- bool **StopAndDelete** (std::string url)
- std::string **File** (std::string url)
- bool **Link** (std::string link_path, std::string url)
- bool **Copy** (std::string dest_path, std::string url, bool executable=false)
- bool **Clean** (unsigned long long int size=1)
- bool **Release** ()
- bool **AddDN** (std::string url, std::string DN, **Time** expiry_time)
- bool **CheckDN** (std::string url, std::string DN)
- bool **CheckCreated** (std::string url)
- **Time GetCreated** (std::string url)
- bool **CheckValid** (std::string url)
- **Time GetValid** (std::string url)
- bool **SetValid** (std::string url, **Time** val)
- **operator bool** ()
- bool **operator==** (const **FileCache** &a)

6.110.1 Detailed Description

FileCache (p. 212) provides an interface to all cache operations to be used by external classes. An instance should be created per job, and all files within the job are managed by that instance. When it is decided a file should be downloaded to the cache, **Start()** (p. 216) should be called, so that the cache file can be prepared and locked. When a transfer has finished successfully, **Link()** (p. 215) or **Copy()** (p. 214) should be called to create a hard link to a per-job directory in the cache and then soft link, or copy the file directly to the session directory so it can be accessed from the user's job. **Stop()** (p. 216) must then be called to release any locks on the cache file.

The cache directory(ies) and the optional directory to link to when the soft-links are made are set in the global configuration file. The names of cache files are formed from a hash of the **URL** (p. 435) specified as input to the job. To ease the load on the file system, the cache files are split into subdirectories based on the first two characters in the hash. For example the file with hash 76f11edda169848038efbd9fa3df5693 is stored in 76/f11edda169848038efbd9fa3df5693. A cache filename can be found by passing the **URL** (p. 435) to **Find()**. For more information on the structure of the cache, see the Grid Manager Administration Guide.

A metadata file with the '.meta' suffix is stored next to each cache file. This contains the **URL** (p. 435) corresponding to the cache file and the expiry time, if it is available. For example lfc://lfc1.ndgf.org//grid/atlas/test/test1 20081007151045Z

While cache files are downloaded, they are locked by creating a lock file with the '.lock' suffix next to the cache file. Calling **Start()** (p. 216) creates this lock and **Stop()** (p. 216) releases it. All processes calling **Start()** (p. 216) must wait until they successfully obtain the lock before downloading can begin.

6.110.2 Constructor & Destructor Documentation

6.110.2.1 Arc::FileCache::FileCache (std::string *cache_path*, std::string *id*, uid_t *job_uid*, gid_t *job_gid*)

Create a new **FileCache** (p. 212) instance.

Parameters:

cache_path The format is "cache_dir[link_path]". path is the path to the cache directory and the optional link_path is used to create a link in case the cache directory is visible under a different name during actual usage. When linking from the session dir this path is used instead of cache_path.

id the job id. This is used to create the per-job dir which the job's cache files will be hard linked from

job_uid owner of job. The per-job dir will only be readable by this user

job_gid owner group of job

6.110.2.2 Arc::FileCache::FileCache (std::vector< std::string > *caches*, std::string *id*, uid_t *job_uid*, gid_t *job_gid*)

Create a new **FileCache** (p. 212) instance with multiple cache dirs

Parameters:

caches a vector of strings describing caches. The format of each string is "cache_dir[link_path]".

id the job id. This is used to create the per-job dir which the job's cache files will be hard linked from

job_uid owner of job. The per-job dir will only be readable by this user

job_gid owner group of job

6.110.2.3 Arc::FileCache::FileCache (const FileCache & *cache*)

Copy constructor

6.110.2.4 Arc::FileCache::FileCache () [inline]

Default constructor. Invalid cache.

6.110.2.5 virtual Arc::FileCache::~FileCache (void) [virtual]

Destructor

6.110.3 Member Function Documentation

6.110.3.1 `bool Arc::FileCache::AddDN (std::string url, std::string DN, Time expiry_time)`

Add the given DN to the list of cached DNs with the given expiry time

Parameters:

url the url corresponding to the cache file to which we want to add a cached DN

DN the DN of the user

expiry_time the expiry time of this DN in the DN cache

6.110.3.2 `bool Arc::FileCache::CheckCreated (std::string url)`

Check if there is an information about creation time. Returns true if the file exists in the cache, since the creation time is the creation time of the cache file.

Parameters:

url the url corresponding to the cache file for which we want to know if the creation date exists

6.110.3.3 `bool Arc::FileCache::CheckDN (std::string url, std::string DN)`

Check if the given DN is cached for authorisation.

Parameters:

url the url corresponding to the cache file for which we want to check the cached DN

DN the DN of the user

6.110.3.4 `bool Arc::FileCache::CheckValid (std::string url)`

Check if there is an information about expiry time.

Parameters:

url the url corresponding to the cache file for which we want to know if the expiration time exists

6.110.3.5 `bool Arc::FileCache::Clean (unsigned long long int size = 1) [inline]`

Remove some amount of oldest information from cache. Returns true on success. Not implemented.

Parameters:

size amount to be removed (bytes)

6.110.3.6 `bool Arc::FileCache::Copy (std::string dest_path, std::string url, bool executable = false)`

Copy the cache file corresponding to url to the dest_path

6.110.3.7 `std::string Arc::FileCache::File (std::string url)`

Returns the full pathname of the file in the cache which corresponds to the given url.

6.110.3.8 `Time Arc::FileCache::GetCreated (std::string url)`

Get the creation time of a cached file. If the cache file does not exist, 0 is returned.

Parameters:

url the url corresponding to the cache file for which we want to know the creation date

6.110.3.9 `Time Arc::FileCache::GetValid (std::string url)`

Get expiry time of a cached file. If the time is not available, a time equivalent to 0 is returned.

Parameters:

url the url corresponding to the cache file for which we want to know the expiry time

6.110.3.10 `bool Arc::FileCache::Link (std::string link_path, std::string url)`

Create a hard-link to the per-job dir from the cache dir, and then a soft-link from here to the session directory. This is effectively 'claiming' the file for the job, so even if the original cache file is deleted, eg by some external process, the hard link still exists until it is explicitly released by calling **Release()** (p. 215).

If `cache_link_path` is set to "." then files will be copied directly to the session directory rather than via the hard link.

Parameters:

link_path path to the session dir for soft-link or new file

url url of file to link to or copy

6.110.3.11 `Arc::FileCache::operator bool (void) [inline]`

Returns true if object is useable.

6.110.3.12 `bool Arc::FileCache::operator==(const FileCache & a)`

Return true if all attributes are equal

6.110.3.13 `bool Arc::FileCache::Release ()`

Release claims on input files for the job specified by id. For each cache directory the per-job directory with the hard-links will be deleted.

6.110.3.14 `bool Arc::FileCache::SetValid (std::string url, Time val)`

Set expiry time.

Parameters:

url the url corresponding to the cache file for which we want to set the expiry time
val expiry time

6.110.3.15 `bool Arc::FileCache::Start (std::string url, bool & available, bool & is_locked)`

Prepare cache for downloading file, and lock the cached file. On success returns true. If there is another process downloading the same url, false is returned and `is_locked` is set to true. In this case the client should wait and retry later. If the lock has expired this process will take over the lock and the method will return as if no lock was present, ie `available` and `is_locked` are false.

Parameters:

url url that is being downloaded
available true on exit if the file is already in cache
is_locked true on exit if the file is already locked, ie cannot be used by this process

6.110.3.16 `bool Arc::FileCache::Stop (std::string url)`

This method (or `stopAndDelete`) must be called after file was downloaded or download failed, to release the lock on the cache file. `Stop()` (p. 216) does not delete the cache file. It returns false if the lock file does not exist, or another pid was found inside the lock file (this means another process took over the lock so this process must go back to `Start()` (p. 216)), or if it fails to delete the lock file.

Parameters:

url the url of the file that was downloaded

6.110.3.17 `bool Arc::FileCache::StopAndDelete (std::string url)`

Release the cache file and delete it, because for example a failed download left an incomplete copy, or it has expired. This method also deletes the meta file which contains the url corresponding to the cache file. The logic of the return value is the same as `Stop()` (p. 216).

Parameters:

url the url corresponding to the cache file that has to be released and deleted

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

- FileCache.h

6.111 FileCacheHash Class Reference

```
#include <FileCacheHash.h>
```

Static Public Member Functions

- static std::string **getHash** (std::string url)
- static int **maxLength** ()

6.111.1 Detailed Description

FileCacheHash (p. 217) provides methods to make hashes from strings. Currently the md5 hash from the openssl library is used.

6.111.2 Member Function Documentation

6.111.2.1 static std::string FileCacheHash::getHash (std::string *url*) [static]

Return a hash of the given URL, according to the current hash scheme.

6.111.2.2 static int FileCacheHash::maxLength () [inline, static]

Return the maximum length of a hash string.

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

- FileCacheHash.h

6.112 Arc::FileInfo Class Reference

FileInfo (p. 218) stores information about files (metadata).

```
#include <FileInfo.h>
```

6.112.1 Detailed Description

FileInfo (p. 218) stores information about files (metadata).

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

- FileInfo.h

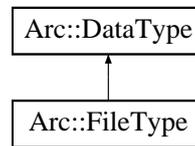
6.113 Arc::FileLock Class Reference

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

- FileLock.h

6.114 Arc::FileType Class Reference

Inheritance diagram for Arc::FileType::

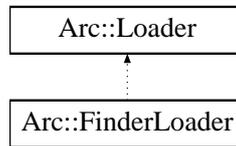


The documentation for this class was generated from the following file:

- JobDescription.h

6.115 Arc::FinderLoader Class Reference

Inheritance diagram for Arc::FinderLoader::



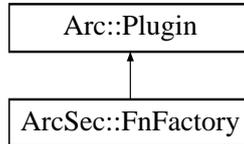
The documentation for this class was generated from the following file:

- FinderLoader.h

6.116 ArcSec::FnFactory Class Reference

Interface for function factory class.

#include <FnFactory.h> Inheritance diagram for ArcSec::FnFactory::



Public Member Functions

- virtual **Function** * **createFn** (const std::string &type)=0

6.116.1 Detailed Description

Interface for function factory class. **FnFactory** (p. 222) is in charge of creating **Function** (p. 223) 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** (p. 223) objects.

6.116.2 Member Function Documentation

6.116.2.1 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** (p. 223)

Returns:

The object of **Function** (p. 223)

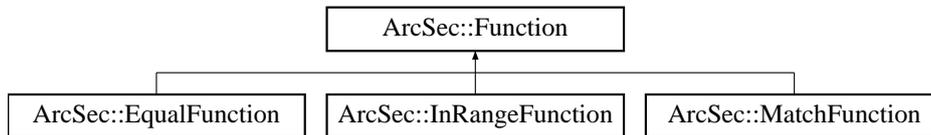
The documentation for this class was generated from the following file:

- FnFactory.h

6.117 ArcSec::Function Class Reference

Interface for function, which is in charge of evaluating two **AttributeValue** (p. 77).

#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

6.117.1 Detailed Description

Interface for function, which is in charge of evaluating two **AttributeValue** (p. 77).

6.117.2 Member Function Documentation

6.117.2.1 virtual std::list<AttributeValue*> ArcSec::Function::evaluate (std::list<AttributeValue * > args, bool check_id = true) [pure virtual]

Evaluate a list of **AttributeValue** (p. 77) objects, and return a list of Attribute objects

Implemented in **ArcSec::EqualFunction** (p. 198), **ArcSec::InRangeFunction** (p. 243), and **ArcSec::MatchFunction** (p. 272).

6.117.2.2 virtual AttributeValue* ArcSec::Function::evaluate (AttributeValue * arg0, AttributeValue * arg1, bool check_id = true) [pure virtual]

Evaluate two **AttributeValue** (p. 77) objects, and return one **AttributeValue** (p. 77) object

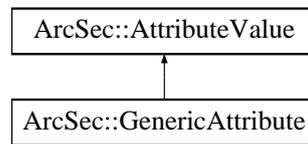
Implemented in **ArcSec::EqualFunction** (p. 198), **ArcSec::InRangeFunction** (p. 243), and **ArcSec::MatchFunction** (p. 272).

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

- Function.h

6.118 ArcSec::GenericAttribute Class Reference

Inheritance diagram for ArcSec::GenericAttribute::



Public Member Functions

- virtual std::string **encode** ()
- virtual std::string **getType** ()
- virtual std::string **getId** ()

6.118.1 Member Function Documentation

6.118.1.1 virtual std::string ArcSec::GenericAttribute::encode () [inline, virtual]

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 78).

6.118.1.2 virtual std::string ArcSec::GenericAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

6.118.1.3 virtual std::string ArcSec::GenericAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

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

- GenericAttribute.h

6.119 Arc::GlobusResult Class Reference

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

- GlobusErrorUtils.h

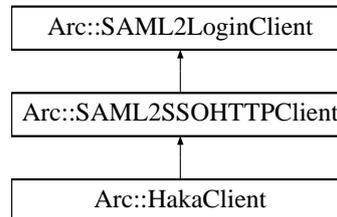
6.120 Arc::GSSCredential Class Reference

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

- GSSCredential.h

6.121 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** ()

6.121.1 Member Function Documentation

6.121.1.1 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** (p. 389).

6.121.1.2 MCC_Status Arc::HakaClient::processIdP2Confusa () [protected, virtual]

Redirects the user back from identity provider to the Confusa SP

Implements **Arc::SAML2SSOHTTPClient** (p. 390).

6.121.1.3 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 provisioned way

Implements **Arc::SAML2SSOHTTPClient** (p. 390).

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

- HakaClient.h

6.122 Arc::HTTPClientInfo Struct Reference

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

- ClientInterface.h

6.123 Arc::InfoCache Class Reference

Stores XML document in filesystem split into parts.

```
#include <InfoCache.h>
```

Public Member Functions

- **InfoCache** (const **Config** &cfg, const std::string &service_id)

6.123.1 Detailed Description

Stores XML document in filesystem split into parts.

6.123.2 Constructor & Destructor Documentation

6.123.2.1 Arc::InfoCache::InfoCache (const Config &cfg, const std::string &service_id)

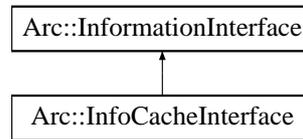
Creates object according to configuration (see InfoCacheConfig.xsd). XML configuration is passed in cfg. Argument service_id is used to distinguish between various documents stored under same path - corresponding files will be stored in subdirectory with service_id name.

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

- InfoCache.h

6.124 Arc::InfoCacheInterface Class Reference

Inheritance diagram for Arc::InfoCacheInterface::



Protected Member Functions

- virtual void **Get** (const std::list< std::string > &path, XMLNodeContainer &result)

6.124.1 Member Function Documentation

6.124.1.1 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** (p. 238).

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

- InfoCache.h

6.125 Arc::InfoFilter Class Reference

Filters information document according to identity of requestor.

```
#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

6.125.1 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.

6.125.2 Constructor & Destructor Documentation

6.125.2.1 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.

6.125.3 Member Function Documentation

6.125.3.1 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.

6.125.3.2 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.

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

- InfoFilter.h

6.126 Arc::InfoRegister Class Reference

Registration to ISIS interface.

```
#include <InfoRegister.h>
```

6.126.1 Detailed Description

Registration to ISIS interface. This class represents service registering to Information Indexing **Service** (p. 404). 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

6.127 Arc::InfoRegisterContainer Class Reference

```
#include <InfoRegister.h>
```

Public Member Functions

- void **addRegistrars** (XMLNode doc)
- void **addService** (InfoRegister *reg, const std::list< std::string > &ids, XMLNode cfg=XMLNode())
- void **removeService** (InfoRegister *reg)

6.127.1 Detailed Description

Singleton class for scanning configuration and storing refernces to registration elements.

6.127.2 Member Function Documentation

6.127.2.1 void Arc::InfoRegisterContainer::addRegistrars (XMLNode doc)

Adds ISISes to list of handled services. Supplied configuration document is scanned for **InfoRegistrar** (p. 235) elements and those are turned into **InfoRegistrar** (p. 235) classes for handling connection to ISIS service each.

6.127.2.2 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.

6.127.2.3 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

6.128 Arc::InfoRegisters Class Reference

Handling multiple registrations to ISISes.

```
#include <InfoRegister.h>
```

Public Member Functions

- **InfoRegisters** (XMLNode &cfg, Service *service_)

6.128.1 Detailed Description

Handling multiple registrations to ISISes.

6.128.2 Constructor & Destructor Documentation

6.128.2.1 Arc::InfoRegisters::InfoRegisters (XMLNode & cfg, Service * service_)

Constructor creates **InfoRegister** (p. 232) objects according to configuration. Inside cfg elements InfoRegistration are found and for each corresponding **InfoRegister** (p. 232) 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

6.129 Arc::InfoRegistrar Class Reference

Registration process associated with particular ISIS.

```
#include <InfoRegister.h>
```

Public Member Functions

- void **registration** (void)
- bool **addService** (InfoRegister *, XmlNode &)
- bool **removeService** (InfoRegister *)

6.129.1 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** (p. 235).

6.129.2 Member Function Documentation

6.129.2.1 bool Arc::InfoRegistrar::addService (InfoRegister *, XmlNode &)

Adds new service to list of handled services. **Service** (p. 404) is described by it's **InfoRegister** (p. 232) object which must be valid as long as this object is functional.

6.129.2.2 void Arc::InfoRegistrar::registration (void)

Performs registration in a loop. Never exits unless there is a critical error or requested by destructor.

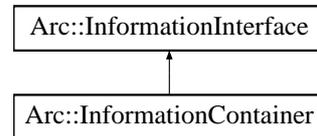
The documentation for this class was generated from the following file:

- InfoRegister.h

6.130 Arc::InformationContainer Class Reference

Information System document container and processor.

#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_**

6.130.1 Detailed Description

Information System document container and processor. This class inherits form **InformationInterface** (p. 238) and offers container for storing informational XML document.

6.130.2 Constructor & Destructor Documentation

6.130.2.1 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.

6.130.3 Member Function Documentation

6.130.3.1 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()

6.130.3.2 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.

6.130.3.3 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** (p. 238).

6.130.4 Field Documentation**6.130.4.1 XMLNode Arc::InformationContainer::doc_ [protected]**

Either link or container of XML document

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

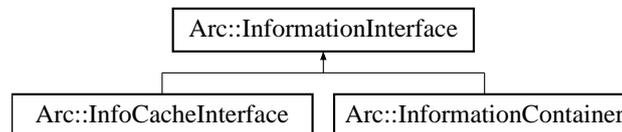
- InformationInterface.h

6.131 Arc::InformationInterface Class Reference

Information System message processor.

```
#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_**

6.131.1 Detailed Description

Information System message processor. This class provides callback for 2 operations of WS-ResourceProperties and convenient parsing/generation of corresponding SOAP messages. In a future it may extend range of supported specifications.

6.131.2 Constructor & Destructor Documentation

6.131.2.1 Arc::InformationInterface::InformationInterface (bool safe = true)

Constructor. If 'safe' is true all calls to Get will be locked.

6.131.3 Member Function Documentation

6.131.3.1 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::InfoCacheInterface** (p. 230), and **Arc::InformationContainer** (p. 237).

6.131.4 Field Documentation

6.131.4.1 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

6.132 Arc::InformationRequest Class Reference

Request for information in InfoSystem.

```
#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)

6.132.1 Detailed Description

Request for information in InfoSystem. This is a convenience wrapper creating proper WS-ResourceProperties request targeted InfoSystem interface of service.

6.132.2 Constructor & Destructor Documentation

6.132.2.1 Arc::InformationRequest::InformationRequest (void)

Dummy constructor

6.132.2.2 Arc::InformationRequest::InformationRequest (const std::list< std::string > & path)

Request for attribute specified by elements of path. Currently only first element is used.

6.132.2.3 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.

6.132.2.4 Arc::InformationRequest::InformationRequest (XMLNode query)

Request for attributes specified by XPath query.

6.132.3 Member Function Documentation

6.132.3.1 SOAPEnvelope* Arc::InformationRequest::SOAP (void)

Returns generated SOAP message

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

- InformationInterface.h

6.133 Arc::InformationResponse Class Reference

Informational response from InfoSystem.

```
#include <InformationInterface.h>
```

Public Member Functions

- **InformationResponse** (SOAPEnvelope &soap)
- `std::list< XMLNode > Result` (void)

6.133.1 Detailed Description

Informational response from InfoSystem. This is a convenience wrapper analyzing WS-ResourceProperties response from InfoSystem interface of service.

6.133.2 Constructor & Destructor Documentation

6.133.2.1 Arc::InformationResponse::InformationResponse (SOAPEnvelope & soap)

Constructor parses WS-ResourceProperties response. Provided SOAPEnvelope object must be valid as long as this object is in use.

6.133.3 Member Function Documentation

6.133.3.1 `std::list<XMLNode> Arc::InformationResponse::Result (void)`

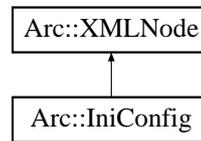
Returns set of attributes which were in SOAP message passed to constructor.

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

- InformationInterface.h

6.134 Arc::IniConfig Class Reference

Inheritance diagram for Arc::IniConfig::

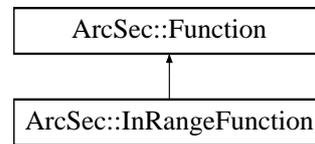


The documentation for this class was generated from the following file:

- IniConfig.h

6.135 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)`

6.135.1 Member Function Documentation

6.135.1.1 virtual `std::list<AttributeValue*> ArcSec::InRangeFunction::evaluate (std::list< AttributeValue * > args, bool check_id = true) [virtual]`

Evaluate a list of `AttributeValue` (p. 77) objects, and return a list of `Attribute` objects

Implements `ArcSec::Function` (p. 223).

6.135.1.2 virtual `AttributeValue* ArcSec::InRangeFunction::evaluate (AttributeValue * arg0, AttributeValue * arg1, bool check_id = true) [virtual]`

Evaluate two `AttributeValue` (p. 77) objects, and return one `AttributeValue` (p. 77) object

Implements `ArcSec::Function` (p. 223).

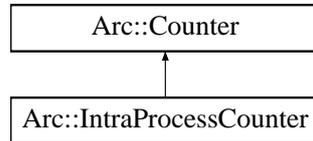
The documentation for this class was generated from the following file:

- `InRangeFunction.h`

6.136 Arc::IntraProcessCounter Class Reference

A class for counters used by threads within a single process.

#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**)

6.136.1 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** (p. 119) class for further information about counters and examples of usage.

6.136.2 Constructor & Destructor Documentation

6.136.2.1 Arc::IntraProcessCounter::IntraProcessCounter (int *limit*, int *excess*)

Creates an **IntraProcessCounter** (p.244) 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.

6.136.2.2 virtual Arc::IntraProcessCounter::~~IntraProcessCounter () [virtual]

Destructor. This is the destructor of the **IntraProcessCounter** (p. 244) class. Does not need to do anything.

6.136.3 Member Function Documentation**6.136.3.1 virtual void Arc::IntraProcessCounter::cancel (IDType *reservationID*) [protected, virtual]**

Cancellation of a reservation. This method cancels a reservation. It is called by the **CounterTicket** (p. 126) that corresponds to the reservation.

Parameters:

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

Implements **Arc::Counter** (p. 121).

6.136.3.2 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** (p. 121).

6.136.3.3 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** (p. 122).

6.136.3.4 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** (p. 126) 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** (p. 122).

6.136.3.5 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** (p. 123).

6.136.3.6 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** (p. 123).

6.136.3.7 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** (p. 124).

6.136.3.8 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** (p. 126) that can be queried about the status of the reservation as well as for cancellations and extensions.

Implements **Arc::Counter** (p. 124).

6.136.3.9 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** (p. 124).

6.136.3.10 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** (p. 125).

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

- IntraProcessCounter.h

6.137 Arc::ISIS_description Struct Reference

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

- InfoRegister.h

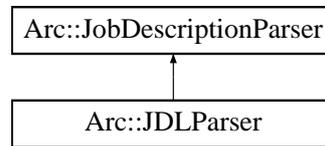
6.138 Arc::IString Class Reference

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

- IString.h

6.139 Arc::JDLParser Class Reference

Inheritance diagram for Arc::JDLParser::



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

- JDLParser.h

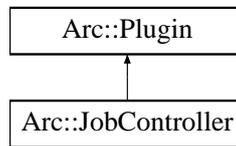
6.140 Arc::Job Class Reference

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

- Job.h

6.141 Arc::JobController Class Reference

#include <JobController.h>Inheritance diagram for Arc::JobController::



6.141.1 Detailed Description

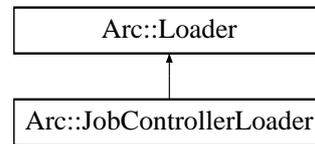
Base class for the JobControllers Must be specialiced for each supported middleware flavour.

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

- JobController.h

6.142 Arc::JobControllerLoader Class Reference

#include <JobController.h> Inheritance diagram for Arc::JobControllerLoader::



Public Member Functions

- **JobControllerLoader** ()
- **~JobControllerLoader** ()
- **JobController * load** (const std::string &name, const **Config** &cfg, const **UserConfig** &usercfg)
- const std::list< **JobController** * > & **GetJobControllers** () const

6.142.1 Detailed Description

Class responsible for loading **JobController** (p. 252) plugins The **JobController** (p. 252) objects returned by a **JobControllerLoader** (p. 253) must not be used after the **JobControllerLoader** (p. 253) goes out of scope.

6.142.2 Constructor & Destructor Documentation

6.142.2.1 Arc::JobControllerLoader::JobControllerLoader ()

Constructor Creates a new **JobControllerLoader** (p. 253).

6.142.2.2 Arc::JobControllerLoader::~~JobControllerLoader ()

Destructor Calling the destructor destroys all JobControllers loaded by the **JobControllerLoader** (p. 253) instance.

6.142.3 Member Function Documentation

6.142.3.1 const std::list<JobController*>& Arc::JobControllerLoader::GetJobControllers () const [inline]

Retrieve the list of loaded JobControllers.

Returns:

A reference to the list of JobControllers.

6.142.3.2 **JobController*** **Arc::JobControllerLoader::load** (const std::string & *name*, const Config & *cfg*, const UserConfig & *usercfg*)

Load a new **JobController** (p. 252)

Parameters:

name The name of the **JobController** (p. 252) to load.

cfg The **Config** (p. 113) object for the new **JobController** (p. 252).

usercfg The **UserConfig** (p. 447) object for the new **JobController** (p. 252).

Returns:

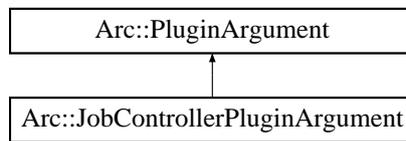
A pointer to the new **JobController** (p. 252) (NULL on error).

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

- JobController.h

6.143 Arc::JobControllerPluginArgument Class Reference

Inheritance diagram for Arc::JobControllerPluginArgument::



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

- JobController.h

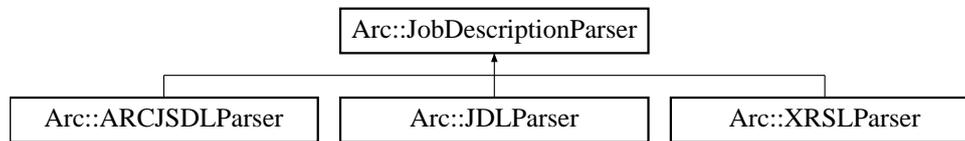
6.144 Arc::JobDescription Class Reference

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

- JobDescription.h

6.145 Arc::JobDescriptionParser Class Reference

Inheritance diagram for Arc::JobDescriptionParser::



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

- JobDescriptionParser.h

6.146 Arc::JobIdentificationType Class Reference

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

- JobDescription.h

6.147 Arc::JobMetaType Class Reference

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

- JobDescription.h

6.148 Arc::JobState Class Reference

```
#include <JobState.h>
```

6.148.1 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** (p.260):StateType. An example of a constructor in a plugin could be: JobStatePlugin::JobStatePlugging(const std::string& state) : JobState(state, &pluginStateMap) {} where &pluginStateMap is a reference to the JobStateMap defined by the derived class.

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

- JobState.h

6.149 Arc::JobSupervisor Class Reference

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

- JobSupervisor.h

6.150 Arc::LoadableModuleDescription Class Reference

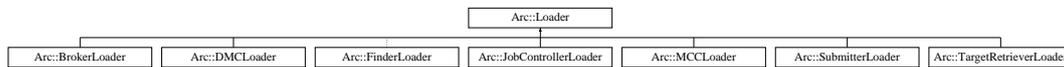
The documentation for this class was generated from the following file:

- ModuleManager.h

6.151 Arc::Loader Class Reference

Plugins loader.

#include <Loader.h> Inheritance diagram for Arc::Loader::



Public Member Functions

- **Loader** (const Config &cfg)
- **~Loader** ()

Protected Attributes

- **PluginsFactory * factory_**

6.151.1 Detailed Description

Plugins loader. This class processes XML configuration 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.

6.151.2 Constructor & Destructor Documentation

6.151.2.1 Arc::Loader::Loader (const Config & cfg)

Constructor that takes whole XML configuration and performs common configuration part

6.151.2.2 Arc::Loader::~~Loader ()

Destructor destroys all components created by constructor

6.151.3 Field Documentation

6.151.3.1 PluginsFactory* Arc::Loader::factory_ [protected]

Link to Factory responsible for loading and creation of **Plugin** (p. 339) and derived objects

Referenced by Arc::ChainContext::operator PluginsFactory *().

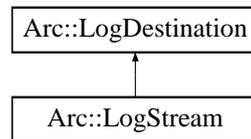
The documentation for this class was generated from the following file:

- Loader.h

6.152 Arc::LogDestination Class Reference

A base class for log destinations.

#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)

6.152.1 Detailed Description

A base class for log destinations. This class defines an interface for LogDestinations. **LogDestination** (p. 264) objects will typically contain synchronization mechanisms and should therefore never be copied.

6.152.2 Constructor & Destructor Documentation

6.152.2.1 Arc::LogDestination::LogDestination () [protected]

Default constructor. This destination will use the default locale.

6.152.2.2 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

6.153 Arc::Logger Class Reference

A logger class.

```
#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 **removeDestinations** (void)
- void **setThreshold** (**LogLevel** threshold)
- **LogLevel** **getThreshold** () const
- void **msg** (**LogMessage** message)
- void **msg** (**LogLevel** level, const std::string &str)

Static Public Member Functions

- static **Logger** & **getRootLogger** ()

6.153.1 Detailed Description

A logger class. This class defines a **Logger** (p. 265) to which LogMessages can be sent.

Every **Logger** (p. 265) (except for the rootLogger) has a parent **Logger** (p. 265). The domain of a **Logger** (p. 265) (a string that indicates the origin of LogMessages) is composed by adding a subdomain to the domain of its parent **Logger** (p. 265).

A **Logger** (p. 265) also has a threshold. Every **LogMessage** (p. 268) that have a level that is greater than or equal to the threshold is forwarded to any **LogDestination** (p. 264) connected to this **Logger** (p. 265) as well as to the parent **Logger** (p. 265).

Typical usage of the **Logger** (p. 265) class is to declare a global **Logger** (p. 265) object for each library/module/component to be used by all classes and methods there.

6.153.2 Constructor & Destructor Documentation

6.153.2.1 Arc::Logger::Logger (Logger &parent, const std::string &subdomain)

Creates a logger. Creates a logger. The threshold is inherited from its parent **Logger** (p. 265).

Parameters:

parent The parent **Logger** (p. 265) of the new **Logger** (p. 265).

subdomain The subdomain of the new logger.

6.153.2.2 `Arc::Logger::Logger (Logger & parent, const std::string & subdomain, LogLevel threshold)`

Creates a logger. Creates a logger.

Parameters:

- parent* The parent **Logger** (p. 265) of the new **Logger** (p. 265).
- subdomain* The subdomain of the new logger.
- threshold* The threshold of the new logger.

6.153.2.3 `Arc::Logger::~~Logger ()`

Destroys a logger. Destructor

6.153.3 Member Function Documentation

6.153.3.1 `void Arc::Logger::addDestination (LogDestination & destination)`

Adds a **LogDestination** (p. 264). Adds a **LogDestination** (p. 264) to which to forward LogMessages sent to this logger (if they pass the threshold). Since LogDestinatoin should not be copied, the new **LogDestination** (p. 264) is passed by reference and a pointer to it is kept for later use. It is therefore important that the **LogDestination** (p. 264) passed to this **Logger** (p. 265) exists at least as long as the **Logger** (p. 265) itself.

6.153.3.2 `static Logger& Arc::Logger::getRootLogger () [static]`

The root **Logger** (p. 265). This is the root **Logger** (p. 265). It is an ancestor of any other **Logger** (p. 265) and always exists.

6.153.3.3 `LogLevel Arc::Logger::getThreshold () const`

Returns the threshold. Returns the threshold.

Returns:

- The threshold of this **Logger** (p. 265).

6.153.3.4 `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** (p. 268) and sends it to the other **msg()** (p. 267) method.

Parameters:

- level* The level of the message.
- str* The message text.

References **msg()**.

6.153.3.5 void Arc::Logger::msg (LogMessage *message*)

Sends a **LogMessage** (p. 268). Sends a **LogMessage** (p. 268).

Parameters:

The **LogMessage** (p. 268) to send.

Referenced by msg(), and Arc::stringto().

6.153.3.6 void Arc::Logger::setThreshold (LogLevel *threshold*)

Sets the threshold. This method sets the threshold of the **Logger** (p. 265). Any message sent to this **Logger** (p. 265) that has a level below this threshold will be discarded.

Parameters:

The threshold

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

- Logger.h

6.154 Arc::LogMessage Class Reference

A class for log messages.

```
#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)

6.154.1 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.

6.154.2 Constructor & Destructor Documentation

6.154.2.1 Arc::LogMessage::LogMessage (LogLevel level, const IString & message)

Creates a **LogMessage** (p. 268) with the specified level and message text. This constructor creates a **LogMessage** (p. 268) with the specified level and message text. The time is set automatically, the domain is set by the **Logger** (p. 265) to which the **LogMessage** (p. 268) 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** (p. 268).

message The message text.

6.154.2.2 Arc::LogMessage::LogMessage (LogLevel level, const IString & message, const std::string & identifier)

Creates a **LogMessage** (p. 268) with the specified attributes. This constructor creates a **LogMessage** (p. 268) with the specified level, message text and identifier. The time is set automatically and the domain is set by the **Logger** (p. 265) to which the **LogMessage** (p. 268) is sent.

Parameters:

level The level of the **LogMessage** (p. 268).

message The message text.

ident The identifier of the **LogMessage** (p. 268).

6.154.3 Member Function Documentation

6.154.3.1 LogLevel Arc::LogMessage::getLevel () const

Returns the level of the **LogMessage** (p. 268). Returns the level of the **LogMessage** (p. 268).

Returns:

The level of the **LogMessage** (p. 268).

6.154.3.2 void Arc::LogMessage::setIdentifier (std::string *identifier*) [protected]

Sets the identifier of the **LogMessage** (p. 268). The purpose of this method is to allow subclasses (in case there are any) to set the identifier of a **LogMessage** (p. 268).

Parameters:

The identifier.

6.154.4 Friends And Related Function Documentation

6.154.4.1 friend class Logger [friend]

The **Logger** (p. 265) class is a friend. The **Logger** (p. 265) class must have some privileges (e.g. ability to call the setDomain() method), therefore it is a friend.

6.154.4.2 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.

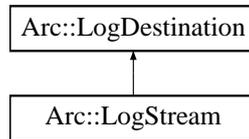
The documentation for this class was generated from the following file:

- Logger.h

6.155 Arc::LogStream Class Reference

A class for logging to ostreams.

#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)

6.155.1 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** (p. 270) object as long as the **Logger** (p. 265) to which it has been registered.

6.155.2 Constructor & Destructor Documentation

6.155.2.1 Arc::LogStream::LogStream (std::ostream & destination)

Creates a **LogStream** (p. 270) connected to an ostream. Creates a **LogStream** (p. 270) connected to the specified ostream. In order not to break synchronization, it is important not to connect more than one **LogStream** (p. 270) object to a certain stream.

Parameters:

destination The ostream to which to erite LogMessages.

6.155.2.2 Arc::LogStream::LogStream (std::ostream & destination, const std::string & locale)

Creates a **LogStream** (p. 270) connected to an ostream. Creates a **LogStream** (p. 270) connected to the specified ostream. The output will be localised to the specified locale.

6.155.3 Member Function Documentation

6.155.3.1 virtual void Arc::LogStream::log (const LogMessage & message) [virtual]

Writes a **LogMessage** (p. 268) to the stream. This method writes a **LogMessage** (p. 268) to the ostream that is connected to this **LogStream** (p. 270) object. It is synchronized so that not more than one **LogMessage** (p. 268) can be written at a time.

Parameters:

message The **LogMessage** (p. 268) to write.

Implements **Arc::LogDestination** (p. 264).

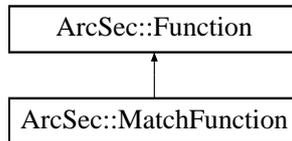
The documentation for this class was generated from the following file:

- `Logger.h`

6.156 ArcSec::MatchFunction Class Reference

Evaluate whether arg1 (value in regular expression) matched arg0 (lable in regular expression).

#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)`

6.156.1 Detailed Description

Evaluate whether arg1 (value in regular expression) matched arg0 (lable in regular expression).

6.156.2 Member Function Documentation

6.156.2.1 `virtual std::list<AttributeValue*> ArcSec::MatchFunction::evaluate (std::list< AttributeValue * > args, bool check_id = true) [virtual]`

Evaluate a list of `AttributeValue` (p. 77) objects, and return a list of Attribute objects

Implements `ArcSec::Function` (p. 223).

6.156.2.2 `virtual AttributeValue* ArcSec::MatchFunction::evaluate (AttributeValue * arg0, AttributeValue * arg1, bool check_id = true) [virtual]`

Evaluate two `AttributeValue` (p. 77) objects, and return one `AttributeValue` (p. 77) object

Implements `ArcSec::Function` (p. 223).

6.156.2.3 `static std::string ArcSec::MatchFunction::getFunctionName (std::string datatype) [static]`

help function to get the FunctionName

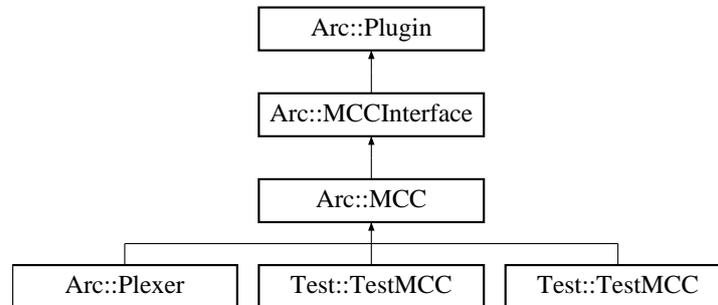
The documentation for this class was generated from the following file:

- MatchFunction.h

6.157 Arc::MCC Class Reference

Message (p. 286) Chain Component - base class for every **MCC** (p. 274) plugin.

#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="")

Protected Attributes

- std::map< std::string, **MCCInterface** * > **next_**
- std::map< std::string, std::list< **ArcSec::SecHandler** * > > **sechandlers_**

Static Protected Attributes

- static **Logger** logger

6.157.1 Detailed Description

Message (p. 286) Chain Component - base class for every **MCC** (p. 274) plugin. This is partially virtual class which defines interface and common functionality for every **MCC** (p. 274) plugin needed for managing of component in a chain.

6.157.2 Constructor & Destructor Documentation

6.157.2.1 Arc::MCC::MCC (Config *) [inline]

Example constructor - **MCC** (p. 274) takes at least it's configuration subtree

6.157.3 Member Function Documentation

6.157.3.1 virtual void Arc::MCC::AddSecHandler (Config * cfg, ArcSec::SecHandler * sechandler, const std::string & label = "") [virtual]

Add security components/handlers to this **MCC** (p. 274). 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** (p. 274) 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** (p. 274) 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.

6.157.3.2 virtual void Arc::MCC::Next (MCCInterface * next, const std::string & label = "") [virtual]

Add reference to next **MCC** (p. 274) in chain. This method is called by **Loader** (p. 263) for every potentially labeled link to next component which implements **MCCInterface** (p. 280). If next is NULL corresponding link is removed.

Reimplemented in **Arc::Plexer** (p. 337).

6.157.3.3 virtual MCC_Status Arc::MCC::process (Message &, Message &) [inline, virtual]

Dummy **Message** (p. 286) processing method. Just a placeholder.

Implements **Arc::MCCInterface** (p. 280).

Reimplemented in **Arc::Plexer** (p. 337).

6.157.3.4 bool Arc::MCC::ProcessSecHandlers (Message & message, const std::string & label = "") [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 implementation of the **MCC** (p. 274).

6.157.3.5 virtual void Arc::MCC::Unlink () [virtual]

Removing all links. Useful for destroying chains.

6.157.4 Field Documentation

6.157.4.1 `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` (p. 337).

6.157.4.2 `std::map<std::string, MCCInterface *> Arc::MCC::next_` [`protected`]

Set of labeled "next" components. Each implemented `MCC` (p. 274) must call `process()` (p. 275) method of corresponding `MCCInterface` (p. 280) from this set in own `process()` (p. 275) method.

6.157.4.3 `std::map<std::string, std::list<ArcSec::SecHandler *> > Arc::MCC::sechandlers_` [`protected`]

Set of labeled authentication and authorization handlers. `MCC` (p. 274) calls sequence of handlers at specific point depending on associated identifier. In most cases those are "in" and "out" for incoming and outgoing messages correspondingly.

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

- `MCC.h`

6.158 Arc::MCC_Status Class Reference

A class for communication of **MCC** (p. 274) processing results.

```
#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

6.158.1 Detailed Description

A class for communication of **MCC** (p. 274) processing results. This class is used to communicate result status between MCCs. It contains a status kind, a string specifying the origin (**MCC** (p. 274)) of the status object and an explanation.

6.158.2 Constructor & Destructor Documentation

6.158.2.1 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** (p. 277) object.

Parameters:

- kind* The StatusKind (default: STATUS_UNDEFINED)
- origin* The origin **MCC** (p. 274) (default: "??")
- explanation* An explanation (default: "No explanation.")

6.158.3 Member Function Documentation

6.158.3.1 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.

6.158.3.2 StatusKind Arc::MCC_Status::getKind () const

Returns the status kind. Returns the status kind of this object.

Returns:

The status kind of this object.

6.158.3.3 const std::string& Arc::MCC_Status::getOrigin () const

Returns the origin. This method returns a string specifying the origin **MCC** (p. 274) of this object.

Returns:

A string specifying the origin **MCC** (p. 274) of this object.

6.158.3.4 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!().

6.158.3.5 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().

6.158.3.6 Arc::MCC_Status::operator std::string () const

Conversion to string. This operator converts a **MCC_Status** (p. 277) object to a string.

6.158.3.7 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**

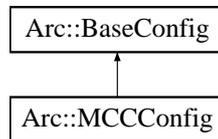
References isOk().

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

- MCC_Status.h

6.159 Arc::MCCConfig Class Reference

Inheritance diagram for Arc::MCCConfig::



Public Member Functions

- virtual XMLNode MakeConfig (XMLNode *cfg*) const

6.159.1 Member Function Documentation

6.159.1.1 virtual XMLNode Arc::MCCConfig::MakeConfig (XMLNode *cfg*) const [virtual]

Adds configuration part corresponding to stored information into common configuration tree supplied in 'cfg' argument.

Reimplemented from **Arc::BaseConfig** (p. 85).

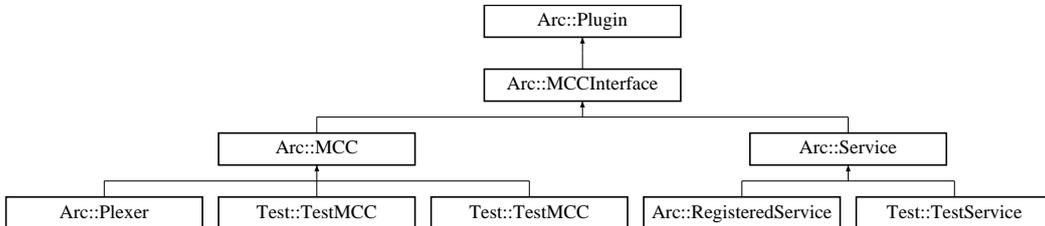
The documentation for this class was generated from the following file:

- MCC.h

6.160 Arc::MCCInterface Class Reference

Interface for communication between **MCC** (p. 274), **Service** (p. 404) and **Plexer** (p. 336) objects.

#include <MCC.h> Inheritance diagram for Arc::MCCInterface::



Public Member Functions

- virtual **MCC_Status** process (**Message** &request, **Message** &response)=0

6.160.1 Detailed Description

Interface for communication between **MCC** (p. 274), **Service** (p. 404) and **Plexer** (p. 336) objects. The Interface consists of the method **process()** (p. 280) which is called by the previous **MCC** (p. 274) in the chain. For memory management policies please read the description of the **Message** (p. 286) class.

6.160.2 Member Function Documentation

6.160.2.1 virtual **MCC_Status** Arc::MCCInterface::process (**Message** & *request*, **Message** & *response*) [**pure virtual**]

Method for processing of requests and responses. This method is called by preceding **MCC** (p. 274) in chain when a request needs to be processed. This method must call similar method of next **MCC** (p. 274) in chain unless any failure happens. Result returned by call to next **MCC** (p. 274) should be processed and passed back to previous **MCC** (p. 274). In case of failure this method is expected to generate valid error response and return it back to previous **MCC** (p. 274) without calling the next one.

Parameters:

request The request that needs to be processed.

response A **Message** (p. 286) object that will contain the response of the request when the method returns.

Returns:

An object representing the status of the call.

Implemented in **Test::TestService** (p. 429), **Arc::MCC** (p. 275), and **Arc::Plexer** (p. 337).

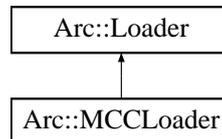
The documentation for this class was generated from the following file:

- MCC.h

6.161 Arc::MCCLoader Class Reference

Creator of **Message** (p. 286) Component Chains (**MCC** (p. 274)).

#include <MCCLoader.h> Inheritance diagram for Arc::MCCLoader::



Public Member Functions

- **MCCLoader** (**Config** &cfg)
- **~MCCLoader** ()
- **MCC * operator[]** (const std::string &id)

6.161.1 Detailed Description

Creator of **Message** (p. 286) Component Chains (**MCC** (p. 274)). This class processes XML configuration and creates message chains. Accepted configuration is defined by XML schema mcc.xsd. Supported components are of types **MCC** (p. 274), **Service** (p. 404) and **Plexer** (p. 336). **MCC** (p. 274) and **Service** (p. 404) are loaded from dynamic libraries. For **Plexer** (p. 336) 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** (p. 286) 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.

6.161.2 Constructor & Destructor Documentation

6.161.2.1 Arc::MCCLoader::MCCLoader (Config & cfg)

Constructor that takes whole XML configuration and creates component chains

6.161.2.2 Arc::MCCLoader::~~MCCLoader ()

Destructor destroys all components created by constructor

6.161.3 Member Function Documentation

6.161.3.1 MCC* Arc::MCCLoader::operator[] (const std::string & id)

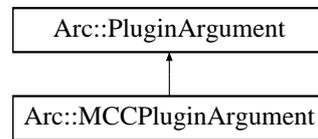
Access entry MCCs in chains. Those are components exposed for external access using 'entry' attribute

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

- MCCLoader.h

6.162 Arc::MCCPluginArgument Class Reference

Inheritance diagram for Arc::MCCPluginArgument::



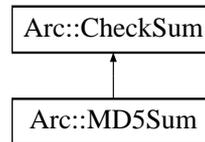
The documentation for this class was generated from the following file:

- MCC.h

6.163 Arc::MD5Sum Class Reference

Implementation of MD5 checksum.

#include <Checksum.h>Inheritance diagram for Arc::MD5Sum::



6.163.1 Detailed Description

Implementation of MD5 checksum.

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

- CheckSum.h

6.164 Arc::MemoryAllocationException Class Reference

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

- ByteArray.h

6.165 Arc::Message Class Reference

Object being passed through chain of MCCs.

```
#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)

6.165.1 Detailed Description

Object being passed through chain of MCCs. An instance of this class refers to objects with main content (**MessagePayload** (p. 296)), authentication/authorization information (**MessageAuth** (p. 292)) and common purpose attributes (**MessageAttributes** (p. 289)). **Message** (p. 286) class does not manage pointers to objects and their content. It only serves for grouping those objects. **Message** (p. 286) objects are supposed to be processed by MCCs and Services implementing **MCCInterface** (p. 280) method process(). All objects constituting content of **Message** (p. 286) object are subject to following policies:

1. All objects created inside call to process() method using new command must be explicitly destroyed within same call using delete command with following exceptions. a) Objects which are assigned to 'response' **Message** (p. 286). b) Objects whose management is completely acquired by objects assigned to 'response' **Message** (p. 286).
2. All objects not created inside call to process() method are not explicitly 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** (p. 286) object).
4. It is allowed to change content of pointers of 'request' **Message** (p. 286). Calling process() method must not rely on that object to stay intact.
5. Called process() method should either fill 'response' **Message** (p. 286) with pointers to valid objects or to keep them intact. This makes it possible for calling process() to preload 'response' with valid error message.

6.165.2 Constructor & Destructor Documentation

6.165.2.1 Arc::Message::Message (void) [inline]

true if `auth_ctx_` was created internally Dummy constructor

6.165.2.2 Arc::Message::Message (Message & *msg*) [inline]

Copy constructor. Ensures shallow copy.

6.165.2.3 Arc::Message::Message (long *msg_ptr_addr*)

Copy constructor. Used by language bindings

6.165.2.4 Arc::Message::~~Message (void) [inline]

Destructor does not affect referred objects except those created internally

6.165.3 Member Function Documentation

6.165.3.1 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=()`.

6.165.3.2 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=()`.

6.165.3.3 void Arc::Message::AuthContext (MessageAuthContext * *auth_ctx*) [inline]

Assigns `auth*` context object

6.165.3.4 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=()`.

6.165.3.5 void Arc::Message::Context (MessageContext * *ctx*) [inline]

Assigns message context object

6.165.3.6 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 (p. 274) in a chain is connectionless like one implementing UDP protocol.

Referenced by operator=().

6.165.3.7 Message& Arc::Message::operator= (Message & msg) [inline]

Assignment. Ensures shallow copy.

References Attributes(), Auth(), AuthContext(), and Context().

6.165.3.8 MessagePayload* Arc::Message::Payload (MessagePayload * payload) [inline]

Replaces payload with new one. Returns the old one.

6.165.3.9 MessagePayload* Arc::Message::Payload (void) [inline]

Returns pointer to current payload or NULL if no payload assigned.

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

- Message.h

6.166 Arc::MessageAttributes Class Reference

A class for storage of attribute values.

```
#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_**

6.166.1 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** (p.286) Chain Component (**MCC** (p.274)) 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** (p.274) 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** (p.274). 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** (p.274) and used by the plexer for routing the message to the appropriate service.

6.166.2 Constructor & Destructor Documentation

6.166.2.1 Arc::MessageAttributes::MessageAttributes ()

The default constructor. This is the default constructor of the **MessageAttributes** (p.289) class. It constructs an empty object that initially contains no attributes.

6.166.3 Member Function Documentation

6.166.3.1 `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.

6.166.3.2 `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.

6.166.3.3 `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.

6.166.3.4 `AttributeIterator Arc::MessageAttributes::getAll (const std::string & key) const`

Access the value(s) of an attribute. This method returns an **AttributeIterator** (p. 73) 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** (p. 73) for access of the values of the attribute.

6.166.3.5 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.

6.166.3.6 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.

6.166.3.7 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.

6.166.4 Field Documentation**6.166.4.1 AttrMap Arc::MessageAttributes::attributes_ [protected]**

Internal storage of attributes. An AttrMap (multimap) in which all attributes (key-value pairs) are stored.

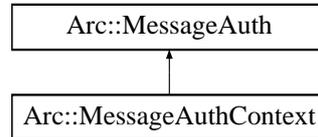
The documentation for this class was generated from the following file:

- MessageAttributes.h

6.167 Arc::MessageAuth Class Reference

Contains authenticity information, authorization tokens and decisions.

#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) const

6.167.1 Detailed Description

Contains authenticity information, authorization tokens and decisions. This class only supports string keys and **SecAttr** (p. 395) values.

6.167.2 Member Function Documentation

6.167.2.1 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()** (p. 292) tries to merge generated information to already existing like everything would be generated inside same **Export()** (p. 292) method. If does not represent valid node then new XML tree is created.

6.167.2.2 MessageAuth* Arc::MessageAuth::Filter (const std::list< std::string > *selected_keys*, const std::list< std::string > *rejected_keys*) const

Creates new instance of **MessageAuth** (p. 292) 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 referred attributes. Hence parent instance must not be deleted as long as this one is in use.

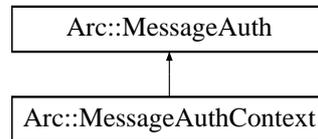
The documentation for this class was generated from the following file:

- MessageAuth.h

6.168 Arc::MessageAuthContext Class Reference

Handler for content of message auth* context.

#include <Message.h>Inheritance diagram for Arc::MessageAuthContext::



6.168.1 Detailed Description

Handler for content of message auth* context. This class is a container for authorization and authentication information. It gets associated with **Message** (p. 286) object usually by first **MCC** (p. 274) in a chain and is kept as long as connection persists.

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

- Message.h

6.169 Arc::MessageContext Class Reference

Handler for content of message context.

```
#include <Message.h>
```

Public Member Functions

- void **Add** (const std::string &name, **MessageContextElement** *element)

6.169.1 Detailed Description

Handler for content of message context. This class is a container for objects derived from **MessageContextElement** (p. 295). It gets associated with **Message** (p. 286) object usually by first **MCC** (p. 274) in a chain and is kept as long as connection persists.

6.169.2 Member Function Documentation

6.169.2.1 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.

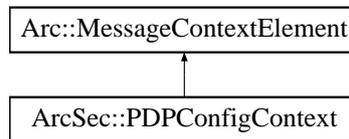
The documentation for this class was generated from the following file:

- Message.h

6.170 Arc::MessageContextElement Class Reference

Top class for elements contained in message context.

#include <Message.h> Inheritance diagram for Arc::MessageContextElement::



6.170.1 Detailed Description

Top class for elements contained in message context. Objects of classes inherited with this one may be stored in **MessageContext** (p. 294) container.

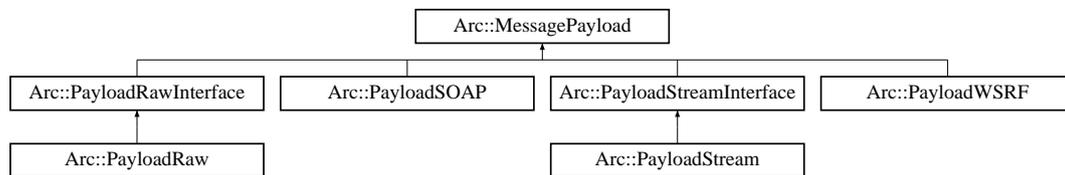
The documentation for this class was generated from the following file:

- Message.h

6.171 Arc::MessagePayload Class Reference

Base class for content of message passed through chain.

`#include <Message.h>`Inheritance diagram for Arc::MessagePayload::



6.171.1 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.

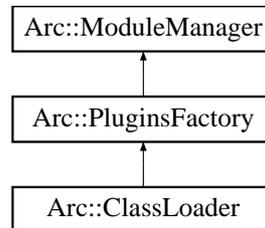
The documentation for this class was generated from the following file:

- Message.h

6.172 Arc::ModuleManager Class Reference

Manager of shared libraries.

#include <ModuleManager.h> Inheritance diagram for Arc::ModuleManager::



Public Member Functions

- **ModuleManager** (const **Config** *cfg)
- Glib::Module * **load** (const std::string &name, bool probe=false)
- 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** (**Config** *cfg)

6.172.1 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.

6.172.2 Constructor & Destructor Documentation

6.172.2.1 Arc::ModuleManager::ModuleManager (const Config * cfg)

Cache of handles of loaded modules Constructor. It is supposed to process corresponding configuration subtree and tune module loading parameters accordingly. Currently it only sets modlur directory to current one.

6.172.3 Member Function Documentation

6.172.3.1 std::string Arc::ModuleManager::findLocation (const std::string & name)

Finds shared library corresponding to module 'name' and returns path to it

6.172.3.2 `Glib::Module*` `Arc::ModuleManager::load (const std::string & name, bool probe = false)`

Finds module 'name' in cache or loads corresponding shared library

6.172.3.3 `bool` `Arc::ModuleManager::makePersistent (const std::string & name)`

Make sure this module is never unloaded. Even if `unload()` (p. 298) is called.

6.172.3.4 `bool` `Arc::ModuleManager::makePersistent (Glib::Module * module)`

Make sure this module is never unloaded. Even if `unload()` (p. 298) is called.

6.172.3.5 `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.

6.172.3.6 `void` `Arc::ModuleManager::setCfg (Config * cfg)`

Input the configuration subtree, and trigger the module loading (do almost the same as the Constructor); It is function designed for `ClassLoader` (p. 100) to adopt the singleton pattern

6.172.3.7 `void` `Arc::ModuleManager::unload (const std::string & name)`

Unload module by its name

6.172.3.8 `void` `Arc::ModuleManager::unload (Glib::Module * module)`

Unload module by its identifier

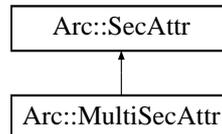
The documentation for this class was generated from the following file:

- `ModuleManager.h`

6.173 Arc::MultiSecAttr Class Reference

Container of multiple **SecAttr** (p. 395) attributes.

#include <SecAttr.h> Inheritance diagram for Arc::MultiSecAttr::



Public Member Functions

- virtual **operator bool** () const
- virtual bool **Export** (**SecAttrFormat** format, **XMLNode** &val) const

6.173.1 Detailed Description

Container of multiple **SecAttr** (p. 395) 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.

6.173.2 Member Function Documentation

6.173.2.1 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** (p. 395).

6.173.2.2 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.

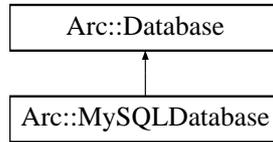
Reimplemented from **Arc::SecAttr** (p. 396).

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

- SecAttr.h

6.174 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** ()

6.174.1 Detailed Description

Implement the database accessing interface in **DBInterface.h** (p. ??) by using mysql client library for accessing mysql database

6.174.2 Member Function Documentation

6.174.2.1 virtual void Arc::MySQLDatabase::close () [virtual]

Close the connection with database server

Implements **Arc::Database** (p. 139).

6.174.2.2 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** (p. 139).

6.174.2.3 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** (p. 139).

6.174.2.4 virtual bool Arc::MySQLDatabase::isconnected () const [inline, virtual]

Get the connection status

Implements **Arc::Database** (p. 139).

6.174.2.5 virtual bool Arc::MySQLDatabase::shutdown () [virtual]

Ask database server to shutdown

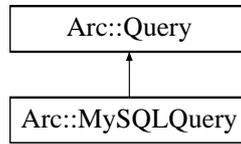
Implements **Arc::Database** (p. 139).

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

- MysqlWrapper.h

6.175 Arc::MySQLQuery Class Reference

Inheritance diagram for Arc::MySQLQuery::



Public Member Functions

- virtual int **get_num_columns** ()
- 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)

6.175.1 Member Function Documentation

6.175.1.1 virtual bool Arc::MySQLQuery::execute (const std::string & sqlstr) [virtual]

Execute the query

Parameters:

sqlstr The sql sentence used to query

Implements **Arc::Query** (p. 356).

6.175.1.2 virtual bool Arc::MySQLQuery::get_array (std::string & sqlstr, QueryArrayResult & result, std::vector< std::string > & arguments) [virtual]

Query (p. 356) 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 exactly correspond with the parametes in sql sentence.

Implements **Arc::Query** (p. 357).

6.175.1.3 virtual int Arc::MySQLQuery::get_num_columns () [virtual]

Get the colum number in the query result

Implements **Arc::Query** (p. 357).

6.175.1.4 virtual int Arc::MySQLQuery::get_num_rows () [virtual]

Get the row number in the query result

Implements **Arc::Query** (p. 357).

6.175.1.5 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** (p. 357).

6.175.1.6 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** (p. 357).

6.175.1.7 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** (p. 358).

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

- MysqlWrapper.h

6.176 Arc::NS Class Reference

Public Member Functions

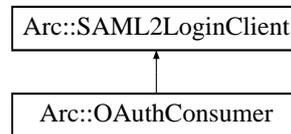
- `NS` (void)
- `NS` (const char *prefix, const char *uri)
- `NS` (const char *nslist[][2])

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

- `XMLNode.h`

6.177 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 *password=""*)

6.177.1 Detailed Description

The OAuth functionality depends on the availability of the liboauth C-bindings library

6.177.2 Constructor & Destructor Documentation

6.177.2.1 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.

6.177.3 Member Function Documentation

6.177.3.1 MCC_Status Arc::OAuthConsumer::approveCSR (const std::string *approve_page*)
[virtual]

Unsupported placeholder function until Confusa supports OAuth.

Implements **Arc::SAML2LoginClient** (p. 388).

6.177.3.2 MCC_Status Arc::OAuthConsumer::parseDN (std::string * dn) [virtual]

Unsupported placeholder function until Confusa supports OAuth.

Implements **Arc::SAML2LoginClient** (p. 388).

6.177.3.3 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** (p. 388).

6.177.3.4 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** (p. 388).

6.177.3.5 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.

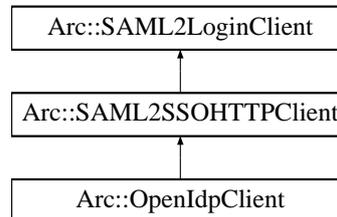
Implements **Arc::SAML2LoginClient** (p. 388).

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

- OAuthConsumer.h

6.178 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** ()

6.178.1 Member Function Documentation

6.178.1.1 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** (p. 389).

6.178.1.2 MCC_Status Arc::OpenIdpClient::processIdP2Confusa () [protected, virtual]

Redirects the user back from identity provider to the Confusa SP

Implements **Arc::SAML2SSOHTTPClient** (p. 390).

6.178.1.3 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 provisioned way

Implements **Arc::SAML2SSOHTTPClient** (p. 390).

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

- OpenIdpClient.h

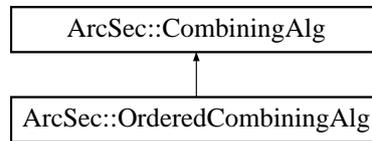
6.179 Arc::OptionParser Class Reference

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

- OptionParser.h

6.180 ArcSec::OrderedCombiningAlg Class Reference

Inheritance diagram for ArcSec::OrderedCombiningAlg::



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

- OrderedAlg.h

6.181 passwd Struct Reference

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

- win32.h

6.182 Arc::PathIterator Class Reference

Class to iterate through elements of path.

```
#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

6.182.1 Detailed Description

Class to iterate through elements of path.

6.182.2 Constructor & Destructor Documentation

6.182.2.1 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.

6.182.3 Member Function Documentation

6.182.3.1 Arc::PathIterator::operator bool () const

Return false when iterator moved outside path elements

6.182.3.2 std::string Arc::PathIterator::operator* () const

Returns part of initial path from first till and including current

6.182.3.3 PathIterator& Arc::PathIterator::operator++ ()

Advances iterator to point at next path element

6.182.3.4 PathIterator& Arc::PathIterator::operator-- ()

Moves iterator to element before current

6.182.3.5 std::string Arc::PathIterator::Rest () const

Returns part of initial path from one after current till end

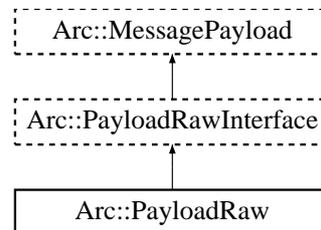
The documentation for this class was generated from the following file:

- **URL.h**

6.183 Arc::PayloadRaw Class Reference

Raw byte multi-buffer.

#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)

6.183.1 Detailed Description

Raw byte multi-buffer. This is implementation of **PayloadRawInterface** (p.317). Buffers are memory blocks logically placed one after another.

6.183.2 Constructor & Destructor Documentation

6.183.2.1 Arc::PayloadRaw::PayloadRaw (void) [inline]

List of handled buffers. Constructor. Created object contains no buffers.

6.183.2.2 virtual Arc::PayloadRaw::~~PayloadRaw (void) [virtual]

Destructor. Frees allocated buffers.

6.183.3 Member Function Documentation

6.183.3.1 virtual char* Arc::PayloadRaw::Buffer (unsigned int num = 0) [virtual]

Returns pointer to num`th buffer

Implements `Arc::PayloadRawInterface` (p. 317).

6.183.3.2 `virtual Size_t Arc::PayloadRaw::BufferPos (unsigned int num = 0) const [virtual]`

Returns position of *num*'th buffer

Implements `Arc::PayloadRawInterface` (p. 317).

6.183.3.3 `virtual Size_t Arc::PayloadRaw::BufferSize (unsigned int num = 0) const [virtual]`

Returns length of *num*'th buffer

Implements `Arc::PayloadRawInterface` (p. 318).

6.183.3.4 `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` (p. 318).

6.183.3.5 `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` (p. 318).

6.183.3.6 `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` (p. 318).

6.183.3.7 `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` (p. 318).

6.183.3.8 `virtual Size_t Arc::PayloadRaw::Size (void) const [virtual]`

Returns logical size of whole structure.

Implements `Arc::PayloadRawInterface` (p. 318).

6.183.3.9 `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** (p. 318).

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

- PayloadRaw.h

6.184 Arc::PayloadRawBuf Struct Reference

Data Fields

- int **size**
- int **length**
- bool **allocated**

6.184.1 Field Documentation

6.184.1.1 bool Arc::PayloadRawBuf::allocated

size of used memory - size of buffer

6.184.1.2 int Arc::PayloadRawBuf::length

size of allocated memory

6.184.1.3 int Arc::PayloadRawBuf::size

pointer to buffer in memory

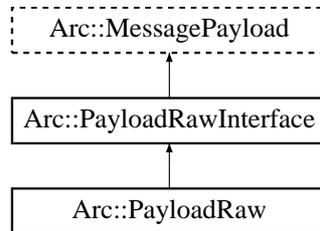
The documentation for this struct was generated from the following file:

- PayloadRaw.h

6.185 Arc::PayloadRawInterface Class Reference

Random Access Payload for **Message** (p. 286) objects.

#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

6.185.1 Detailed Description

Random Access Payload for **Message** (p. 286) objects. This class is a virtual interface for managing **Message** (p. 286) 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.

6.185.2 Member Function Documentation

6.185.2.1 virtual char* Arc::PayloadRawInterface::Buffer (unsigned int *num*) [pure virtual]

Returns pointer to num'th buffer

Implemented in **Arc::PayloadRaw** (p. 313).

6.185.2.2 virtual Size_t Arc::PayloadRawInterface::BufferPos (unsigned int *num*) const [pure virtual]

Returns position of num'th buffer

Implemented in **Arc::PayloadRaw** (p. 314).

6.185.2.3 virtual Size_t Arc::PayloadRawInterface::BufferSize (unsigned int *num*) const [pure virtual]

Returns length of *num*'th buffer

Implemented in **Arc::PayloadRaw** (p. 314).

6.185.2.4 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** (p. 314).

6.185.2.5 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** (p. 314).

6.185.2.6 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** (p. 314).

6.185.2.7 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** (p. 314).

6.185.2.8 virtual Size_t Arc::PayloadRawInterface::Size (void) const [pure virtual]

Returns logical size of whole structure.

Implemented in **Arc::PayloadRaw** (p. 314).

6.185.2.9 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** (p. 314).

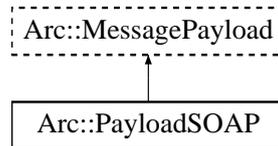
The documentation for this class was generated from the following file:

- PayloadRaw.h

6.186 Arc::PayloadSOAP Class Reference

Payload of **Message** (p. 286) with SOAP content.

#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)

6.186.1 Detailed Description

Payload of **Message** (p. 286) with SOAP content. This class combines **MessagePayload** (p. 296) with SOAPEnvelope to make it possible to pass SOAP messages through **MCC** (p. 274) chain.

6.186.2 Constructor & Destructor Documentation

6.186.2.1 Arc::PayloadSOAP::PayloadSOAP (const NS & ns, bool fault = false)

Constructor - creates new **Message** (p. 286) payload

6.186.2.2 Arc::PayloadSOAP::PayloadSOAP (const SOAPEnvelope & soap)

Constructor - creates **Message** (p. 286) payload from SOAP document. Provided SOAP document is copied to new object.

6.186.2.3 Arc::PayloadSOAP::PayloadSOAP (const MessagePayload & source)

Constructor - creates SOAP message from payload. **PayloadRawInterface** (p. 317) and derived classes are supported.

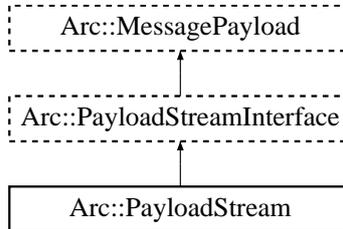
The documentation for this class was generated from the following file:

- PayloadSOAP.h

6.187 Arc::PayloadStream Class Reference

POSIX handle as Payload.

#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

Protected Attributes

- int **handle_**
- bool **seekable_**

6.187.1 Detailed Description

POSIX handle as Payload. This is an implemetation of **PayloadStreamInterface** (p.324) for generic POSIX handle.

6.187.2 Constructor & Destructor Documentation

6.187.2.1 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.

6.187.2.2 virtual Arc::PayloadStream::~~PayloadStream (void) [inline, virtual]

Destructor.

6.187.3 Member Function Documentation**6.187.3.1 virtual std::string Arc::PayloadStream::Get (void) [inline, virtual]**

Read as many as possible (sane amount) of bytes.

Implements **Arc::PayloadStreamInterface** (p. 324).

References `Get()`.

Referenced by `Get()`.

6.187.3.2 virtual bool Arc::PayloadStream::Get (std::string & buf) [virtual]

Read as many as possible (sane amount) of bytes into buf.

Implements **Arc::PayloadStreamInterface** (p. 324).

6.187.3.3 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** (p. 325).

6.187.3.4 virtual Arc::PayloadStream::operator bool (void) [inline, virtual]

Returns true if stream is valid.

Implements **Arc::PayloadStreamInterface** (p. 325).

References `handle_`.

6.187.3.5 virtual bool Arc::PayloadStream::operator! (void) [inline, virtual]

Returns true if stream is invalid.

Implements **Arc::PayloadStreamInterface** (p. 325).

References `handle_`.

6.187.3.6 virtual Size_t Arc::PayloadStream::Pos (void) const [inline, virtual]

Returns current position in stream if supported.

Implements **Arc::PayloadStreamInterface** (p. 325).

6.187.3.7 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** (p. 325).

References Put().

Referenced by Put().

6.187.3.8 virtual bool Arc::PayloadStream::Put (const std::string & buf) [inline, virtual]

Push information from 'buf' into stream. Returns true on success.

Implements **Arc::PayloadStreamInterface** (p. 325).

References Put().

Referenced by Put().

6.187.3.9 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** (p. 325).

6.187.3.10 virtual Size_t Arc::PayloadStream::Size (void) const [inline, virtual]

Returns size of underlying object if supported.

Implements **Arc::PayloadStreamInterface** (p. 325).

6.187.3.11 virtual void Arc::PayloadStream::Timeout (int to) [inline, virtual]

Set current timeout for **Get()** (p. 321) and **Put()** (p. 322) operations.

Implements **Arc::PayloadStreamInterface** (p. 326).

6.187.3.12 virtual int Arc::PayloadStream::Timeout (void) const [inline, virtual]

Query (p. 356) current timeout for **Get()** (p. 321) and **Put()** (p. 322) operations.

Implements **Arc::PayloadStreamInterface** (p. 326).

6.187.4 Field Documentation

6.187.4.1 int Arc::PayloadStream::handle_ [protected]

Timeout for read/write operations

Referenced by operator bool(), and operator!().

6.187.4.2 bool Arc::PayloadStream::seekable_ [protected]

Handle for operations

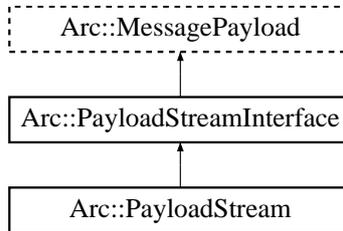
The documentation for this class was generated from the following file:

- PayloadStream.h

6.188 Arc::PayloadStreamInterface Class Reference

Stream-like Payload for **Message** (p. 286) object.

#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

6.188.1 Detailed Description

Stream-like Payload for **Message** (p. 286) object. This class is a virtual interface for managing stream-like source and destination. It's supposed to be passed through **MCC** (p. 274) chain as payload of **Message** (p. 286). It must be treated by MCCs and Services as dynamic payload. This class is purely virtual.

6.188.2 Member Function Documentation

6.188.2.1 virtual std::string Arc::PayloadStreamInterface::Get (void) [pure virtual]

Read as many as possible (sane amount) of bytes.

Implemented in **Arc::PayloadStream** (p. 321).

6.188.2.2 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** (p. 321).

6.188.2.3 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** (p. 321).

6.188.2.4 virtual Arc::PayloadStreamInterface::operator bool (void) [pure virtual]

Returns true if stream is valid.

Implemented in **Arc::PayloadStream** (p. 321).

6.188.2.5 virtual bool Arc::PayloadStreamInterface::operator! (void) [pure virtual]

Returns true if stream is invalid.

Implemented in **Arc::PayloadStream** (p. 321).

6.188.2.6 virtual Size_t Arc::PayloadStreamInterface::Pos (void) const [pure virtual]

Returns current position in stream if supported.

Implemented in **Arc::PayloadStream** (p. 321).

6.188.2.7 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** (p. 321).

6.188.2.8 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** (p. 322).

6.188.2.9 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** (p. 322).

6.188.2.10 virtual Size_t Arc::PayloadStreamInterface::Size (void) const [pure virtual]

Returns size of underlying object if supported.

Implemented in **Arc::PayloadStream** (p. 322).

6.188.2.11 virtual void Arc::PayloadStreamInterface::Timeout (int *to*) [pure virtual]

Set current timeout for **Get()** (p. 324) and **Put()** (p. 325) operations.

Implemented in **Arc::PayloadStream** (p. 322).

6.188.2.12 virtual int Arc::PayloadStreamInterface::Timeout (void) const [pure virtual]

Query (p. 356) current timeout for **Get()** (p. 324) and **Put()** (p. 325) operations.

Implemented in **Arc::PayloadStream** (p. 322).

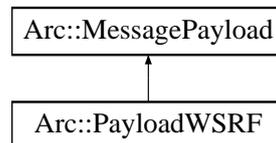
The documentation for this class was generated from the following file:

- PayloadStream.h

6.189 Arc::PayloadWSRF Class Reference

This class combines **MessagePayload** (p. 296) with **WSRF** (p. 458).

#include <PayloadWSRF.h> Inheritance diagram for Arc::PayloadWSRF::



Public Member Functions

- **PayloadWSRF** (const SOAPEnvelope &soap)
- **PayloadWSRF** (WSRF &wsrp)
- **PayloadWSRF** (const **MessagePayload** &source)

6.189.1 Detailed Description

This class combines **MessagePayload** (p. 296) with **WSRF** (p. 458). It's intention is to make it possible to pass **WSRF** (p. 458) messages through **MCC** (p. 274) chain as one more Payload type.

6.189.2 Constructor & Destructor Documentation

6.189.2.1 Arc::PayloadWSRF::PayloadWSRF (const SOAPEnvelope & soap)

Constructor - creates **Message** (p. 286) payload from SOAP message. Returns invalid **WSRF** (p. 458) if SOAP does not represent WS-ResourceProperties

6.189.2.2 Arc::PayloadWSRF::PayloadWSRF (WSRF & wrsp)

Constructor - creates **Message** (p. 286) payload with acquired **WSRF** (p. 458) message. **WSRF** (p. 458) message will be destroyed by destructor of this object.

6.189.2.3 Arc::PayloadWSRF::PayloadWSRF (const MessagePayload & source)

Constructor - creates **WSRF** (p. 458) message from payload. All classes derived from SOAPEnvelope are supported.

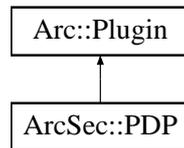
The documentation for this class was generated from the following file:

- PayloadWSRF.h

6.190 ArcSec::PDP Class Reference

Base class for **Policy** (p. 345) Decision Point plugins.

#include <PDP.h> Inheritance diagram for ArcSec::PDP::



6.190.1 Detailed Description

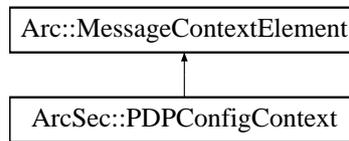
Base class for **Policy** (p. 345) Decision Point plugins. This virtual class defines method `isPermitted()` which processes security related information/attributes in `Message` and makes security decision - permit (true) or deny (false). Configuration of **PDP** (p. 328) is consumed during creation of instance through XML subtree fed to constructor.

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

- PDP.h

6.191 ArcSec::PDPCfgContext Class Reference

Inheritance diagram for ArcSec::PDPCfgContext::

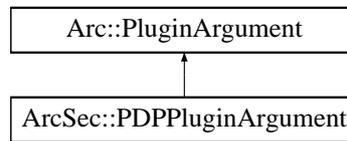


The documentation for this class was generated from the following file:

- PDP.h

6.192 ArcSec::PDPPluginArgument Class Reference

Inheritance diagram for ArcSec::PDPPluginArgument::



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

- PDP.h

6.193 Arc::Period Class Reference

Public Member Functions

- **Period** ()
- **Period** (const time_t &)
- **Period** (const std::string &, PeriodBase base=PeriodSeconds)
- **Period** & **operator=** (const time_t &)
- **Period** & **operator=** (const **Period** &)
- void **SetPeriod** (const 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

6.193.1 Constructor & Destructor Documentation

6.193.1.1 Arc::Period::Period ()

Default constructor. The period is set to 0 length.

6.193.1.2 Arc::Period::Period (const time_t &)

Constructor that takes a time_t variable and stores it.

6.193.1.3 Arc::Period::Period (const std::string &, PeriodBase *base* = PeriodSeconds)

Constructor that tries to convert a string.

6.193.2 Member Function Documentation

6.193.2.1 time_t Arc::Period::GetPeriod () const

gets the period

6.193.2.2 const sigc::slot<const char*>* Arc::Period::istr () const

For use with **IString** (p. 249)

6.193.2.3 Arc::Period::operator std::string () const

Returns a string representation of the period.

6.193.2.4 bool Arc::Period::operator!=(const Period &) const

Comparing two **Period** (p. 331) objects.

6.193.2.5 bool Arc::Period::operator<(const Period &) const

Comparing two **Period** (p. 331) objects.

6.193.2.6 bool Arc::Period::operator<=(const Period &) const

Comparing two **Period** (p. 331) objects.

6.193.2.7 Period& Arc::Period::operator=(const Period &)

Assignment operator from a **Period** (p. 331).

6.193.2.8 Period& Arc::Period::operator=(const time_t &)

Assignment operator from a time_t.

6.193.2.9 bool Arc::Period::operator==(const Period &) const

Comparing two **Period** (p. 331) objects.

6.193.2.10 bool Arc::Period::operator>(const Period &) const

Comparing two **Period** (p. 331) objects.

6.193.2.11 bool Arc::Period::operator>=(const Period &) const

Comparing two **Period** (p. 331) objects.

6.193.2.12 void Arc::Period::SetPeriod(const time_t &)

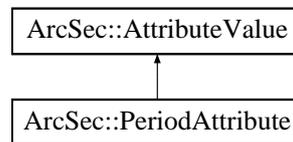
sets the period

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

- DateTime.h

6.194 ArcSec::PeriodAttribute Class Reference

#include <DateTimeAttribute.h>Inheritance diagram for ArcSec::PeriodAttribute::



Public Member Functions

- virtual std::string **encode** ()
- virtual std::string **getType** ()
- virtual std::string **getId** ()

6.194.1 Detailed Description

Format: datetime"/"duration datetime"/"datetime duration"/"datetime

6.194.2 Member Function Documentation

6.194.2.1 virtual std::string ArcSec::PeriodAttribute::encode () [virtual]

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 78).

6.194.2.2 virtual std::string ArcSec::PeriodAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

6.194.2.3 virtual std::string ArcSec::PeriodAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

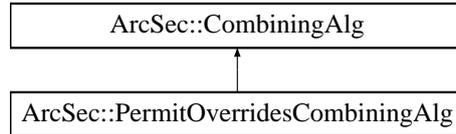
The documentation for this class was generated from the following file:

- DateTimeAttribute.h

6.195 ArcSec::PermitOverridesCombiningAlg Class Reference

Implement the "Permit-Overrides" algorithm.

```
#include <PermitOverridesAlg.h> Inheritance diagram for Arc-
Sec::PermitOverridesCombiningAlg::
```



Public Member Functions

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

6.195.1 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".

6.195.2 Member Function Documentation

6.195.2.1 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.
- policies* This is a container which contains policy objects.

Returns:

The combined result according to the algorithm.

Implements ArcSec::CombiningAlg (p. 111).

6.195.2.2 virtual const std::string& ArcSec::PermitOverridesCombiningAlg::getalgId (void) const [inline, virtual]

Get the identifier

Implements ArcSec::CombiningAlg (p. 111).

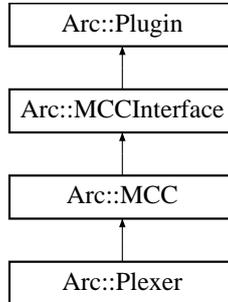
The documentation for this class was generated from the following file:

- [PermitOverridesAlg.h](#)

6.196 Arc::Plexer Class Reference

The **Plexer** (p. 336) class, used for routing messages to services.

`#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

6.196.1 Detailed Description

The **Plexer** (p. 336) class, used for routing messages to services. This is the **Plexer** (p. 336) class. Its purpose is to route incoming messages to appropriate Services and **MCC** (p. 274) chains.

6.196.2 Constructor & Destructor Documentation

6.196.2.1 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.

6.196.2.2 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.

6.196.3 Member Function Documentation

6.196.3.1 virtual void Arc::Plexer::Next (MCCInterface * *next*, const std::string & *label*) [virtual]

Add reference to next **MCC** (p. 274) in chain. This method is called by **Loader** (p. 263) for every potentially labeled link to next component which implements **MCCInterface** (p. 280). If next is set NULL corresponding link is removed.

Reimplemented from **Arc::MCC** (p. 275).

6.196.3.2 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** (p. 275).

6.196.4 Field Documentation

6.196.4.1 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** (p. 276).

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

- Plexer.h

6.197 Arc::PlexerEntry Class Reference

A pair of label (regex) and pointer to service.

```
#include <Plexer.h>
```

6.197.1 Detailed Description

A pair of label (regex) and pointer to service. A helper class that stores a label (regex) and a pointer to a service.

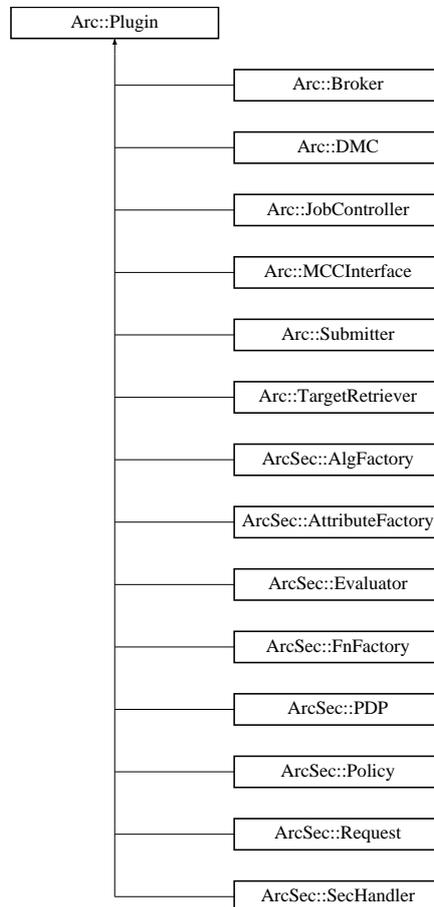
The documentation for this class was generated from the following file:

- Plexer.h

6.198 Arc::Plugin Class Reference

Base class for loadable ARC components.

#include <Plugin.h> Inheritance diagram for Arc::Plugin::



6.198.1 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.

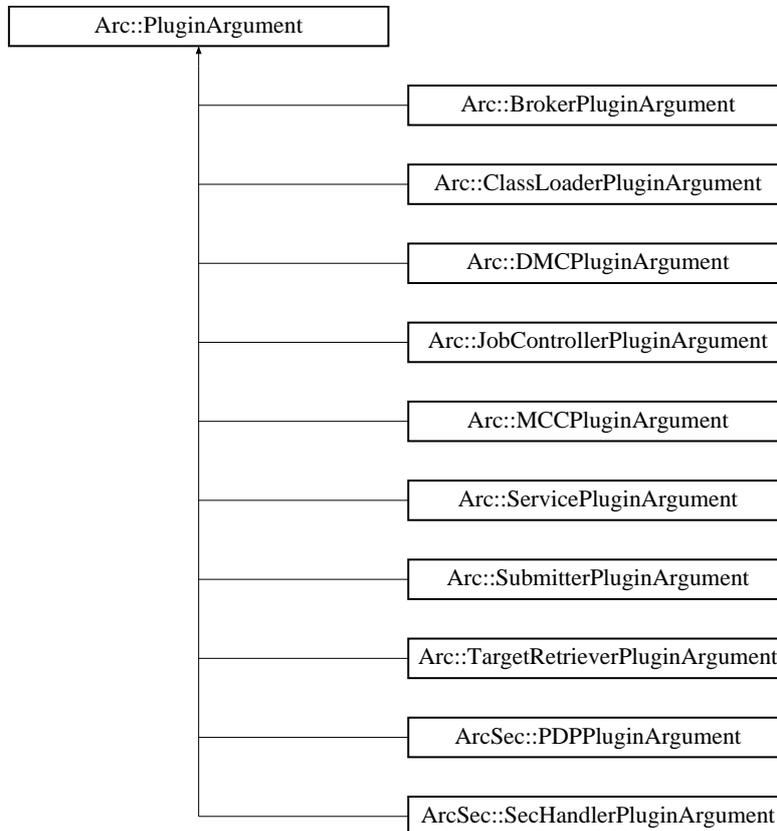
The documentation for this class was generated from the following file:

- Plugin.h

6.199 Arc::PluginArgument Class Reference

Base class for passing arguments to loadable ARC components.

#include <Plugin.h> Inheritance diagram for Arc::PluginArgument::



Public Member Functions

- **PluginsFactory * get_factory** (void)
- **Glib::Module * get_module** (void)

6.199.1 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.

6.199.2 Member Function Documentation

6.199.2.1 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.

6.199.2.2 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 destroyed. 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

6.200 Arc::PluginDescriptor Struct Reference

Description of ARC lodable component.

```
#include <Plugin.h>
```

6.200.1 Detailed Description

Description of ARC lodable component.

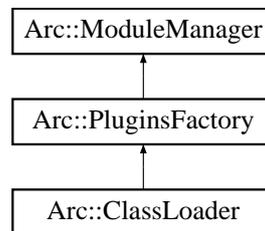
The documentation for this struct was generated from the following file:

- Plugin.h

6.201 Arc::PluginsFactory Class Reference

Generic ARC plugins loader.

#include <Plugin.h> Inheritance diagram for Arc::PluginsFactory::



Public Member Functions

- **PluginsFactory** (const **Config** &cfg)
- **Plugin** * **get_instance** (const std::string &kind, **PluginArgument** *arg)
- bool **load** (const std::string &name)

6.201.1 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.

6.201.2 Constructor & Destructor Documentation

6.201.2.1 Arc::PluginsFactory::PluginsFactory (const Config & cfg)

Constructor - accepts configuration (not yet used) meant to tune loading of modules.

6.201.3 Member Function Documentation

6.201.3.1 Plugin* Arc::PluginsFactory::get_instance (const std::string & kind, PluginArgument * arg)

These methods load shared library 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** (p. 343) class. Returns created instance.

6.201.3.2 bool Arc::PluginsFactory::load (const std::string & name)

These methods load shared library named lib' name' and check if it contains ARC plugins of specified 'kind'. If there are no specified plugins or if library does not contain any plugins it is unloaded. All loaded plugins are also registered in internal list of this instance of **PluginsFactory** (p. 343) class. Returns true if library was loaded.

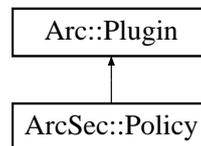
The documentation for this class was generated from the following file:

- Plugin.h

6.202 ArcSec::Policy Class Reference

Interface for containing and processing different types of policy.

`#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

6.202.1 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.

6.202.2 Constructor & Destructor Documentation

6.202.2.1 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.

6.202.2.2 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** (p. 205) which includes the factory objects for combining algorithm and function

6.202.3 Member Function Documentation

6.202.3.1 virtual void ArcSec::Policy::addPolicy (Policy *pl) [inline, virtual]

Add a policy element to into "this" object

6.202.3.2 virtual Result ArcSec::Policy::eval (EvaluationCtx *) [pure virtual]

Evaluate policy For the <Rule> of **Arc** (p.23), only get the "Effect" from rules; For the <Policy> of **Arc** (p. 23), combine the evaluation result from <Rule>; For the <Rule> of XACML, 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>

6.202.3.3 virtual std::string ArcSec::Policy::getEffect () const [pure virtual]

Get the "Effect" attribute

6.202.3.4 virtual const char* ArcSec::Policy::getEvalName () const [pure virtual]

Get the name of **Evaluator** (p. 202) which can evaluate this policy

6.202.3.5 virtual EvalResult& ArcSec::Policy::getEvalResult () [pure virtual]

Get evaluation result

6.202.3.6 virtual const char* ArcSec::Policy::getName () const [pure virtual]

Get the name of this policy

6.202.3.7 virtual void ArcSec::Policy::make_policy () [inline, virtual]

Parse XMLNode, and construct the low-level Rule object

6.202.3.8 virtual void ArcSec::Policy::setEvalResult (EvalResult & res) [pure virtual]

Set evaluation result

6.202.3.9 virtual void ArcSec::Policy::setEvaluatorContext (EvaluatorContext *) [inline, virtual]

Set **Evaluator** (p. 202) Context for the usage in creating low-level policy object

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

- Policy.h

6.203 ArcSec::PolicyStore::PolicyElement Class Reference

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

- PolicyStore.h

6.204 ArcSec::PolicyParser Class Reference

A interface which will isolate the policy object from actual policy storage (files, urls, database).

```
#include <PolicyParser.h>
```

Public Member Functions

- virtual **Policy * parsePolicy** (const **Source** &source, std::string policyclassname, **EvaluatorContext** *ctx)

6.204.1 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.).

6.204.2 Member Function Documentation

6.204.2.1 virtual **Policy*** ArcSec::PolicyParser::parsePolicy (const **Source** & *source*, std::string *policyclassname*, **EvaluatorContext** * *ctx*) [**virtual**]

Parse policy

Parameters:

source location of the policy

policyclassname name of the policy for ClassLoader

ctx **EvaluatorContext** (p. 205) which includes the **Factory

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

- PolicyParser.h

6.205 ArcSec::PolicyStore Class Reference

Storage place for policy objects.

```
#include <PolicyStore.h>
```

Data Structures

- class **PolicyElement**

Public Member Functions

- **PolicyStore** (const std::string &alg, const std::string &policyclassname, **EvaluatorContext** *ctx)

6.205.1 Detailed Description

Storage place for policy objects.

6.205.2 Constructor & Destructor Documentation

6.205.2.1 ArcSec::PolicyStore::PolicyStore (const std::string & *alg*, const std::string & *policyclassname*, **EvaluatorContext** * *ctx*)

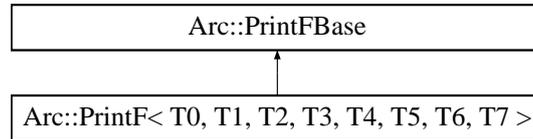
Creates policy store with specified combing algorithm (*alg* - not used yet), policy name (*policyclassname*) and context (*ctx*)

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

- PolicyStore.h

6.206 Arc::Printf< T0, T1, T2, T3, T4, T5, T6, T7 > Class Template Reference

Inheritance diagram for Arc::Printf< T0, T1, T2, T3, T4, T5, T6, T7 >::



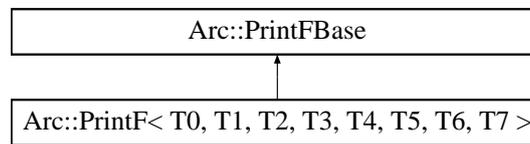
```
template<class T0 = int, class T1 = int, class T2 = int, class T3 = int, class T4 = int, class T5 = int, class T6 = int, class T7 = int> class Arc::Printf< T0, T1, T2, T3, T4, T5, T6, T7 >
```

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

- IString.h

6.207 Arc::PrintFBase Class Reference

Inheritance diagram for Arc::PrintFBase::

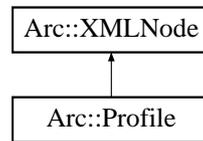


The documentation for this class was generated from the following file:

- IString.h

6.208 Arc::Profile Class Reference

Inheritance diagram for Arc::Profile::



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

- Profile.h

6.209 ArcCredential::PROXYCERTINFO_st Struct Reference

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

- Proxycertinfo.h

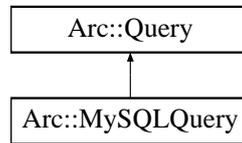
6.210 ArcCredential::PROXYPOLICY_st Struct Reference

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

- Proxycertinfo.h

6.211 Arc::Query Class Reference

Inheritance diagram for Arc::Query::



Public Member Functions

- **Query** ()
- **Query** (**Database** *db)
- virtual **~Query** ()
- virtual int **get_num_columns** ()=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

6.211.1 Constructor & Destructor Documentation

6.211.1.1 Arc::Query::Query () [inline]

Default constructor

6.211.1.2 Arc::Query::Query (**Database** *db) [inline]

Constructor

Parameters:

db The database object which will be used by **Query** (p. 356) class to get the database connection

6.211.1.3 virtual Arc::Query::~~Query () [inline, virtual]

Destructor

6.211.2 Member Function Documentation

6.211.2.1 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** (p. 302).

6.211.2.2 virtual bool Arc::Query::get_array (std::string & sqlstr, QueryArrayResult & result, std::vector< std::string > & arguments) [pure virtual]

Query (p. 356) 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 exactly correspond with the parametes in sql sentence.

Implemented in **Arc::MySQLQuery** (p. 302).

6.211.2.3 virtual int Arc::Query::get_num_columns () [pure virtual]

Get the colum number in the query result

Implemented in **Arc::MySQLQuery** (p. 302).

6.211.2.4 virtual int Arc::Query::get_num_rows () [pure virtual]

Get the row number in the query result

Implemented in **Arc::MySQLQuery** (p. 303).

6.211.2.5 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** (p. 303).

6.211.2.6 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** (p. 303).

6.211.2.7 `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` (p. 303).

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

- DBInterface.h

6.212 Arc::Range< T > Class Template Reference

```
template<class T> class Arc::Range< T >
```

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

- JobDescription.h

6.213 Arc::Register_Info_Type Struct Reference

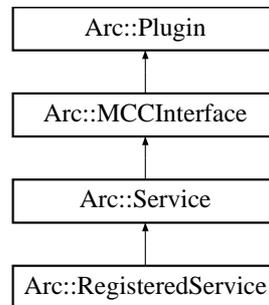
The documentation for this struct was generated from the following file:

- InfoRegister.h

6.214 Arc::RegisteredService Class Reference

Service (p. 404) - last component in a **Message** (p. 286) Chain.

#include <RegisteredService.h> Inheritance diagram for Arc::RegisteredService::



Public Member Functions

- **RegisteredService** (**Config** *)

6.214.1 Detailed Description

Service (p. 404) - last component in a **Message** (p. 286) Chain. This class which defines interface and common functionality for every **Service** (p. 404) plugin. Interface is made of method **process()** (p. 280) which is called by **Plexer** (p. 336) or **MCC** (p. 274) class. There is one **Service** (p. 404) object created for every service description processed by **Loader** (p. 263) class objects. Classes derived from **Service** (p. 404) class must implement **process()** (p. 280) method of **MCCInterface** (p. 280). It is up to developer how internal state of service is stored and communicated to other services and external utilites. **Service** (p. 404) 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 be linked to SOAP **MCC** (p. 274) it must accept and generate messages with **PayloadSOAP** (p. 319) payload. Method **process()** (p. 280) of class derived from **Service** (p. 404) 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 .

6.214.2 Constructor & Destructor Documentation

6.214.2.1 Arc::RegisteredService::RegisteredService (Config *)

Example constructor - Server takes at least it's configuration subtree

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

- RegisteredService.h

6.215 Arc::RegularExpression Class Reference

A regular expression class.

```
#include <ArcRegex.h>
```

Public Member Functions

- **RegularExpression** ()
- **RegularExpression** (std::string pattern)
- **RegularExpression** (const **RegularExpression** ®ex)
- **~RegularExpression** ()
- const **RegularExpression** & **operator=** (const **RegularExpression** ®ex)
- 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

6.215.1 Detailed Description

A regular expression class. This class is a wrapper around the functions provided in regex.h.

6.215.2 Member Function Documentation

6.215.2.1 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'.

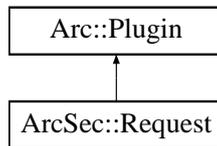
The documentation for this class was generated from the following file:

- ArcRegex.h

6.216 ArcSec::Request Class Reference

Base class/Interface for request, includes a container for RequestItems and some operations.

#include <Request.h> Inheritance diagram for ArcSec::Request::



Public Member Functions

- virtual ReqItemList **getRequestItems** () const
- virtual void **setRequestItems** (ReqItemList sl)
- virtual void **addRequestItem** (Attrs &sub, Attrs &res, Attrs &act, Attrs &ctx)
- 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 &)

6.216.1 Detailed Description

Base class/Interface for request, includes a container for RequestItems and some operations. A **Request** (p. 363) object can has a few <subjects, actions, objects> tuples, i.e. **RequestItem** (p. 366) The **Request** (p. 363) class and any customized class which inherit from it, should be loadable, which means these classes can be dynamically loaded according to the configuration information, see the example configuration below: <Service name="pdp.service" id="pdp_service"> <pdp:PDPCfg> <.....> <pdp:**Request** (p. 363) name="arc.request" /> <.....> </pdp:PDPCfg> </Service>

There can be different types of subclass which inherit **Request** (p. 363), such like XACMLRequest, ArcRequest, GACLRequest

6.216.2 Constructor & Destructor Documentation

6.216.2.1 ArcSec::Request::Request () [inline]

Default constructor

6.216.2.2 ArcSec::Request::Request (const Source &) [inline]

Constructor: Parse request information from a xml stucture in memory

6.216.3 Member Function Documentation

6.216.3.1 `virtual void ArcSec::Request::addRequestItem (Attrs & sub, Attrs & res, Attrs & act, Attrs & ctx) [inline, virtual]`

Add request tuple from non-XMLNode

6.216.3.2 `virtual const char* ArcSec::Request::getEvalName () const [pure virtual]`

Get the name of corresponding evaluator

6.216.3.3 `virtual const char* ArcSec::Request::getName () const [pure virtual]`

Get the name of this request

6.216.3.4 `virtual ReqItemList ArcSec::Request::getRequestItems () const [inline, virtual]`

Get all the **RequestItem** (p. 366) inside **RequestItem** (p. 366) container

6.216.3.5 `virtual void ArcSec::Request::make_request () [pure virtual]`

Create the objects included in **Request** (p. 363) according to the node attached to the **Request** (p. 363) object

6.216.3.6 `virtual void ArcSec::Request::setAttributeFactory (AttributeFactory * attributefactory) [pure virtual]`

Set the attribute factory for the usage of **Request** (p. 363)

6.216.3.7 `virtual void ArcSec::Request::setRequestItems (ReqItemList sl) [inline, virtual]`

Set the content of the container

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

- Request.h

6.217 ArcSec::RequestAttribute Class Reference

Wrapper which includes **AttributeValue** (p. 77) object which is generated according to date type of one specific node in Request.xml.

```
#include <RequestAttribute.h>
```

Public Member Functions

- **RequestAttribute** (**Arc::XMLNode** &node, **AttributeFactory** *attrfactory)
- **RequestAttribute** & **duplicate** (**RequestAttribute** &)

6.217.1 Detailed Description

Wrapper which includes **AttributeValue** (p. 77) object which is generated according to date type of one specific node in Request.xml.

6.217.2 Constructor & Destructor Documentation

6.217.2.1 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>

6.217.3 Member Function Documentation

6.217.3.1 RequestAttribute& ArcSec::RequestAttribute::duplicate (RequestAttribute &)

Duplicate the parameter into "this"

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

- RequestAttribute.h

6.218 ArcSec::RequestItem Class Reference

Interface for request item container, <subjects, actions, objects, ctxs> tuple.

```
#include <RequestItem.h>
```

Public Member Functions

- **RequestItem** (**Arc::XMLNode** &, **AttributeFactory** *)

6.218.1 Detailed Description

Interface for request item container, <subjects, actions, objects, ctxs> tuple.

6.218.2 Constructor & Destructor Documentation

6.218.2.1 ArcSec::RequestItem::RequestItem (Arc::XMLNode &, AttributeFactory *) [inline]

Constructor

Parameters:

node The XMLNode structure of the request item

attributefactory The **AttributeFactory** (p.72) which will be used to generate **RequestAttribute** (p.365)

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

- RequestItem.h

6.219 ArcSec::RequestTuple Class Reference

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

- EvaluationCtx.h

6.220 Arc::ResourceSlotType Class Reference

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

- JobDescription.h

6.221 Arc::ResourceType Class Reference

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

- JobDescription.h

6.222 Arc::ResourceTargetType Class Reference

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

- JobDescription.h

6.223 ArcSec::Response Class Reference

Container for the evaluation results.

```
#include <Response.h>
```

6.223.1 Detailed Description

Container for the evaluation results.

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

- Response.h

6.224 ArcSec::ResponseItem Class Reference

Evaluation result concerning one **RequestTuple** (p. 367).

```
#include <Response.h>
```

6.224.1 Detailed Description

Evaluation result concerning one **RequestTuple** (p. 367). Include the **RequestTuple** (p. 367), 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

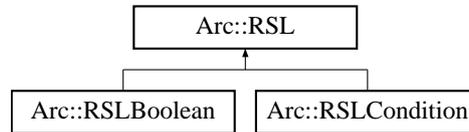
6.225 ArcSec::ResponseList Class Reference

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

- Response.h

6.226 Arc::RSL Class Reference

Inheritance diagram for Arc::RSL::

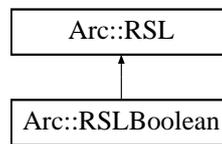


The documentation for this class was generated from the following file:

- RSLParser.h

6.227 Arc::RSLBoolean Class Reference

Inheritance diagram for Arc::RSLBoolean::

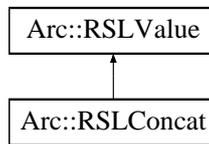


The documentation for this class was generated from the following file:

- RSLParser.h

6.228 Arc::RSLConcat Class Reference

Inheritance diagram for Arc::RSLConcat::

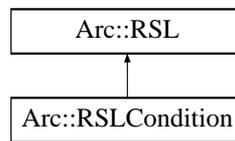


The documentation for this class was generated from the following file:

- RSLParser.h

6.229 Arc::RSLCondition Class Reference

Inheritance diagram for Arc::RSLCondition::

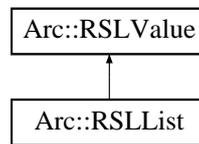


The documentation for this class was generated from the following file:

- RSLParser.h

6.230 Arc::RSLList Class Reference

Inheritance diagram for Arc::RSLList::

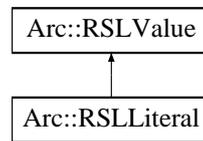


The documentation for this class was generated from the following file:

- RSLParser.h

6.231 Arc::RSLLiteral Class Reference

Inheritance diagram for Arc::RSLLiteral:



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

- RSLParser.h

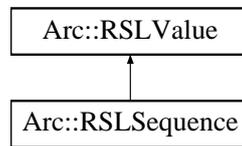
6.232 Arc::RSLParser Class Reference

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

- RSLParser.h

6.233 Arc::RSLSequence Class Reference

Inheritance diagram for Arc::RSLSequence::

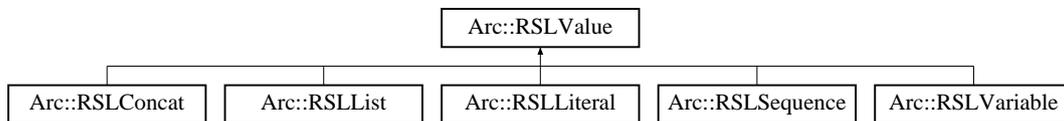


The documentation for this class was generated from the following file:

- RSLParser.h

6.234 Arc::RSLValue Class Reference

Inheritance diagram for Arc::RSLValue::

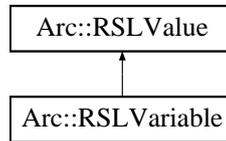


The documentation for this class was generated from the following file:

- RSLParser.h

6.235 Arc::RSLVariable Class Reference

Inheritance diagram for Arc::RSLVariable::



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

- RSLParser.h

6.236 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)
- **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)

6.236.1 Detailed Description

This class runs external executable. It is possible to read/write it's standard handles or to redirect them to std::string elements.

6.236.2 Constructor & Destructor Documentation

6.236.2.1 Arc::Run::Run (const std::string & *cmdline*)

Constructor preapres object to run cmdline

6.236.2.2 Arc::Run::Run (const std::list< std::string > & *argv*)

Constructor preapres object to run executable and arguments specified in argv

6.236.2.3 Arc::Run::~~Run (void)

Destructor kill running executable and releases associated resources

6.236.3 Member Function Documentation

6.236.3.1 void Arc::Run::AssignStderr (std::string & *str*)

Associate stderr handle of executable with string. This method must be called before **Start()** (p. 386). *str* object must be valid as long as this object exists.

6.236.3.2 void Arc::Run::AssignStdin (std::string & *str*)

Associate stdin handle of executable with string. This method must be called before **Start()** (p. 386). *str* object must be valid as long as this object exists.

6.236.3.3 void Arc::Run::AssignStdout (std::string & *str*)

Associate stdout handle of executable with string. This method must be called before **Start()** (p. 386). *str* object must be valid as long as this object exists.

6.236.3.4 void Arc::Run::AssignWorkingDirectory (std::string & *wd*) [inline]

Assign working directory of the running process

6.236.3.5 void Arc::Run::CloseStderr (void)

Closes pipe associated with stderr handle

6.236.3.6 void Arc::Run::CloseStdin (void)

Closes pipe associated with stdin handle

6.236.3.7 void Arc::Run::CloseStdout (void)

Closes pipe associated with stdout handle

6.236.3.8 void Arc::Run::KeepStderr (bool *keep* = true)

Keep stderr same as parent's if *keep* = true

6.236.3.9 void Arc::Run::KeepStdin (bool *keep* = true)

Keep stdin same as parent's if *keep* = true

6.236.3.10 void Arc::Run::KeepStdout (bool *keep* = true)

Keep stdout same as parent's if *keep* = true

6.236.3.11 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

6.236.3.12 Arc::Run::operator bool (void) [inline]

Returns true if object is valid

6.236.3.13 bool Arc::Run::operator! (void) [inline]

Returns true if object is invalid

6.236.3.14 int Arc::Run::ReadStderr (int *timeout*, char * *buf*, int *size*)

Read from stderr handle of running executable. This method may be used while stderr is directed to string. But result is unpredictable.

6.236.3.15 int Arc::Run::ReadStdout (int *timeout*, char * *buf*, int *size*)

Read from stdout handle of running executable. This method may be used while stdout is directed to string. But result is unpredictable.

6.236.3.16 int Arc::Run::Result (void) [inline]

Returns exit code of execution.

6.236.3.17 bool Arc::Run::Running (void)

Return true if execution is going on.

6.236.3.18 bool Arc::Run::Start (void)

Starts running executable. This method may be called only once.

6.236.3.19 bool Arc::Run::Wait (void)

Wait till execution finished

6.236.3.20 bool Arc::Run::Wait (int *timeout*)

Wait till execution finished or till timeout seconds expires. Returns true if execution is complete.

6.236.3.21 `int Arc::Run::WriteStdin (int timeout, const char * buf, int size)`

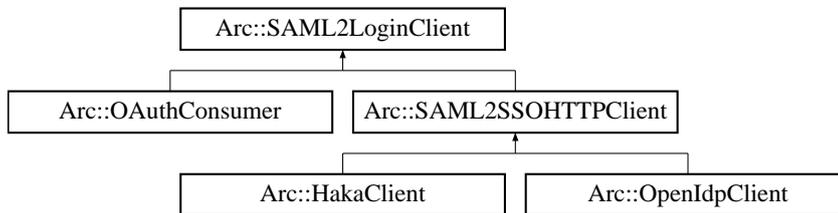
Write to stdin handle of running executable. This method may be used while stdin is directed to string. But result is unpredictable.

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

- Run.h

6.237 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** ()

6.237.1 Constructor & Destructor Documentation

6.237.1.1 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.

6.237.2 Member Function Documentation

6.237.2.1 MCC_Status Arc::SAML2LoginClient::findSimpleSAMLInstallation ()

find the location of the simplesamlphp installation on the SP side Will be stored in (*sso_pages)[SimpleSAML]

6.237.2.2 virtual MCC_Status Arc::SAML2LoginClient::processLogin (const std::string *username* = "", const std::string *password* = "") [pure virtual]

Base interface for all login procedures

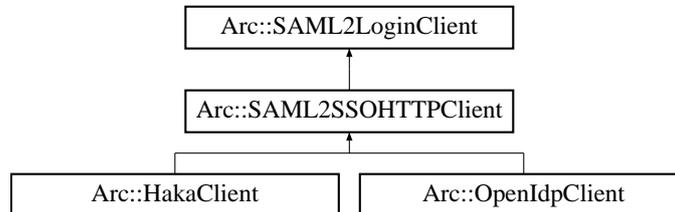
Implemented in **Arc::OAuthConsumer** (p. 306), and **Arc::SAML2SSOHTTPClient** (p. 390).

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

- SAML2LoginClient.h

6.238 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

6.238.1 Member Function Documentation

6.238.1.1 MCC_Status Arc::SAML2SSOHTTPClient::approveCSR (const std::string approve_page) [virtual]

Simulate click on the approve cert signing request link

Implements **Arc::SAML2LoginClient** (p. 388).

6.238.1.2 MCC_Status Arc::SAML2SSOHTTPClient::parseDN (std::string * dn) [virtual]

Parse the used DN from the Confusa about_you page

Implements **Arc::SAML2LoginClient** (p. 388).

6.238.1.3 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** (p. 227), and **Arc::OpenIdpClient** (p. 307).

6.238.1.4 virtual MCC_Status Arc::SAML2SSOHTTPClient::processIdP2Confusa ()
[protected, pure virtual]

Redirects the user back from identity provider to the Confusa SP

Implemented in Arc::HakaClient (p. 227), and Arc::OpenIdpClient (p. 307).

6.238.1.5 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 provisioned way

Implemented in Arc::HakaClient (p. 227), and Arc::OpenIdpClient (p. 307).

6.238.1.6 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 (p. 388).

6.238.1.7 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 (p. 388).

6.238.1.8 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 (p. 388).

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

- SAML2LoginClient.h

6.239 Arc::SAMLToken Class Reference

Class for manipulating SAML Token **Profile** (p. 353).

```
#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)

6.239.1 Detailed Description

Class for manipulating SAML Token **Profile** (p. 353). This class is for generating/consuming SAML Token profile. See WS-Security SAML Token **Profile** (p. 353) 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** (p. 353) 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** (p. 353) v1.1 specification) subject subject confirmation method.

About SAML version, the implementation can process SAML assertion with SAML version 1.1 and 2.0; can only generate SAML assertion with SAML version 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 (Alternatively the username/password authentication scheme or other different authentication scheme can also be used, unless the issuing authority can retrieve 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).

6.239.2 Member Enumeration Documentation

6.239.2.1 enum Arc::SAMLToken::SAMLVersion

Since the specification SAMLVersion is for distinguishing two types of saml version. It is used as the parameter of constructor.

6.239.3 Constructor & Destructor Documentation

6.239.3.1 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** (p. 391) object will be used for authentication.

Parameters:

soap The SOAP message which contains the **SAMLToken** (p. 391) in the soap header

6.239.3.2 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.

6.239.3.3 Arc::SAMLToken::~~SAMLToken (void)

Deconstructor. Nothing to be done except finalizing the xmlsec library.

6.239.4 Member Function Documentation

6.239.4.1 bool Arc::SAMLToken::Authenticate (void)

Check signature by using the cert information in soap message

6.239.4.2 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)** (p. 392) 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 with SAML assertion) by using the public key inside SAML assestion.

Parameters:

cafile ca file

capath ca directory

6.239.4.3 Arc::SAMLToken::operator bool (void)

Returns true of constructor succeeded

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

- SAMLToken.h

6.240 Arc::ScalableTime< T > Class Template Reference

`template<class T> class Arc::ScalableTime< T >`

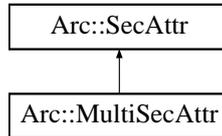
The documentation for this class was generated from the following file:

- JobDescription.h

6.241 Arc::SecAttr Class Reference

This is an abstract interface to a security attribute.

#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)

Static Public Attributes

- static **SecAttrFormat** ARCAuth
- static **SecAttrFormat** XACML
- static **SecAttrFormat** SAML
- static **SecAttrFormat** GACL

6.241.1 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.

6.241.2 Member Function Documentation

6.241.2.1 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** (p. 299).

6.241.2.2 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.

6.241.2.3 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 its implementation is not required yet.

6.241.2.4 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** (p. 299).

6.241.2.5 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.

6.241.2.6 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

6.242 Arc::SecAttrFormat Class Reference

Export/import format.

```
#include <SecAttr.h>
```

6.242.1 Detailed Description

Export/import format. Format is identified by textual identity string. Class description includes basic formats only. That list may be extended.

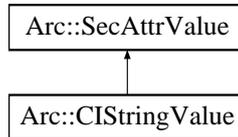
The documentation for this class was generated from the following file:

- SecAttr.h

6.243 Arc::SecAttrValue Class Reference

This is an abstract interface to a security attribute.

#include <SecAttrValue.h> Inheritance diagram for Arc::SecAttrValue::



Public Member Functions

- `bool operator==(SecAttrValue &b)`
- `bool operator!=(SecAttrValue &b)`
- `virtual operator bool ()`

6.243.1 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.

6.243.2 Member Function Documentation

6.243.2.1 `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::CIStrngValue` (p. 99).

6.243.2.2 `bool Arc::SecAttrValue::operator!=(SecAttrValue & b)`

This is a convenience function to allow the usage of "not equal" conditions and need not be overridden.

6.243.2.3 `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.

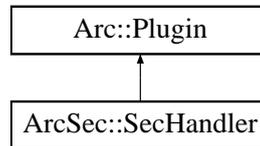
The documentation for this class was generated from the following file:

- `SecAttrValue.h`

6.244 ArcSec::SecHandler Class Reference

Base class for simple security handling plugins.

#include <SecHandler.h> Inheritance diagram for ArcSec::SecHandler::



6.244.1 Detailed Description

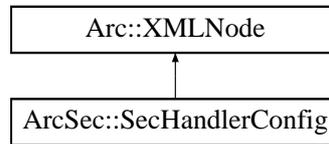
Base class for simple security handling plugins. This virtual class defines method Handle() which processes security related information/attributes in Message and optionally makes security decision. Instances of such classes are normally arranged in chains and are called on incoming and outgoing messages in various MCC and Service plugins. Return value of Handle() defines either processing should continue (true) or stop with error (false). Configuration of **SecHandler** (p. 399) 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

6.245 ArcSec::SecHandlerConfig Class Reference

#include <SecHandler.h> Inheritance diagram for ArcSec::SecHandlerConfig::



6.245.1 Detailed Description

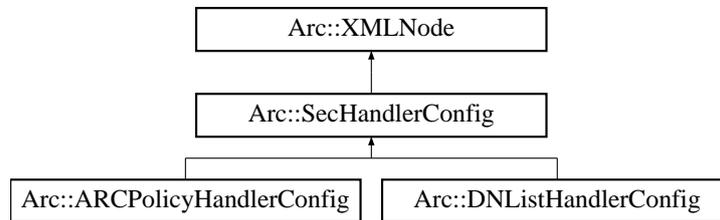
Helper class to create **Security** (p. 403) Handler configuration

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

- SecHandler.h

6.246 Arc::SecHandlerConfig Class Reference

Inheritance diagram for Arc::SecHandlerConfig::

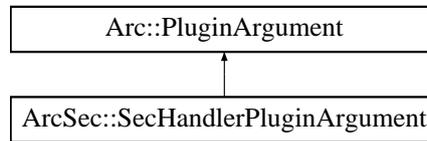


The documentation for this class was generated from the following file:

- ClientInterface.h

6.247 ArcSec::SecHandlerPluginArgument Class Reference

Inheritance diagram for ArcSec::SecHandlerPluginArgument::



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

- SecHandler.h

6.248 ArcSec::Security Class Reference

Common stuff used by security related classes.

```
#include <Security.h>
```

6.248.1 Detailed Description

Common stuff used by security related classes. This class is just a place where to put common stuff that is used by security related classes. So far it only contains a logger.

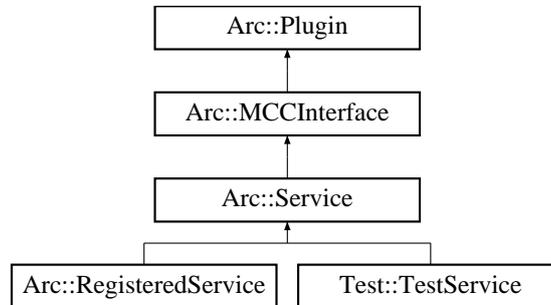
The documentation for this class was generated from the following file:

- Security.h

6.249 Arc::Service Class Reference

Service (p. 404) - last component in a **Message** (p. 286) Chain.

#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** ()

Protected Member Functions

- bool **ProcessSecHandlers** (**Message** &message, const std::string &label="")

Protected Attributes

- std::map< std::string, std::list< **ArcSec::SecHandler** * > > **sechandlers_**

Static Protected Attributes

- static **Logger** **logger**

6.249.1 Detailed Description

Service (p. 404) - last component in a **Message** (p. 286) Chain. This class which defines interface and common functionality for every **Service** (p. 404) plugin. Interface is made of method **process()** (p. 280) which is called by **Plexer** (p. 336) or **MCC** (p. 274) class. There is one **Service** (p. 404) object created for every service description processed by **Loader** (p. 263) class objects. Classes derived from **Service** (p. 404) class must implement **process()** (p. 280) method of **MCCInterface** (p. 280). It is up to developer how internal state of service is stored and communicated to other services and external utilites. **Service** (p. 404) 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 be linked to SOAP **MCC** (p. 274) it must accept and generate messages with **PayloadSOAP** (p. 319) payload. Method **process()** (p. 280) of class derived from **Service** (p. 404) 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`.

6.249.2 Constructor & Destructor Documentation

6.249.2.1 Arc::Service::Service (Config *)

Example constructor - Server takes at least it's configuration subtree

6.249.3 Member Function Documentation

6.249.3.1 virtual void Arc::Service::AddSecHandler (Config * *cfg*, ArcSec::SecHandler * *sechandler*, const std::string & *label* = "") [virtual]

Add security components/handlers to this MCC (p. 274). For more information please see description of `MCC::AddSecHandler` (p. 275)

6.249.3.2 virtual std::string Arc::Service::getID () [inline, virtual]

`Service` (p. 404) may implement own service identifier gathering method. This method return identifier of service which is used for registering it Information Services.

6.249.3.3 bool Arc::Service::ProcessSecHandlers (Message & *message*, const std::string & *label* = "") [protected]

Executes security handlers of specified queue. For more information please see description of `MCC::ProcessSecHandlers` (p. 275)

6.249.3.4 virtual bool Arc::Service::RegistrationCollector (XMLNode & *doc*) [virtual]

`Service` (p. 404) 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.

6.249.4 Field Documentation

6.249.4.1 Logger Arc::Service::logger [static, protected]

`Logger` (p. 265) object used to print messages generated by this class.

6.249.4.2 std::map<std::string, std::list<ArcSec::SecHandler*> > Arc::Service::sechandlers_ [protected]

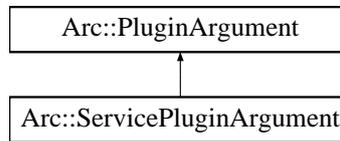
Set of labeled authentication and authorization handlers. `MCC` (p. 274) calls sequence of handlers at specific point depending on associated identifier. in most cases those are "in" and "out" for incoming and outgoing messages correspondingly.

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

- Service.h

6.250 Arc::ServicePluginArgument Class Reference

Inheritance diagram for Arc::ServicePluginArgument::



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

- Service.h

6.251 Arc::SimpleCondition Class Reference

Helper function to create simple thread.

```
#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)

6.251.1 Detailed Description

Helper function to create simple thread. It takes care of all peculiarities of Glib::Thread API. As result it runs function 'func' with argument 'arg' in a separate thread. The created thread will be joinable. Returns true on success. This function is currently disable because it is not clear if joinability is a needed feature Simple triggered condition. Provides condition and semaphor objects in one element.

6.251.2 Member Function Documentation

6.251.2.1 void Arc::SimpleCondition::broadcast (void) [inline]

Signal about condition to all waiting threads

6.251.2.2 void Arc::SimpleCondition::lock (void) [inline]

Acquire semaphor

6.251.2.3 void Arc::SimpleCondition::reset (void) [inline]

Reset object to initial state

6.251.2.4 void Arc::SimpleCondition::signal (void) [inline]

Signal about condition

6.251.2.5 void Arc::SimpleCondition::signal_nonblock (void) [inline]

Signal about condition without using semaphor

6.251.2.6 void Arc::SimpleCondition::unlock (void) [inline]

Release semaphor

6.251.2.7 bool Arc::SimpleCondition::wait (int *t*) [inline]

Wait for condition no longer than *t* milliseconds

6.251.2.8 void Arc::SimpleCondition::wait (void) [inline]

Wait for condition

6.251.2.9 void Arc::SimpleCondition::wait_nonblock (void) [inline]

Wait for condition without using semaphor

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

- Thread.h

6.252 Arc::SOAPMessage Class Reference

Message (p. 286) restricted to SOAP payload.

```
#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)

6.252.1 Detailed Description

Message (p. 286) restricted to SOAP payload. This is a special **Message** (p. 286) 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** (p. 286) but can carry only SOAP content.

6.252.2 Constructor & Destructor Documentation

6.252.2.1 Arc::SOAPMessage::SOAPMessage (void) [inline]

Dummy constructor

6.252.2.2 Arc::SOAPMessage::SOAPMessage (long msg_ptr_addr)

Copy constructor. Used by language bindings

6.252.2.3 Arc::SOAPMessage::SOAPMessage (Message & msg)

Copy constructor. Ensures shallow copy.

6.252.2.4 Arc::SOAPMessage::~~SOAPMessage (void)

Destructor does not affect referred objects

6.252.3 Member Function Documentation

6.252.3.1 MessageAttributes* Arc::SOAPMessage::Attributes (void) [inline]

Returns a pointer to the current attributes object or NULL if no attributes object has been assigned.

6.252.3.2 void Arc::SOAPMessage::Payload (SOAPEnvelope * *new_payload*)

Replace payload with a COPY of new one

6.252.3.3 SOAPEnvelope* Arc::SOAPMessage::Payload (void)

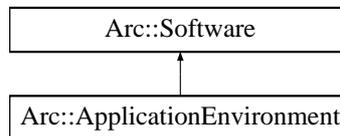
Returns pointer to current payload or NULL if no payload assigned.

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

- SOAPMessage.h

6.253 Arc::Software Class Reference

`#include <Software.h>`Inheritance diagram for Arc::Software::



Public Types

- enum **ComparisonOperator**

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)
- **Software** (const **Software** &sv)
- bool **empty** () const
- bool **operator==** (const **Software** &sv) const
- bool **operator!=** (const **Software** &sv) const
- std::string **operator**() () const

Static Public Attributes

- static const std::string **VERSIONTOKENS**

6.253.1 Detailed Description

The **Software** (p. 412) 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.). The basic usage of this class is to test if some specified software requirement are fulfilled, by using the comparability of the class.

6.253.2 Member Enumeration Documentation

6.253.2.1 enum Arc::Software::ComparisonOperator

The ComparisonOperator enumeration has a 1-1 correspondance between the defined comparison method operators, and can be used in situations where member function pointers are not supported.

6.253.3 Constructor & Destructor Documentation

6.253.3.1 Arc::Software::Software (const std::string & *name_version*)

Create a **Software** (p. 412) object from a single string composed of a name and a version part. The object will contain a empty family part. The name and version part of the string will be split at the first occurrence 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.

6.253.4 Member Function Documentation

6.253.4.1 bool Arc::Software::operator==(const Software & *sv*) const `[inline]`

Two **Software** (p. 412) objects are equal (returns true) if they are of the same family, and if they have the same name. If BOTH objects specifies a version they must also equal, for the objects to be equal. Otherwise the two objects does not equal (returns false).

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

- Software.h

6.254 Arc::SoftwareRequirement Class Reference

Public Member Functions

- void **add** (const **Software** &sw, SWComparisonOperator swComOp=&Software::operator==)
- void **setRequirement** (bool all)
- bool **isSatisfied** (const **Software** &svList) const
- const std::list< **Software** > & **getSoftwareList** () const
- const std::list< SWComparisonOperator > & **getComparisonOperatorList** () const

6.254.1 Member Function Documentation

6.254.1.1 void Arc::SoftwareRequirement::add (const Software & sw, SWComparisonOperator swComOp = &Software::operator==) [inline]

Adds software name and version to list of requirements and associates comparison operator with it (equality by default)

6.254.1.2 bool Arc::SoftwareRequirement::isSatisfied (const Software & svList) const [inline]

Returns true if stored requirements are satisfied by software specified in svList.

References isSatisfied().

Referenced by isSatisfied().

6.254.1.3 void Arc::SoftwareRequirement::setRequirement (bool all) [inline]

Specifies if all requirements stored need to be satisfied or if it is enough to satisfy only one.

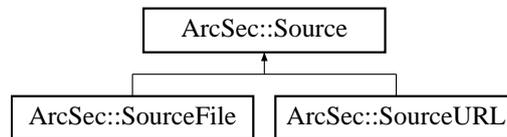
The documentation for this class was generated from the following file:

- Software.h

6.255 ArcSec::Source Class Reference

Acquires and parses XML document from specified source.

#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)

6.255.1 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.

6.255.2 Constructor & Destructor Documentation

6.255.2.1 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 create object should not exceed that of copied one.

6.255.2.2 ArcSec::Source::Source (Arc::URL & url)

Fetch XML document from specified url and parse it. This constructor is not implemented yet.

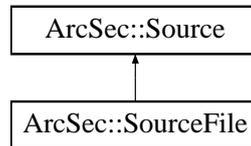
The documentation for this class was generated from the following file:

- Source.h

6.256 ArcSec::SourceFile Class Reference

Convenience class for obtaining XML document from file.

#include <Source.h> Inheritance diagram for ArcSec::SourceFile::



Public Member Functions

- **SourceFile** (const **SourceFile** &s)
- **SourceFile** (const char *name)
- **SourceFile** (const std::string &name)

6.256.1 Detailed Description

Convenience class for obtaining XML document from file.

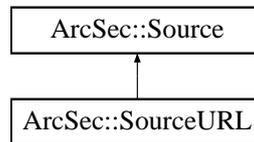
The documentation for this class was generated from the following file:

- Source.h

6.257 ArcSec::SourceURL Class Reference

Convenience class for obtaining XML document from remote URL.

#include <Source.h> Inheritance diagram for ArcSec::SourceURL::



Public Member Functions

- **SourceURL** (const **SourceURL** &s)
- **SourceURL** (const char *url)
- **SourceURL** (const std::string &url)

6.257.1 Detailed Description

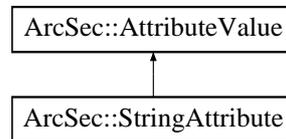
Convenience class for obtaining XML document from remote URL.

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

- Source.h

6.258 ArcSec::StringAttribute Class Reference

Inheritance diagram for ArcSec::StringAttribute::



Public Member Functions

- virtual std::string **encode** ()
- virtual std::string **getType** ()
- virtual std::string **getId** ()

6.258.1 Member Function Documentation

6.258.1.1 virtual std::string ArcSec::StringAttribute::encode () [inline, virtual]

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 78).

6.258.1.2 virtual std::string ArcSec::StringAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

6.258.1.3 virtual std::string ArcSec::StringAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

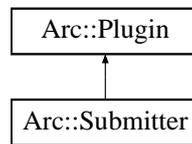
Implements **ArcSec::AttributeValue** (p. 78).

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

- StringAttribute.h

6.259 Arc::Submitter Class Reference

#include <Submitter.h>Inheritance diagram for Arc::Submitter::



6.259.1 Detailed Description

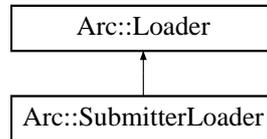
Base class for the Submitters Must be specialiced for each supported middleware flavour.

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

- Submitter.h

6.260 Arc::SubmitterLoader Class Reference

#include <Submitter.h>Inheritance diagram for Arc::SubmitterLoader::



Public Member Functions

- **SubmitterLoader** ()
- **~SubmitterLoader** ()
- **Submitter * load** (const std::string &name, const **Config** &cfg, const **UserConfig** &usercfg)
- const std::list< **Submitter** * > & **GetSubmitters** () const

6.260.1 Detailed Description

Class responsible for loading **Submitter** (p. 419) plugins The **Submitter** (p. 419) objects returned by a **SubmitterLoader** (p. 420) must not be used after the **SubmitterLoader** (p. 420) goes out of scope.

6.260.2 Constructor & Destructor Documentation

6.260.2.1 Arc::SubmitterLoader::SubmitterLoader ()

Constructor Creates a new **SubmitterLoader** (p. 420).

6.260.2.2 Arc::SubmitterLoader::~~SubmitterLoader ()

Destructor Calling the destructor destroys all Submitters loaded by the **SubmitterLoader** (p. 420) instance.

6.260.3 Member Function Documentation

6.260.3.1 const std::list<Submitter*> & Arc::SubmitterLoader::GetSubmitters () const [inline]

Retrieve the list of loaded Submitters.

Returns:

A reference to the list of Submitters.

6.260.3.2 Submitter* Arc::SubmitterLoader::load (const std::string & name, const Config & cfg, const UserConfig & usercfg)

Load a new **Submitter** (p. 419)

Parameters:

name The name of the **Submitter** (p. 419) to load.

cfg The **Config** (p. 113) object for the new **Submitter** (p. 419).

usercfg The **UserConfig** (p. 447) object for the new **Submitter** (p. 419).

Returns:

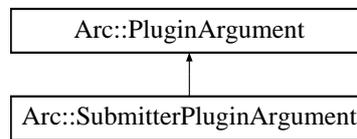
A pointer to the new **Submitter** (p. 419) (NULL on error).

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

- Submitter.h

6.261 Arc::SubmitterPluginArgument Class Reference

Inheritance diagram for Arc::SubmitterPluginArgument::



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

- Submitter.h

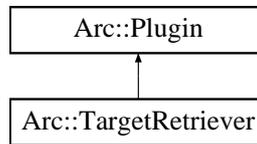
6.262 Arc::TargetGenerator Class Reference

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

- TargetGenerator.h

6.263 Arc::TargetRetriever Class Reference

#include <TargetRetriever.h> Inheritance diagram for Arc::TargetRetriever::



6.263.1 Detailed Description

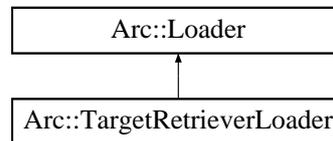
Base class for the TargetRetrievers Must be specialiced for each supported middleware flavour.

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

- TargetRetriever.h

6.264 Arc::TargetRetrieverLoader Class Reference

#include <TargetRetriever.h> Inheritance diagram for Arc::TargetRetrieverLoader:



Public Member Functions

- **TargetRetrieverLoader** ()
- **~TargetRetrieverLoader** ()
- **TargetRetriever * load** (const std::string &name, const **Config** &cfg, const **UserConfig** &usercfg)
- const std::list< **TargetRetriever * > & GetTargetRetrievers** () const

6.264.1 Detailed Description

Class responsible for loading **TargetRetriever** (p. 424) plugins The **TargetRetriever** (p. 424) objects returned by a **TargetRetrieverLoader** (p. 425) must not be used after the **TargetRetrieverLoader** (p. 425) goes out of scope.

6.264.2 Constructor & Destructor Documentation

6.264.2.1 Arc::TargetRetrieverLoader::TargetRetrieverLoader ()

Constructor Creates a new **TargetRetrieverLoader** (p. 425).

6.264.2.2 Arc::TargetRetrieverLoader::~~TargetRetrieverLoader ()

Destructor Calling the destructor destroys all **TargetRetrievers** loaded by the **TargetRetrieverLoader** (p. 425) instance.

6.264.3 Member Function Documentation

6.264.3.1 const std::list<TargetRetriever*>& Arc::TargetRetrieverLoader::GetTargetRetrievers () const [inline]

Retrieve the list of loaded **TargetRetrievers**.

Returns:

A reference to the list of **TargetRetrievers**.

6.264.3.2 **TargetRetriever*** Arc::TargetRetrieverLoader::load (const std::string & *name*, const Config & *cfg*, const UserConfig & *usercfg*)

Load a new **TargetRetriever** (p. 424)

Parameters:

name The name of the **TargetRetriever** (p. 424) to load.

cfg The **Config** (p. 113) object for the new **TargetRetriever** (p. 424).

usercfg The **UserConfig** (p. 447) object for the new **TargetRetriever** (p. 424).

Returns:

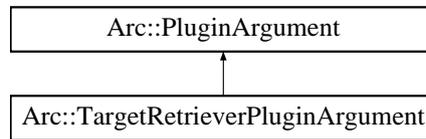
A pointer to the new **TargetRetriever** (p. 424) (NULL on error).

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

- TargetRetriever.h

6.265 Arc::TargetRetrieverPluginArgument Class Reference

Inheritance diagram for Arc::TargetRetrieverPluginArgument::

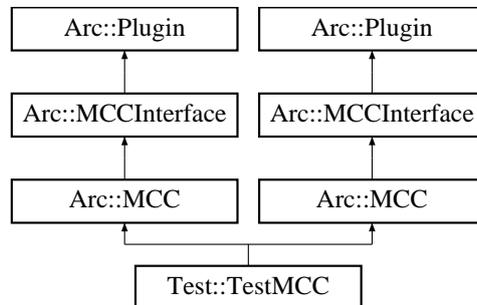


The documentation for this class was generated from the following file:

- TargetRetriever.h

6.266 Test::TestMCC Class Reference

Inheritance diagram for Test::TestMCC::

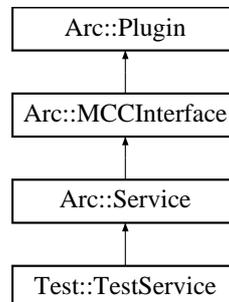


The documentation for this class was generated from the following files:

- loader/TestMCC.h
- message/TestMCC.h

6.267 Test::TestService Class Reference

Inheritance diagram for Test::TestService::



Public Member Functions

- virtual **Arc::MCC_Status** **process** (**Arc::Message** &request, **Arc::Message** &response)

6.267.1 Member Function Documentation

6.267.1.1 virtual **Arc::MCC_Status** **Test::TestService::process** (**Arc::Message** & *request*, **Arc::Message** & *response*) [**virtual**]

Method for processing of requests and responses. This method is called by preceding 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.

Implements **Arc::MCCInterface** (p. 280).

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

- TestService.h

6.268 Arc::ThreadInitializer Class Reference

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

- Thread.h

6.269 Arc::Time Class Reference

A class for storing and manipulating times.

```
#include <DateTime.h>
```

Public Member Functions

- **Time** ()
- **Time** (const time_t &)
- **Time** (const std::string &)
- **Time** & **operator=** (const time_t &)
- **Time** & **operator=** (const **Time** &)
- **Time** & **operator=** (const char *)
- **Time** & **operator=** (const std::string &)
- void **SetTime** (const time_t &)
- 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** ()

6.269.1 Detailed Description

A class for storing and manipulating times.

6.269.2 Constructor & Destructor Documentation

6.269.2.1 Arc::Time::Time ()

Default constructor. The time is put equal the current time.

6.269.2.2 Arc::Time::Time (const time_t &)

Constructor that takes a time_t variable and stores it.

6.269.2.3 `Arc::Time::Time (const std::string &)`

Constructor that tries to convert a string into a `time_t`.

6.269.3 Member Function Documentation

6.269.3.1 `static TimeFormat Arc::Time::GetFormat () [static]`

Gets the default format for time strings.

6.269.3.2 `time_t Arc::Time::GetTime () const`

gets the time

6.269.3.3 `Arc::Time::operator std::string () const`

Returns a string representation of the time, using the default format.

6.269.3.4 `bool Arc::Time::operator!= (const Time &) const`

Comparing two `Time` (p. 431) objects.

6.269.3.5 `Time Arc::Time::operator+ (const Period &) const`

Adding `Time` (p. 431) object with `Period` (p. 331) object.

6.269.3.6 `Period Arc::Time::operator- (const Time &) const`

Subtracting `Time` (p. 431) object from the other `Time` (p. 431) object.

6.269.3.7 `Time Arc::Time::operator- (const Period &) const`

Subtracting `Period` (p. 331) object from `Time` (p. 431) object.

6.269.3.8 `bool Arc::Time::operator< (const Time &) const`

Comparing two `Time` (p. 431) objects.

6.269.3.9 `bool Arc::Time::operator<= (const Time &) const`

Comparing two `Time` (p. 431) objects.

6.269.3.10 `Time& Arc::Time::operator= (const std::string &)`

Assignment operator from a string.

6.269.3.11 Time& Arc::Time::operator= (const char *)

Assignment operator from a char pointer.

6.269.3.12 Time& Arc::Time::operator= (const Time &)

Assignment operator from a **Time** (p. 431).

6.269.3.13 Time& Arc::Time::operator= (const time_t &)

Assignment operator from a time_t.

6.269.3.14 bool Arc::Time::operator== (const Time &) const

Comparing two **Time** (p. 431) objects.

6.269.3.15 bool Arc::Time::operator> (const Time &) const

Comparing two **Time** (p. 431) objects.

6.269.3.16 bool Arc::Time::operator>= (const Time &) const

Comparing two **Time** (p. 431) objects.

6.269.3.17 static void Arc::Time::SetFormat (const TimeFormat &) [static]

Sets the default format for time strings.

6.269.3.18 void Arc::Time::SetTime (const time_t &)

sets the time

6.269.3.19 std::string Arc::Time::str (const TimeFormat & = time_format) const

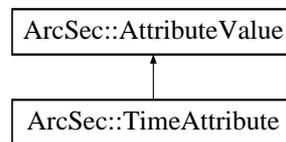
Returns a string representation of the time, using the specified format.

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

- DateTime.h

6.270 ArcSec::TimeAttribute Class Reference

#include <DateTimeAttribute.h> Inheritance diagram for ArcSec::TimeAttribute::



Public Member Functions

- virtual std::string **encode** ()
- virtual std::string **getType** ()
- virtual std::string **getId** ()

6.270.1 Detailed Description

Format: HHMMSSZ HH:MM:SS HH:MM:SS+HH:MM HH:MM:SSZ

6.270.2 Member Function Documentation

6.270.2.1 virtual std::string ArcSec::TimeAttribute::encode () [virtual]

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 78).

6.270.2.2 virtual std::string ArcSec::TimeAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

6.270.2.3 virtual std::string ArcSec::TimeAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

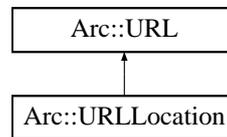
Implements **ArcSec::AttributeValue** (p. 78).

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

- DateTimeAttribute.h

6.271 Arc::URL Class Reference

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)
- 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
- void **ChangePath** (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
- 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
- void **AddOption** (const std::string &option, const std::string &value, bool overwrite=true)
- 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
- virtual std::string **str** () 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
- 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)

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**
- int **port**
- std::string **path**
- std::map< std::string, std::string > **htpoptions**
- std::map< std::string, std::string > **metadataoptions**
- std::list< std::string > **ldattributes**
- **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)

6.271.1 Member Enumeration Documentation

6.271.1.1 enum Arc::URL::Scope

Scope for LDAP URLs

6.271.2 Constructor & Destructor Documentation

6.271.2.1 Arc::URL::URL ()

Empty constructor. Necessary when the class is part of another class and the like.

6.271.2.2 Arc::URL::URL (const std::string & url)

Constructs a new **URL** (p. 435) from a string representation.

6.271.2.3 virtual Arc::URL::~~URL () [virtual]

URL (p. 435) Destructor

6.271.3 Member Function Documentation**6.271.3.1 void Arc::URL::AddLDAPAttribute (const std::string & attribute)**

Adds an LDAP attribute.

6.271.3.2 void Arc::URL::AddOption (const std::string & option, const std::string & value, bool overwrite = true)

Adds a **URL** (p. 435) option.

6.271.3.3 static std::string Arc::URL::BaseDN2Path (const std::string &) [static, protected]

a private method that converts an ldap basedn to a path.

6.271.3.4 void Arc::URL::ChangeHost (const std::string & newhost)

Changes the hostname of the **URL** (p. 435).

6.271.3.5 void Arc::URL::ChangeLDAPFilter (const std::string & newfilter)

Changes the LDAP filter.

6.271.3.6 void Arc::URL::ChangeLDAPScope (const Scope newscope)

Changes the LDAP scope.

6.271.3.7 void Arc::URL::ChangePath (const std::string & newpath)

Changes the path of the **URL** (p. 435).

6.271.3.8 void Arc::URL::ChangePort (int newport)

Changes the port of the **URL** (p. 435).

6.271.3.9 void Arc::URL::ChangeProtocol (const std::string & newprot)

Changes the protocol of the **URL** (p. 435).

6.271.3.10 `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.

6.271.3.11 `const std::map<std::string, std::string>& Arc::URL::CommonLocOptions () const`

Returns the common location options if any.

6.271.3.12 `virtual std::string Arc::URL::ConnectionURL () const [virtual]`

Returns a string representation with protocol, host and port only

6.271.3.13 `std::string Arc::URL::FullPath () const`

Returns the path of the [URL](#) (p. 435) with all options attached.

6.271.3.14 `virtual std::string Arc::URL::fullstr () const [virtual]`

Returns a string representation including options and locations

Reimplemented in [Arc::URLLocation](#) (p. 444).

6.271.3.15 `const std::string& Arc::URL::Host () const`

Returns the hostname of the [URL](#) (p. 435).

6.271.3.16 `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.

6.271.3.17 `const std::map<std::string, std::string> & Arc::URL::HTTPOptions () const`

Returns HTTP options if any.

6.271.3.18 `const std::list<std::string> & Arc::URL::LDAPAttributes () const`

Returns the LDAP attributes if any.

6.271.3.19 `const std::string& Arc::URL::LDAPFilter () const`

Returns the LDAP filter.

6.271.3.20 `Scope Arc::URL::LDAPScope () const`

Returns the LDAP scope.

6.271.3.21 `const std::list<URLLocation>& Arc::URL::Locations () const`

Returns the locations if any.

6.271.3.22 `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.

6.271.3.23 `const std::map<std::string, std::string>& Arc::URL::MetaDataOptions () const`

Returns metadata options if any.

6.271.3.24 `Arc::URL::operator bool () const`

Check if instance holds valid **URL** (p. 435)

6.271.3.25 `bool Arc::URL::operator< (const URL & url) const`

Compares one **URL** (p. 435) to another

6.271.3.26 `bool Arc::URL::operator== (const URL & url) const`

Is one **URL** (p. 435) equal to another?

6.271.3.27 `const std::string& Arc::URL::Option (const std::string & option, const std::string & undefined = "") const`

Returns the value of a **URL** (p. 435) option.

Parameters:

option The option whose value is returned.

undefined This value is returned if the **URL** (p. 435) option is not defined.

6.271.3.28 `const std::map<std::string, std::string>& Arc::URL::Options () const`

Returns **URL** (p. 435) options if any.

6.271.3.29 `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

6.271.3.30 `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

6.271.3.31 `const std::string& Arc::URL::Passwd () const`

Returns the password of the **URL** (p. 435).

6.271.3.32 `const std::string& Arc::URL::Path () const`

Returns the path of the **URL** (p. 435).

6.271.3.33 `static std::string Arc::URL::Path2BaseDN (const std::string &) [static, protected]`

a private method that converts an ldap path to a basedn.

6.271.3.34 `int Arc::URL::Port () const`

Returns the port of the **URL** (p. 435).

6.271.3.35 `const std::string& Arc::URL::Protocol () const`

Returns the protocol of the **URL** (p. 435).

6.271.3.36 `virtual std::string Arc::URL::str () const [virtual]`

Returns a string representation of the **URL** (p. 435).

Reimplemented in **Arc::URLLocation** (p. 444).

6.271.3.37 `const std::string& Arc::URL::Username () const`

Returns the username of the **URL** (p. 435).

6.271.4 Friends And Related Function Documentation

6.271.4.1 `std::ostream& operator<< (std::ostream & out, const URL & u) [friend]`

Overloaded operator << to print a URL (p. 435).

6.271.5 Field Documentation

6.271.5.1 `std::map<std::string, std::string> Arc::URL::commonlocoptions [protected]`

common location options for index server URLs.

6.271.5.2 `std::string Arc::URL::host [protected]`

hostname of the url.

6.271.5.3 `std::map<std::string, std::string> Arc::URL::httpoptions [protected]`

HTTP options of the url.

6.271.5.4 `std::list<std::string> Arc::URL::ldapattributes [protected]`

LDAP attributes of the url.

6.271.5.5 `std::string Arc::URL::ldapfilter [protected]`

LDAP filter of the url.

6.271.5.6 `Scope Arc::URL::ldapscope [protected]`

LDAP scope of the url.

6.271.5.7 `std::list<URLLocation> Arc::URL::locations [protected]`

locations for index server URLs.

6.271.5.8 `std::map<std::string, std::string> Arc::URL::metadataoptions [protected]`

Meta data options

6.271.5.9 `std::string Arc::URL::passwd [protected]`

password of the url.

6.271.5.10 `std::string Arc::URL::path [protected]`

the url path.

6.271.5.11 int Arc::URL::port [protected]

portnumber of the url.

6.271.5.12 std::string Arc::URL::protocol [protected]

the url protocol.

6.271.5.13 std::map<std::string, std::string> Arc::URL::urloptions [protected]

options of the url.

6.271.5.14 std::string Arc::URL::username [protected]

username of the url.

6.271.5.15 bool Arc::URL::valid [protected]

flag to describe validity of **URL** (p. 435)

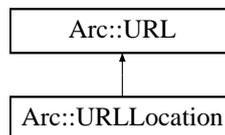
The documentation for this class was generated from the following file:

- **URL.h**

6.272 Arc::URLLocation Class Reference

Class to hold a resolved **URL** (p. 435) location.

#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**

6.272.1 Detailed Description

Class to hold a resolved **URL** (p. 435) location. It is specific to file indexing service registrations.

6.272.2 Constructor & Destructor Documentation

6.272.2.1 Arc::URLLocation::URLLocation (const std::string & url)

Creates a **URLLocation** (p. 443) from a string representaion.

6.272.2.2 Arc::URLLocation::URLLocation (const std::string & url, const std::string & name)

Creates a **URLLocation** (p. 443) from a string representaion and a name.

6.272.2.3 Arc::URLLocation::URLLocation (const **URL** & url)

Creates a **URLLocation** (p. 443) from a **URL** (p. 435).

6.272.2.4 Arc::URLLocation::URLLocation (const URL & url, const std::string & name)

Creates a **URLLocation** (p. 443) from a **URL** (p. 435) and a name.

6.272.2.5 Arc::URLLocation::URLLocation (const std::map< std::string, std::string > & options, const std::string & name)

Creates a **URLLocation** (p. 443) from options and a name.

6.272.2.6 virtual Arc::URLLocation::~~URLLocation () [virtual]

URLLocation (p. 443) destructor.

6.272.3 Member Function Documentation**6.272.3.1 virtual std::string Arc::URLLocation::fullstr () const [virtual]**

Returns a string representation including options and locations

Reimplemented from **Arc::URL** (p. 438).

6.272.3.2 const std::string& Arc::URLLocation::Name () const

Returns the **URLLocation** (p. 443) name.

6.272.3.3 virtual std::string Arc::URLLocation::str () const [virtual]

Returns a string representation of the **URLLocation** (p. 443).

Reimplemented from **Arc::URL** (p. 440).

6.272.4 Field Documentation**6.272.4.1 std::string Arc::URLLocation::name [protected]**

the **URLLocation** (p. 443) name as registered in the indexing service.

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

- **URL.h**

6.273 Arc::URLMap Class Reference

Data Structures

- class `map_entry`

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

- `URLMap.h`

6.274 Arc::User Class Reference

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

- User.h

6.275 Arc::UserConfig Class Reference

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

- UserConfig.h

6.276 Arc::UsernameToken Class Reference

Interface for manipulation of WS-Security according to Username Token **Profile** (p. 353).

```
#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)

6.276.1 Detailed Description

Interface for manipulation of WS-Security according to Username Token **Profile** (p. 353).

6.276.2 Member Enumeration Documentation

6.276.2.1 enum Arc::UsernameToken::PasswordType

SOAP header element

6.276.3 Constructor & Destructor Documentation

6.276.3.1 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.

6.276.3.2 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 (p. 448) wsu:ID="...">
pwdtype <wsse:Password Type="...">...</wsse:Password>

6.276.3.3 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** (p. 286) Authentication Code
iteration <wsse11:Iteration>...</wsse11:Iteration>

6.276.4 Member Function Documentation

6.276.4.1 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

6.276.4.2 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** (p. 448) class using obtained derived_key.

6.276.4.3 Arc::UsernameToken::operator bool (void)

Returns true of constructor succeeded

6.276.4.4 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

6.277 Arc::UserSwitch Class Reference

```
#include <User.h>
```

6.277.1 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 environment. Other purpose of this lock is to provide workaround for glibc bug in `__nptl_setuid`. That bug causes lockup of `seteuid()` function if racing with `fork`. To avoid this problem the lock mentioned above is used by **Run** (p. 384) class while spawning new process.

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

- User.h

6.278 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 > ®exs)
- VOMSTrustChain & **AddChain** (const VOMSTrustChain &chain)
- VOMSTrustChain & **AddChain** (void)
- **RegularExpression** & **AddRegex** (const VOMSTrustRegex ®)

6.278.1 Detailed Description

Stores definitions for making decision if VOMS server is trusted

6.278.2 Constructor & Destructor Documentation

6.278.2.1 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:VOMSCertTrustDNChain> <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>----NEXT CHAIN--- </tls:VOMSCertTrustDN> <tls:VOMSCertTrustDN>/DC=ch/DC=cern/OU=computers/CN=voms.cern.ch</tls:VOMSCertTrustDN> <tls:VOMSCertTrustDN>/DC=ch/DC=cern/CN=CERN Trusted Certification Authority</tls:VOMSCertTrustDN> </tls:VOMSCertTrustDNChain> the other way is: <tls:VOMSCertTrustDNChain> <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:VOMSCertTrustDNChain> <tls:VOMSCertTrustDNChain> <tls:VOMSCertTrustDN>/DC=ch/DC=cern/OU=computers/CN=voms.cern.ch</tls:VOMSCertTrustDN> <tls:VOMSCertTrustDN>/DC=ch/DC=cern/CN=CERN Trusted Certification Authority</tls:VOMSCertTrustDN> </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) .

6.278.2.2 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()** (p.452) and **AddRegex()** (p. 452) for more information.

6.278.3 Member Function Documentation

6.278.3.1 VOMSTrustChain& Arc::VOMSTrustList::AddChain (void)

Adds empty chain of trusted DNs to list.

6.278.3.2 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.

6.278.3.3 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

6.279 Arc::WSAEndpointReference Class Reference

Interface for manipulation of WS-Addressing Endpoint Reference.

```
#include <WSA.h>
```

Public Member Functions

- **WSAEndpointReference** (const **XMLNode** &epr)
- **WSAEndpointReference** (const **WSAEndpointReference** &wsa)
- **WSAEndpointReference** (const std::string &address)
- **WSAEndpointReference** (void)
- **~WSAEndpointReference** (void)
- std::string **Address** (void) const
- void **Address** (const std::string &uri)
- **WSAEndpointReference** & **operator=** (const std::string &address)
- **XMLNode ReferenceParameters** (void)
- **XMLNode MetaData** (void)
- **operator XMLNode** (void)

6.279.1 Detailed Description

Interface for manipulation of WS-Addressing Endpoint Reference. It works on Endpoint Reference stored in XML tree. No information is stored in this object except reference to corresponding XML subtree.

6.279.2 Constructor & Destructor Documentation

6.279.2.1 Arc::WSAEndpointReference::WSAEndpointReference (const XMLNode & epr)

Link to top level EPR XML node Linking to existing EPR in XML tree

6.279.2.2 Arc::WSAEndpointReference::WSAEndpointReference (const WSAEndpointReference & wsa)

Copy constructor

6.279.2.3 Arc::WSAEndpointReference::WSAEndpointReference (const std::string & address)

Creating independent EPR - not implemented

6.279.2.4 Arc::WSAEndpointReference::WSAEndpointReference (void)

Dummy constructor - creates invalid instance

6.279.2.5 Arc::WSAEndpointReference::~~WSAEndpointReference (void)

Destructor. All empty elements of EPR XML are destroyed here too

6.279.3 Member Function Documentation

6.279.3.1 void Arc::WSAEndpointReference::Address (const std::string & uri)

Assigns new Address value. If EPR had no Address element it is created.

6.279.3.2 std::string Arc::WSAEndpointReference::Address (void) const

Returns Address (URL (p. 435)) encoded in EPR

6.279.3.3 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.

6.279.3.4 Arc::WSAEndpointReference::operator XMLNode (void)

Returns reference to EPR top XML node

6.279.3.5 WSAEndpointReference& Arc::WSAEndpointReference::operator= (const std::string & address)

Same as Address(uri)

6.279.3.6 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

6.280 Arc::WSAHeader Class Reference

Interface for manipulation WS-Addressing information in SOAP header.

```
#include <WSA.h>
```

Public Member Functions

- **WSAHeader** (SOAPEnvelope &soap)
- **WSAHeader** (const std::string &action)
- std::string **To** (void) const
- void **To** (const std::string &uri)
- **WSAEndpointReference From** (void)
- **WSAEndpointReference ReplyTo** (void)
- **WSAEndpointReference FaultTo** (void)
- std::string **Action** (void) const
- void **Action** (const std::string &uri)
- std::string **MessageID** (void) const
- void **MessageID** (const std::string &uri)
- std::string **RelatesTo** (void) const
- void **RelatesTo** (const std::string &uri)
- std::string **RelationshipType** (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_**

6.280.1 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.

6.280.2 Constructor & Destructor Documentation

6.280.2.1 Arc::WSAHeader::WSAHeader (SOAPEnvelope & soap)

Linking to a header of existing SOAP message

6.280.2.2 Arc::WSAHeader::WSAHeader (const std::string & action)

Creating independent SOAP header - not implemented

6.280.3 Member Function Documentation**6.280.3.1 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.

6.280.3.2 std::string Arc::WSAHeader::Action (void) const

Returns content of Action element of SOAP Header.

6.280.3.3 static bool Arc::WSAHeader::Check (SOAPEnvelope & soap) [static]

Tells if specified SOAP message has WSA header

6.280.3.4 WSAEndpointReference Arc::WSAHeader::FaultTo (void)

Returns FaultTo element of SOAP Header. If such element does not exist it's created. Obtained element may be manipulated.

6.280.3.5 WSAEndpointReference Arc::WSAHeader::From (void)

Returns From element of SOAP Header. If such element does not exist it's created. Obtained element may be manipulated.

6.280.3.6 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.

6.280.3.7 std::string Arc::WSAHeader::MessageID (void) const

Returns content of MessageID element of SOAP Header.

6.280.3.8 XMLNode Arc::WSAHeader::NewReferenceParameter (const std::string & name)

Creates new ReferenceParameter element with specified name. Returns reference to created element.

6.280.3.9 Arc::WSAHeader::operator XMLNode (void)

Returns reference to SOAP Header - not implemented

6.280.3.10 XMLNode Arc::WSAHeader::ReferenceParameter (const std::string & name)

Returns first ReferenceParameter element with specified name

6.280.3.11 XMLNode Arc::WSAHeader::ReferenceParameter (int *n*)

Return n-th ReferenceParameter element

6.280.3.12 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.

6.280.3.13 std::string Arc::WSAHeader::RelatesTo (void) const

Returns content of RelatesTo element of SOAP Header.

6.280.3.14 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.

6.280.3.15 std::string Arc::WSAHeader::RelationshipType (void) const

Returns content of RelationshipType element of SOAP Header.

6.280.3.16 WSAEndpointReference Arc::WSAHeader::ReplyTo (void)

Returns ReplyTo element of SOAP Header. If such element does not exist it's created. Obtained element may be manipulated.

6.280.3.17 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.

6.280.3.18 std::string Arc::WSAHeader::To (void) const

Returns content of To element of SOAP Header.

6.280.4 Field Documentation**6.280.4.1 bool Arc::WSAHeader::header_allocated_ [protected]**

SOAP header element

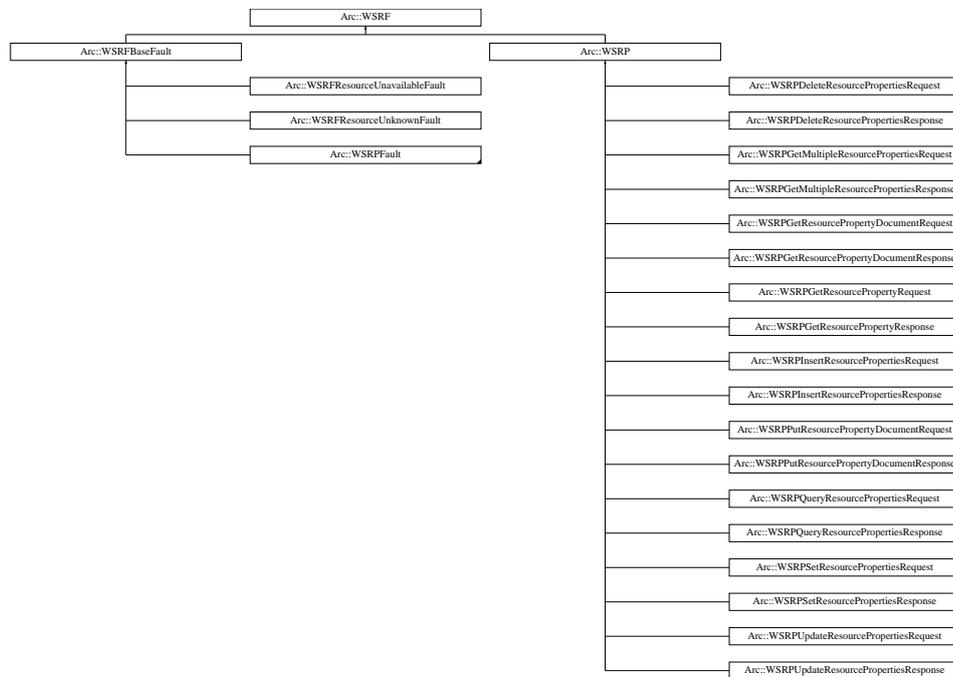
The documentation for this class was generated from the following file:

- WSA.h

6.281 Arc::WSRF Class Reference

Base class for every **WSRF** (p. 458) message.

#include <WSRF.h> Inheritance diagram for Arc::WSRF::



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_**

6.281.1 Detailed Description

Base class for every **WSRF** (p. 458) message. This class is not intended to be used directly. Use it like reference while passing through unknown **WSRF** (p. 458) message or use classes derived from it.

6.281.2 Constructor & Destructor Documentation

6.281.2.1 Arc::WSRF::WSRF (SOAPEnvelope & soap, const std::string & action = "")

Constructor - creates object out of supplied SOAP tree.

6.281.2.2 Arc::WSRF::WSRF (bool fault = false, const std::string & action = "")

Constructor - creates new WSRF (p. 458) object

6.281.3 Member Function Documentation

6.281.3.1 virtual Arc::WSRF::operator bool (void) [inline, virtual]

Returns true if instance is valid

References valid_.

6.281.3.2 void Arc::WSRF::set_namespaces (void) [protected]

true if object represents valid WSRF (p. 458) message set WS Resource namespaces and default prefixes in SOAP message

Reimplemented in Arc::WSRP (p. 464), and Arc::WSRFBaseFault (p. 460).

6.281.3.3 virtual SOAPEnvelope& Arc::WSRF::SOAP (void) [inline, virtual]

Direct access to underlying SOAP element

6.281.4 Field Documentation

6.281.4.1 bool Arc::WSRF::allocated_ [protected]

Associated SOAP message - it's SOAP message after all

6.281.4.2 bool Arc::WSRF::valid_ [protected]

true if soap_ needs to be deleted in destructor

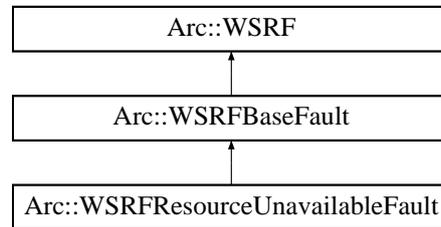
Referenced by operator bool().

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

- WSRF.h

6.283 Arc::WSRFResourceUnavailableFault Class Reference

Inheritance diagram for Arc::WSRFResourceUnavailableFault::

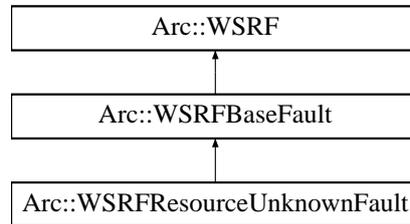


The documentation for this class was generated from the following file:

- WSRFBaseFault.h

6.284 Arc::WSRFResourceUnknownFault Class Reference

Inheritance diagram for Arc::WSRFResourceUnknownFault::



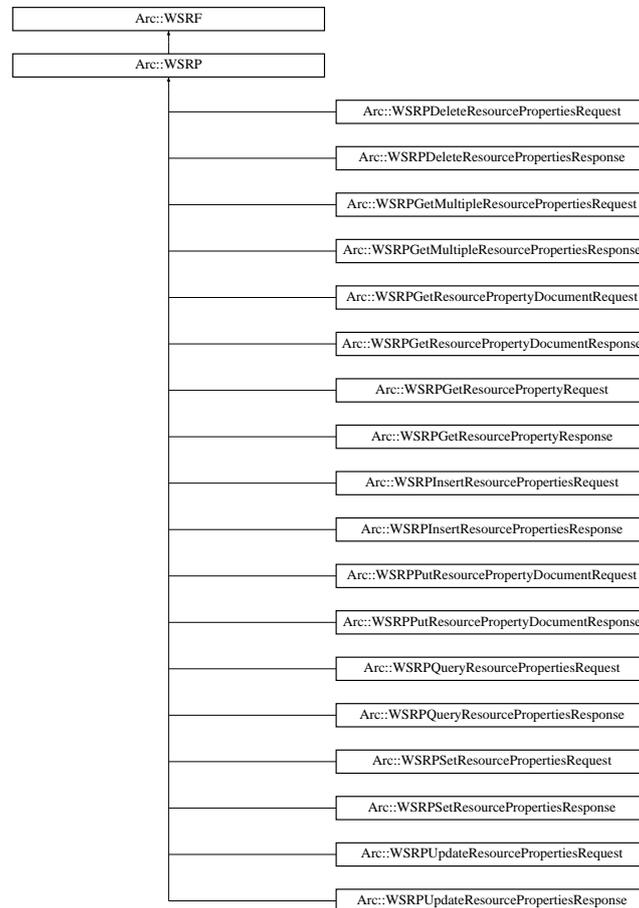
The documentation for this class was generated from the following file:

- WSRFBaseFault.h

6.285 Arc::WSRP Class Reference

Base class for WS-ResourceProperties structures.

#include <WSResourceProperties.h> Inheritance diagram for Arc::WSRP::



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)

6.285.1 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.

6.285.2 Constructor & Destructor Documentation

6.285.2.1 `Arc::WSRP::WSRP (bool fault = false, const std::string & action = "")`

Constructor - prepares object for creation of new **WSRP** (p. 463) request/response/fault

6.285.2.2 `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.

6.285.3 Member Function Documentation

6.285.3.1 `void Arc::WSRP::set_namespaces (void) [protected]`

set WS-ResourceProperties namespaces and default prefixes in SOAP message

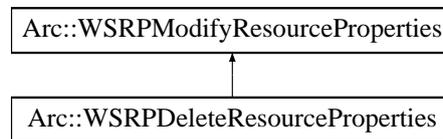
Reimplemented from **Arc::WSRF** (p. 459).

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

- WSResourceProperties.h

6.286 Arc::WSRPDeleteResourceProperties Class Reference

Inheritance diagram for Arc::WSRPDeleteResourceProperties::

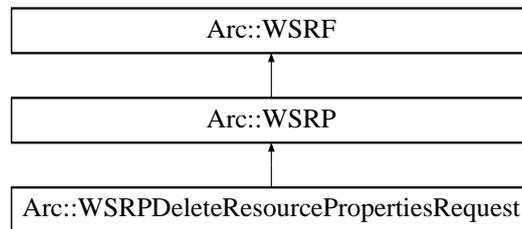


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.287 Arc::WSRPDeleteResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPDeleteResourcePropertiesRequest::

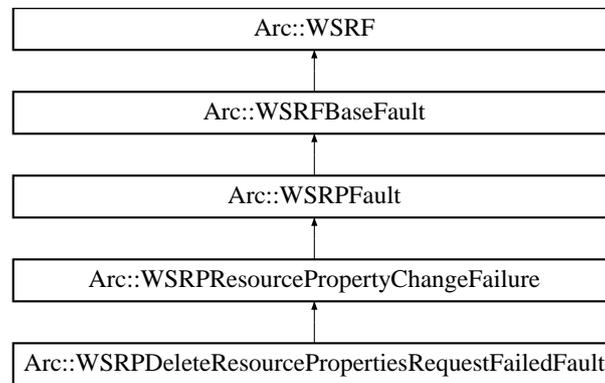


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.288 Arc::WSRPDeleteResourcePropertiesRequestFailedFault Class Reference

Inheritance diagram for Arc::WSRPDeleteResourcePropertiesRequestFailedFault::

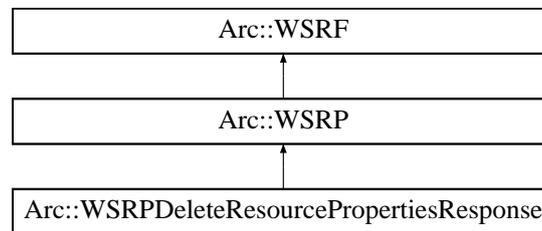


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.289 Arc::WSRPDeleteResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPDeleteResourcePropertiesResponse::



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

- WSResourceProperties.h

6.290 Arc::WSRPFault Class Reference

Base class for WS-ResourceProperties faults.

#include <WSResourceProperties.h> Inheritance diagram for Arc::WSRPFault::



Public Member Functions

- **WSRPFault** (SOAPEnvelope &soap)
- **WSRPFault** (const std::string &type)

6.290.1 Detailed Description

Base class for WS-ResourceProperties faults.

6.290.2 Constructor & Destructor Documentation

6.290.2.1 Arc::WSRPFault::WSRPFault (SOAPEnvelope & soap)

Constructor - creates object out of supplied SOAP tree.

6.290.2.2 Arc::WSRPFault::WSRPFault (const std::string & type)

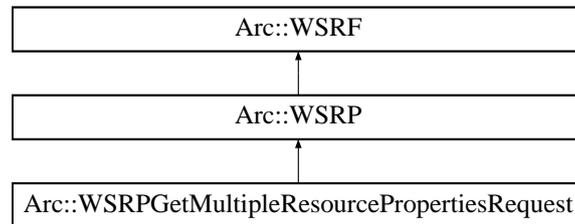
Constructor - creates new **WSRP** (p. 463) fault

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

- WSResourceProperties.h

6.291 Arc::WSRPGetMultipleResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPGetMultipleResourcePropertiesRequest::

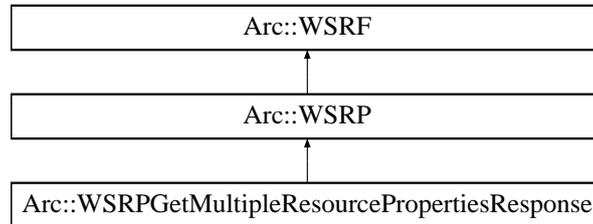


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.292 Arc::WSRPGetMultipleResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPGetMultipleResourcePropertiesResponse::

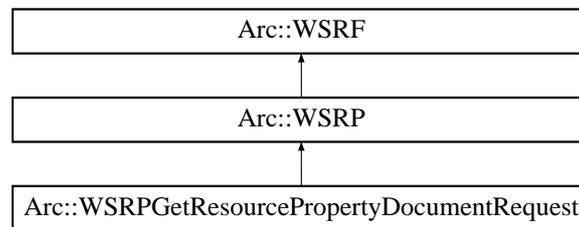


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.293 Arc::WSRPGetResourcePropertyDocumentRequest Class Reference

Inheritance diagram for Arc::WSRPGetResourcePropertyDocumentRequest::

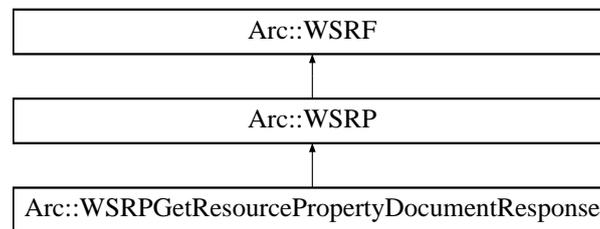


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.294 Arc::WSRPGetResourcePropertyDocumentResponse Class Reference

Inheritance diagram for Arc::WSRPGetResourcePropertyDocumentResponse::

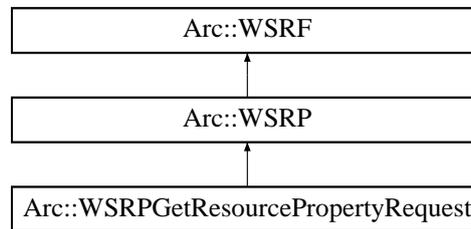


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.295 Arc::WSRPGetResourcePropertyRequest Class Reference

Inheritance diagram for Arc::WSRPGetResourcePropertyRequest::

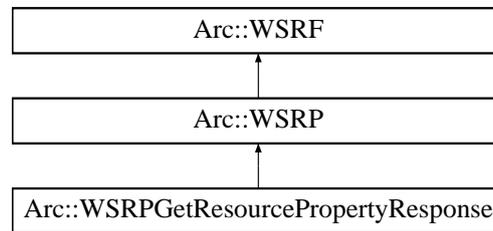


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.296 Arc::WSRPGetResourcePropertyResponse Class Reference

Inheritance diagram for Arc::WSRPGetResourcePropertyResponse::

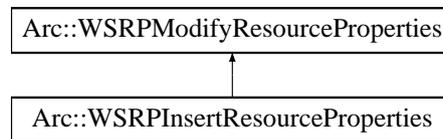


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.297 Arc::WSRPIInsertResourceProperties Class Reference

Inheritance diagram for Arc::WSRPIInsertResourceProperties::

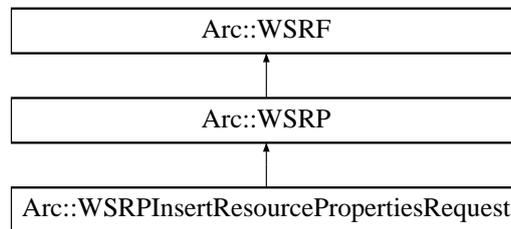


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.298 Arc::WSRPInsertResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPInsertResourcePropertiesRequest::

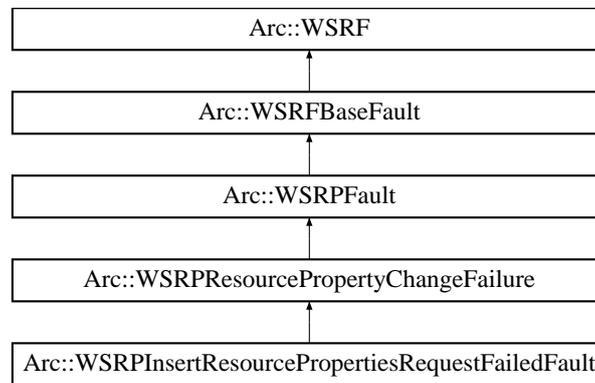


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.299 Arc::WSRPInsertResourcePropertiesRequestFailedFault Class Reference

Inheritance diagram for Arc::WSRPInsertResourcePropertiesRequestFailedFault::

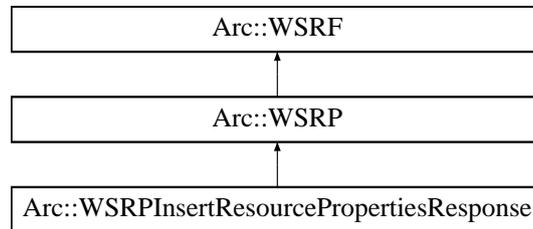


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.300 Arc::WSRPInsertResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPInsertResourcePropertiesResponse::

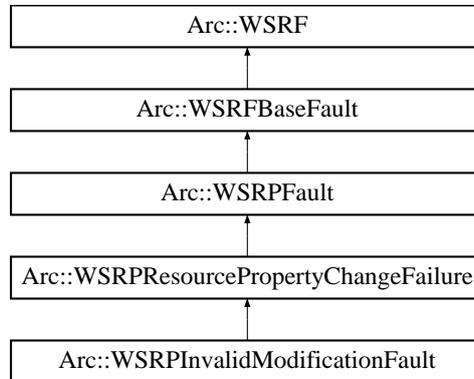


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.301 Arc::WSRPInvalidModificationFault Class Reference

Inheritance diagram for Arc::WSRPInvalidModificationFault::

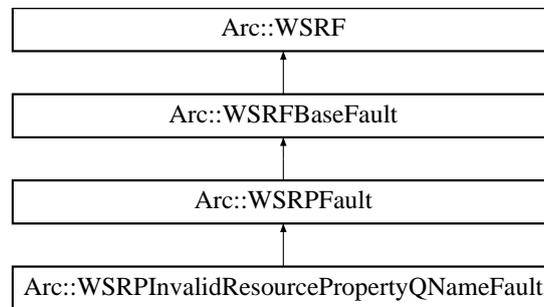


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.302 Arc::WSRPInvalidResourcePropertyQNameFault Class Reference

Inheritance diagram for Arc::WSRPInvalidResourcePropertyQNameFault::

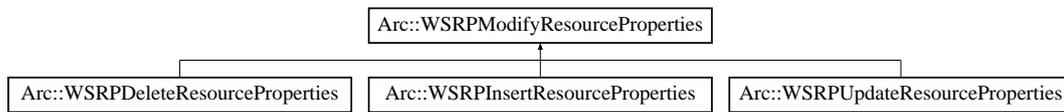


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.303 Arc::WSRPModifyResourceProperties Class Reference

Inheritance diagram for Arc::WSRPModifyResourceProperties::

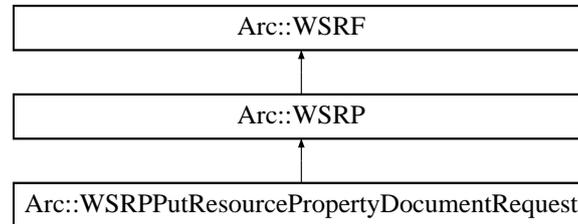


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.304 Arc::WSRPPutResourcePropertyDocumentRequest Class Reference

Inheritance diagram for Arc::WSRPPutResourcePropertyDocumentRequest::

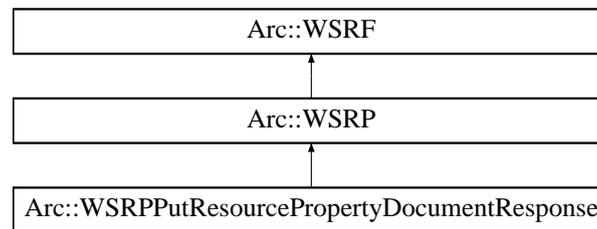


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.305 Arc::WSRPPutResourcePropertyDocumentResponse Class Reference

Inheritance diagram for Arc::WSRPPutResourcePropertyDocumentResponse::

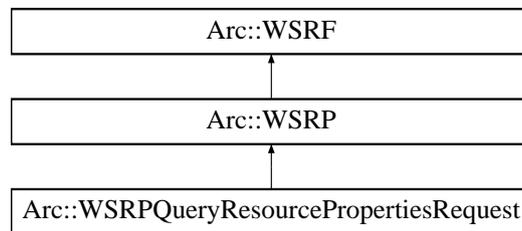


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.306 Arc::WSRPQueryResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPQueryResourcePropertiesRequest::

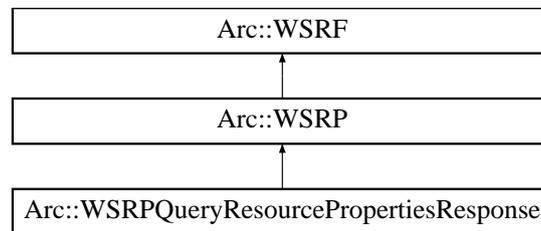


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.307 Arc::WSRPQueryResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPQueryResourcePropertiesResponse::

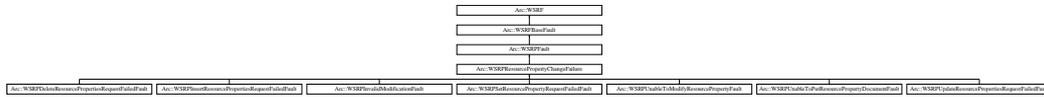


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.308 Arc::WSRPResourcePropertyChangeFailure Class Reference

#include <WSResourceProperties.h> Inheritance diagram for Arc::WSRPResourcePropertyChangeFailure::



Public Member Functions

- **WSRPResourcePropertyChangeFailure** (SOAPEnvelope &soap)
- **WSRPResourcePropertyChangeFailure** (const std::string &type)

6.308.1 Detailed Description

Base class for WS-ResourceProperties faults which contain ResourcePropertyChangeFailure

6.308.2 Constructor & Destructor Documentation

6.308.2.1 Arc::WSRPResourcePropertyChangeFailure::WSRPResourcePropertyChangeFailure (SOAPEnvelope & soap) [inline]

Constructor - creates object out of supplied SOAP tree.

6.308.2.2 Arc::WSRPResourcePropertyChangeFailure::WSRPResourcePropertyChangeFailure (const std::string & type) [inline]

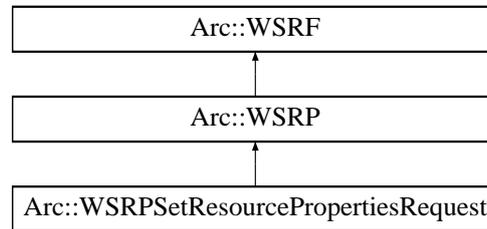
Constructor - creates new **WSRP** (p. 463) fault

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

- WSResourceProperties.h

6.309 Arc::WSRPSetResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPSetResourcePropertiesRequest::

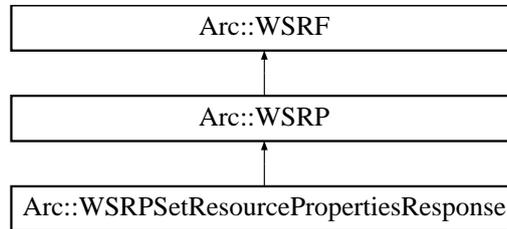


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.310 Arc::WSRPSetResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPSetResourcePropertiesResponse::

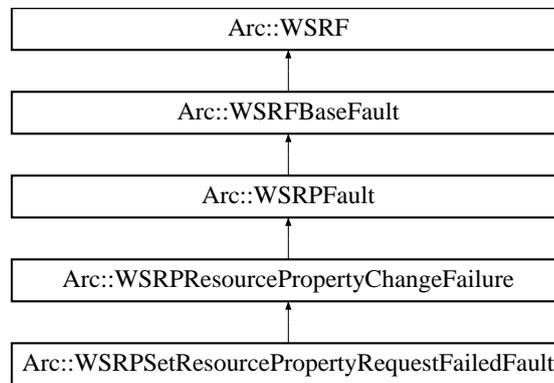


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.311 Arc::WSRPSetResourcePropertyRequestFailedFault Class Reference

Inheritance diagram for Arc::WSRPSetResourcePropertyRequestFailedFault::

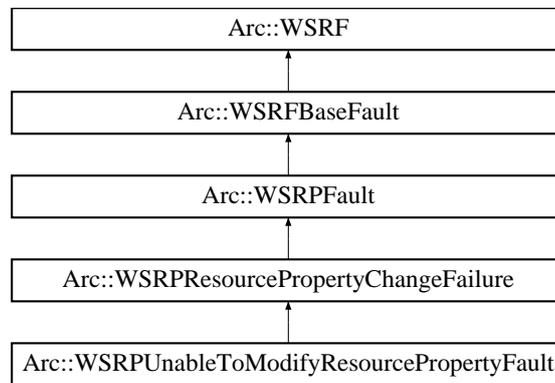


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.312 Arc::WSRPUnableToModifyResourcePropertyFault Class Reference

Inheritance diagram for Arc::WSRPUnableToModifyResourcePropertyFault:

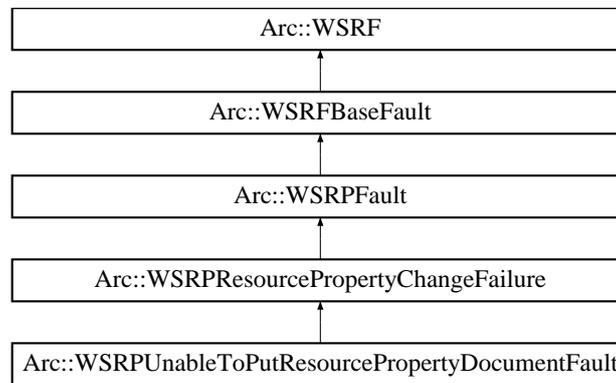


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.313 Arc::WSRPUnableToPutResourcePropertyDocumentFault Class Reference

Inheritance diagram for Arc::WSRPUnableToPutResourcePropertyDocumentFault::

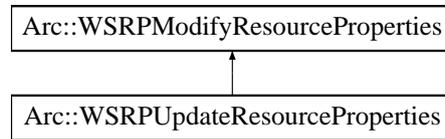


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.314 Arc::WSRPUdteResourceProperties Class Reference

Inheritance diagram for Arc::WSRPUdteResourceProperties::

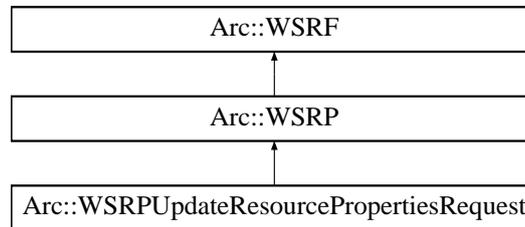


The documentation for this class was generated from the following file:

- `WSResourceProperties.h`

6.315 Arc::WSRPUdteResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPUdteResourcePropertiesRequest::

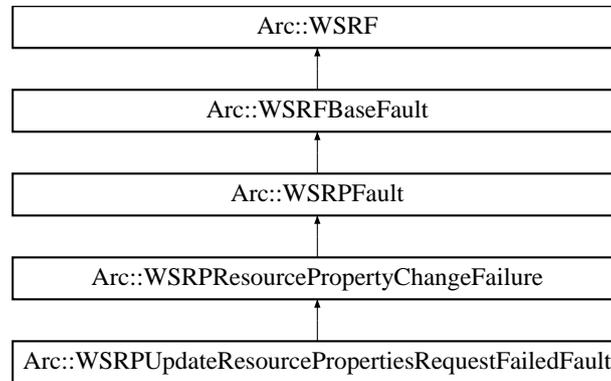


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.316 Arc::WSRPUUpdateResourcePropertiesRequestFailedFault Class Reference

Inheritance diagram for Arc::WSRPUUpdateResourcePropertiesRequestFailedFault::

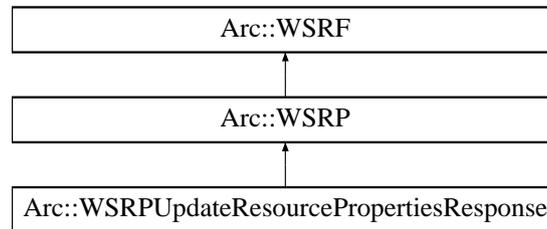


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.317 Arc::WSRPUdteResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPUdteResourcePropertiesResponse::

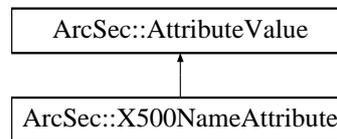


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.318 ArcSec::X500NameAttribute Class Reference

Inheritance diagram for ArcSec::X500NameAttribute::



Public Member Functions

- virtual std::string **encode** ()
- virtual std::string **getType** ()
- virtual std::string **getId** ()

6.318.1 Member Function Documentation

6.318.1.1 virtual std::string ArcSec::X500NameAttribute::encode () [inline, virtual]

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 78).

6.318.1.2 virtual std::string ArcSec::X500NameAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

6.318.1.3 virtual std::string ArcSec::X500NameAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 78).

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

- X500NameAttribute.h

6.319 Arc::X509Token Class Reference

Class for manipulating X.509 Token **Profile** (p. 353).

```
#include <X509Token.h>
```

Public Types

- enum **X509TokenType**

Public Member Functions

- **X509Token** (SOAPEnvelope &soap)
- **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)

6.319.1 Detailed Description

Class for manipulating X.509 Token **Profile** (p. 353). 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.

6.319.2 Member Enumeration Documentation

6.319.2.1 enum Arc::X509Token::X509TokenType

X509TokeType is for distinguishing two types of operation. It is used as the parameter of constructor.

6.319.3 Constructor & Destructor Documentation

6.319.3.1 Arc::X509Token::X509Token (SOAPEnvelope & soap)

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** (p. 498) 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.

6.319.3.2 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.

6.319.3.3 Arc::X509Token::~~X509Token (void)

Deconstructor. Nothing to be done except finalizing the xmlsec library.

6.319.4 Member Function Documentation**6.319.4.1 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.

6.319.4.2 bool Arc::X509Token::Authenticate (const std::string & *cafile*, const std::string & *capath*)

Check signature by using the certficare information in **X509Token** (p. 498) which is parsed by the constructor, and the trusted certificates specified as one of the two parameters. Not only the signature (in the **X509Token** (p. 498)) 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

6.319.4.3 Arc::X509Token::operator bool (void)

Returns true of constructor succeeded

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

- X509Token.h

6.320 Arc::XmlContainer Class Reference

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

- XmlContainer.h

6.321 Arc::XmlDatabase Class Reference

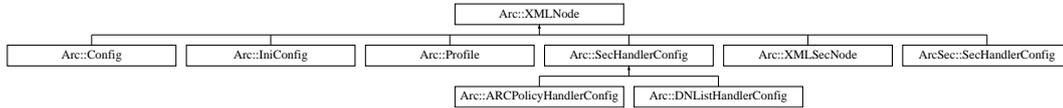
The documentation for this class was generated from the following file:

- XmlDatabase.h

6.322 Arc::XMLNode Class Reference

Wrapper for LibXML library Tree interface.

#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** &new_node) const
- **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) const
- **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) const
- **XMLNode Attribute** (const char *name) const
- **XMLNode Attribute** (const std::string &name) const
- **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) const
- **XMLNodeList XPathLookup** (const std::string &xpathExpr, const **NS** &nsList) const
- **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)

Protected Member Functions

- **XMLNode** (xmlNodePtr node)

Protected Attributes

- bool **is_owner_**
- bool **is_temporary_**

6.322.1 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.

6.322.2 Constructor & Destructor Documentation

6.322.2.1 `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.

6.322.2.2 `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.

6.322.2.3 `Arc::XMLNode::XMLNode(const XMLNode & node)` `[inline]`

Copies existing instance. Underlying XML element is NOT copied. Ownership is NOT inherited.

6.322.2.4 `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

6.322.2.5 `Arc::XMLNode::XMLNode(const char * xml, int len = -1)`

Same as previous

6.322.2.6 `Arc::XMLNode::XMLNode(long ptr_addr)`

Copy constructor. Used by language bindings

6.322.2.7 `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

6.322.2.8 `Arc::XMLNode::~XMLNode(void)`

Destructor Also destroys underlying XML document if owned by this instance

6.322.3 Member Function Documentation

6.322.3.1 `XMLNode Arc::XMLNode::Attribute(const std::string & name) const` `[inline]`

Returns `XMLNode` (p. 502) instance representing first attribute of node with specified by name

References `Attribute()`.

6.322.3.2 XMLNode Arc::XMLNode::Attribute (const char * *name*) const

Returns **XMLNode** (p. 502) instance representing first attribute of node with specified by name

6.322.3.3 XMLNode Arc::XMLNode::Attribute (int *n* = 0) const

Returns list of all attributes of node. Returns **XMLNode** (p. 502) instance representing n-th attribute of node.

Referenced by Attribute().

6.322.3.4 int Arc::XMLNode::AttributesSize (void) const

Returns number of attributes of node

6.322.3.5 XMLNode Arc::XMLNode::Child (int *n* = 0) const

Returns **XMLNode** (p. 502) instance representing n-th child of XML element. If such does not exist invalid **XMLNode** (p. 502) instance is returned Returns **XMLNode** (p. 502) instance representing n-th child of XML element. If such does not exist invalid **XMLNode** (p. 502) instance is returned

6.322.3.6 void Arc::XMLNode::Destroy (void)

Destroys underlying XML element. XML element is unlinked from XML tree and destroyed. After this operation **XMLNode** (p. 502) instance becomes invalid

6.322.3.7 std::string Arc::XMLNode::FullName (void) const [inline]

Returns prefix:name of XML node

References Name(), and Prefix().

6.322.3.8 XMLNode Arc::XMLNode::Get (const std::string & *name*) const [inline]

Same as operator[]

References operator[]().

6.322.3.9 void Arc::XMLNode::GetDoc (std::string & *out_xml_str*, bool *user_friendly* = false) const

Fills argument with whole XML document textual representation

6.322.3.10 XMLNode Arc::XMLNode::GetRoot (void)

Get the root node from any child node of the tree

6.322.3.11 `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

6.322.3.12 `void Arc::XMLNode::GetXML (std::string & out_xml_str, bool user_friendly = false) const`

Fills argument with this instance XML subtree textual representation

6.322.3.13 `void Arc::XMLNode::Name (const std::string & name) [inline]`

Assigns new name to XML node

References Name().

6.322.3.14 `void Arc::XMLNode::Name (const char * name)`

Assigns new name to XML node

6.322.3.15 `std::string Arc::XMLNode::Name (void) const`

Returns name of XML node

Referenced by FullName(), and Name().

6.322.3.16 `std::string Arc::XMLNode::Namespace (void) const`

Returns namespace URI of XML node

6.322.3.17 `std::string Arc::XMLNode::NamespacePrefix (const char * urn)`

Returns prefix of specified namespace. Empty string if no such namespace.

6.322.3.18 `NS Arc::XMLNode::Namespaces (void)`

Returns namespaces known at this node

6.322.3.19 `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 behavior). 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 unlimited recursion use -1. If recursion is limited then value of keep is ignored and existing namespaces are always kept.

6.322.3.20 void Arc::XMLNode::New (XMLNode & *new_node*) const

Creates a copy of XML (sub)tree. If object does not represent whole document - top level document is created. 'new_node' becomes a pointer owning new XML document.

6.322.3.21 XMLNode Arc::XMLNode::NewAttribute (const std::string & *name*) [inline]

Creates new attribute with specified name.

References NewAttribute().

6.322.3.22 XMLNode Arc::XMLNode::NewAttribute (const char * *name*)

Creates new attribute with specified name.

Referenced by NewAttribute().

6.322.3.23 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 referring to new child. XML element is a copy of supplied one but not owned by returned instance

6.322.3.24 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)** (p. 507)

References NewChild().

6.322.3.25 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)** (p. 507)

6.322.3.26 XMLNode Arc::XMLNode::NewChild (const std::string & *name*, int *n* = -1, bool *global_order* = false) [inline]

Same as **NewChild(const char*,int,bool)** (p. 507)

References NewChild().

6.322.3.27 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().

6.322.3.28 Arc::XMLNode::operator bool (void) const [inline]

Returns true if instance points to XML element - valid instance

References is_temporary_.

6.322.3.29 Arc::XMLNode::operator std::string (void) const

Returns textual content of node excluding content of children nodes

6.322.3.30 bool Arc::XMLNode::operator! (void) const [inline]

Returns true if instance does not point to XML element - invalid instance

References is_temporary_.

6.322.3.31 bool Arc::XMLNode::operator!= (const char * str) [inline]

This operator is needed to avoid ambiguity

6.322.3.32 bool Arc::XMLNode::operator!= (const std::string & str) [inline]

This operator is needed to avoid ambiguity

6.322.3.33 bool Arc::XMLNode::operator!= (bool val) [inline]

This operator is needed to avoid ambiguity

6.322.3.34 bool Arc::XMLNode::operator!= (const XMLNode & node) [inline]

Returns false if 'node' represents same XML element

6.322.3.35 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.

6.322.3.36 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.

6.322.3.37 XMLNode& Arc::XMLNode::operator= (const XMLNode & node)

Make instance refer to another XML node. Ownership is not inherited.

6.322.3.38 XMLNode& Arc::XMLNode::operator= (const std::string & *content*) [inline]

Sets textual content of node. All existing children nodes are discarded.

References operator=().

6.322.3.39 XMLNode& Arc::XMLNode::operator= (const char * *content*)

Sets textual content of node. All existing children nodes are discarded.

Referenced by operator=(), and Set().

6.322.3.40 bool Arc::XMLNode::operator== (const char * *str*) [inline]

This operator is needed to avoid ambiguity

6.322.3.41 bool Arc::XMLNode::operator== (const std::string & *str*) [inline]

This operator is needed to avoid ambiguity

6.322.3.42 bool Arc::XMLNode::operator== (bool *val*) [inline]

This operator is needed to avoid ambiguity

6.322.3.43 bool Arc::XMLNode::operator== (const XMLNode & *node*) [inline]

Returns true if 'node' represents same XML element

Referenced by Same().

6.322.3.44 XMLNode Arc::XMLNode::operator[] (int *n*) const

Returns **XMLNode** (p. 502) 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]

6.322.3.45 XMLNode Arc::XMLNode::operator[] (const std::string & *name*) const [inline]

Similar to previous method

References operator[]().

6.322.3.46 XMLNode Arc::XMLNode::operator[] (const char * *name*) const

Returns **XMLNode** (p. 502) instance representing first child element with specified name. Name may be "namespace_prefix.name" or simply "name". In last case namespace is ignored. If such node does not exist invalid **XMLNode** (p. 502) instance is returned

Referenced by Get(), and operator[]().

6.322.3.47 XMLNode Arc::XMLNode::Parent (void)

Get the parent node from any child node of the tree

6.322.3.48 XMLNodeList Arc::XMLNode::Path (const std::string & path) const

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.

6.322.3.49 std::string Arc::XMLNode::Prefix (void) const

Returns namespace prefix of XML node

Referenced by FullName().

6.322.3.50 bool Arc::XMLNode::ReadFromFile (const std::string & file_name)

Read XML document from file and associate it with this node

6.322.3.51 bool Arc::XMLNode::ReadFromStream (std::istream & in)

Read XML document from stream and associate it with this node

6.322.3.52 void Arc::XMLNode::Replace (const XMLNode & node)

Makes a copy of supplied XML node and makes this instance refer to it

6.322.3.53 bool Arc::XMLNode::Same (const XMLNode & node) [inline]

Returns true if 'node' represents same XML element - for bindings

References operator==().

6.322.3.54 bool Arc::XMLNode::SaveToFile (const std::string & file_name) const

Save string representation of node to file

6.322.3.55 bool Arc::XMLNode::SaveToStream (std::ostream & out) const

Save string representation of node to stream

6.322.3.56 void Arc::XMLNode::Set (const std::string & content) [inline]

Same as operator=. Used for bindings.

References operator=().

6.322.3.57 `int Arc::XMLNode::Size (void) const`

Returns number of children nodes

6.322.3.58 `XMLNodeList Arc::XMLNode::XPathLookup (const std::string & xpathExpr, const NS & nsList) const`

Uses xPath to look up the whole xml structure, Returns a list of **XMLNode** (p. 502) 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** (p. 356) is run on whole XML document but only the elements belonging to this XML subtree are returned.

6.322.4 **Field Documentation****6.322.4.1** `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.

6.322.4.2 `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

6.323 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)
- **XMLNode** **operator[]** (int)
- std::list< **XMLNode** > **Nodes** (void)

6.323.1 Detailed Description

Container for multiple **XMLNode** (p. 502) elements

6.323.2 Constructor & Destructor Documentation

6.323.2.1 Arc::XMLNodeContainer::XMLNodeContainer (void)

Default constructor

6.323.2.2 Arc::XMLNodeContainer::XMLNodeContainer (const XMLNodeContainer &)

Copy constructor. Add nodes from argument. Nodes owning XML document are copied using **AddNew()** (p. 513). Not owning nodes are linked using **Add()** (p. 512) method.

6.323.3 Member Function Documentation

6.323.3.1 void Arc::XMLNodeContainer::Add (const std::list< XMLNode > &)

Link multiple XML subtrees to container.

6.323.3.2 void Arc::XMLNodeContainer::Add (const XMLNode &)

Link XML subtree referred by node to container. XML tree must be available as long as this object is used.

6.323.3.3 void Arc::XMLNodeContainer::AddNew (const std::list< XMLNode > &)

Copy multiple XML subtrees to container.

6.323.3.4 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.

6.323.3.5 std::list<XMLNode> Arc::XMLNodeContainer::Nodes (void)

Returns all stored nodes.

6.323.3.6 XMLNodeContainer& Arc::XMLNodeContainer::operator= (const XMLNodeContainer &)

Same as copy constructor with current nodes being deleted first.

6.323.3.7 XMLNode Arc::XMLNodeContainer::operator[] (int)

Returns n-th node in a store.

6.323.3.8 int Arc::XMLNodeContainer::Size (void)

Return number of refered/stored nodes.

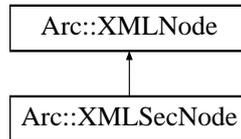
The documentation for this class was generated from the following file:

- XMLNode.h

6.324 Arc::XMLSecNode Class Reference

Extends **XMLNode** (p. 502) class to support XML security operation.

#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 enrpt_type)
- bool **DecryptNode** (const std::string &privkey_file, **XMLNode** &decrypted_node)

6.324.1 Detailed Description

Extends **XMLNode** (p. 502) class to support XML security operation. All **XMLNode** (p. 502) methods are exposed by inheriting from **XMLNode** (p. 502). **XMLSecNode** (p. 514) itself does not own node, instead it uses the node from the base class **XMLNode** (p. 502).

6.324.2 Constructor & Destructor Documentation

6.324.2.1 Arc::XMLSecNode::XMLSecNode (XMLNode & node)

Create a object based on an **XMLNode** (p. 502) instance.

6.324.3 Member Function Documentation

6.324.3.1 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_SHA1

6.324.3.2 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

6.324.3.3 bool Arc::XMLSecNode::EncryptNode (const std::string & *cert_file*, const SymEncryptionType *encrypt_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
encrypt_type The encryption type when encrypting the node, four option in SymEncryptionType
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).

6.324.3.4 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

6.324.3.5 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:

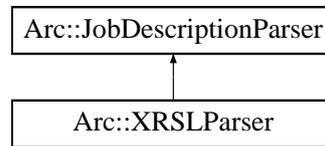
id_name The id of this node, which is used for identifying the node
ca_file The CA file which used as trusted certificate when verify the certificate in the <KeyInfo> part of <Signature>
ca_path The CA directory; either ca_file or ca_path should be set.

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

- XMLSecNode.h

6.325 Arc::XRSLParser Class Reference

Inheritance diagram for Arc::XRSLParser::



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

- XRSLParser.h

Chapter 7

File Documentation

7.1 URL.h File Reference

Class to hold general URL's. `#include <iostream>`

```
#include <list>
```

```
#include <map>
```

```
#include <string>
```

Data Structures

- class **Arc::URL**
- class **Arc::URLLocation**

Class to hold a resolved URL (p. 435) location.

- class **Arc::PathIterator**

Class to iterate through elements of path.

Namespaces

- namespace **Arc**

Defines

- `#define RC_DEFAULT_PORT 389`

Functions

- `std::list< URL > Arc::ReadURLList (const URL &urllist)`

7.1.1 Detailed Description

Class to hold general URL's. The URL is split into protocol, hostname, port and path. This class tries to follow RFC 3986 for splitting URLs at least for protocol + host part. It also accepts local file paths which are converted to `file:path`. Usual system dependant file paths are supported. Relative paths are converted to absolute ones by prepending them with current working directory path. File path can't start from # symbol (why?). If string representation of URL starts from '@' then it is treated as path to file containing list of URLs. Simple URL is parsed in following way: `[protocol:][//[username:passwd (p.310)@][host][:port]][;urloptions[;...]][/path[?httpoption[&...]][:metadatooption[...]]]` 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. 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:` 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` `file:to` 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.

7.1.2 Define Documentation

7.1.2.1 `#define RC_DEFAULT_PORT 389`

Default ports for different protocols

Index

- ~BrokerLoader
 - Arc::BrokerLoader, 89
- ~Counter
 - Arc::Counter, 121
- ~DMCLoader
 - Arc::DMCLoader, 194
- ~Database
 - Arc::Database, 138
- ~FileCache
 - Arc::FileCache, 213
- ~IntraProcessCounter
 - Arc::IntraProcessCounter, 244
- ~JobControllerLoader
 - Arc::JobControllerLoader, 253
- ~Loader
 - Arc::Loader, 263
- ~Logger
 - Arc::Logger, 266
- ~MCCLoader
 - Arc::MCCLoader, 281
- ~Message
 - Arc::Message, 287
- ~PayloadRaw
 - Arc::PayloadRaw, 313
- ~PayloadStream
 - Arc::PayloadStream, 320
- ~Plexer
 - Arc::Plexer, 336
- ~Query
 - Arc::Query, 356
- ~Run
 - Arc::Run, 384
- ~SAMLToken
 - Arc::SAMLToken, 392
- ~SOAPMessage
 - Arc::SOAPMessage, 410
- ~SubmitterLoader
 - Arc::SubmitterLoader, 420
- ~TargetRetrieverLoader
 - Arc::TargetRetrieverLoader, 425
- ~URL
 - Arc::URL, 437
- ~URLLocation
 - Arc::URLLocation, 444
- ~WSAEndpointReference
 - Arc::WSAEndpointReference, 453
- ~X509Token
 - Arc::X509Token, 499
- ~XMLNode
 - Arc::XMLNode, 504
- Acquire
 - Arc::DelegationConsumer, 178
 - Arc::InformationContainer, 236
- acquireDelegation
 - Arc::ClientX509Delegation, 109
- Action
 - Arc::WSAHeader, 456
- Add
 - Arc::MessageContext, 294
 - Arc::XMLNodeContainer, 512
- add
 - Arc::DataBuffer, 141
 - Arc::MessageAttributes, 290
 - Arc::SoftwareRequirement, 414
- AddCADir
 - Arc::BaseConfig, 84
- AddCAFile
 - Arc::BaseConfig, 84
- AddCertExtObj
 - Arc::Credential, 131
- AddCertificate
 - Arc::BaseConfig, 84
- AddChain
 - Arc::VOMSTrustList, 452
- addDestination
 - Arc::Logger, 266
- AddDN
 - Arc::FileCache, 214
- AddExtension
 - Arc::Credential, 131
- AddLDAPAttribute
 - Arc::URL, 437
- AddLocation
 - Arc::DataPoint, 152
 - Arc::DataPointDirect, 159
 - Arc::DataPointIndex, 163
- AddNew
 - Arc::XMLNodeContainer, 512
- AddOption

- Arc::URL, 437
- AddOverlay
 - Arc::BaseConfig, 84
- AddPluginsPath
 - Arc::BaseConfig, 84
- addPolicy
 - ArcSec::Evaluator, 202
 - ArcSec::Policy, 346
- AddPrivateKey
 - Arc::BaseConfig, 85
- AddProxy
 - Arc::BaseConfig, 85
- AddRegex
 - Arc::VOMSTrustList, 452
- addRegistrars
 - Arc::InfoRegisterContainer, 233
- addRequestItem
 - ArcSec::Request, 364
- Address
 - Arc::WSAEndpointReference, 454
- AddSecHandler
 - Arc::ClientSOAP, 105
 - Arc::MCC, 275
 - Arc::Service, 405
- addService
 - Arc::InfoRegisterContainer, 233
 - Arc::InfoRegistrar, 235
- AddSignatureTemplate
 - Arc::XMLSecNode, 514
- addVOMSAC
 - Arc, 36
- allocated
 - Arc::PayloadRawBuf, 316
- allocated_
 - Arc::WSRF, 459
- ApplicationEnvironments
 - Arc::ExecutionTarget, 209
- ApplySecurity
 - Arc::DataPoint, 152
- approveCSR
 - Arc::OAuthConsumer, 305
 - Arc::SAML2SSOHTTPClient, 389
- Arc, 23
 - addVOMSAC, 36
 - AttrConstIter, 34
 - AttrIter, 34
 - AttrMap, 35
 - BUSY_ERROR, 35
 - ContentFromPayload, 36
 - CreateThreadFunction, 36
 - createVOMSAC, 36
 - CredentialLogger, 40
 - final_xmlsec, 36
 - GENERIC_ERROR, 35
 - get_cert_str, 36
 - get_key_from_certfile, 37
 - get_key_from_certstr, 37
 - get_key_from_keyfile, 37
 - get_key_from_keystr, 37
 - get_node, 37
 - get_plugin_instance, 35
 - init_xmlsec, 37
 - load_key_from_certfile, 37
 - load_key_from_certstr, 37
 - load_key_from_keyfile, 37
 - load_trusted_cert_file, 37
 - load_trusted_cert_str, 38
 - load_trusted_certs, 38
 - LogLevel, 35
 - MatchXMLName, 38
 - MatchXMLNamespace, 38
 - OpenSSLInit, 38
 - operator<<, 38, 39
 - parseVOMSAC, 39
 - PARSING_ERROR, 35
 - passphrase_callback, 40
 - plugins_table_name, 40
 - PROTOCOL_RECOGNIZED_ERROR, 35
 - SESSION_CLOSE, 35
 - STATUS_OK, 35
 - StatusKind, 35
 - string, 40
 - thread_stacksize, 41
 - TimeStamp, 40
 - UNKNOWN_SERVICE_ERROR, 35
 - VOMSDecode, 40
 - WSAFault, 35
 - WSAFaultAssign, 40
 - WSAFaultExtract, 40
 - WSAFaultInvalidAddressingHeader, 36
 - WSAFaultUnknown, 36
- Arc::Adler32Sum, 62
- Arc::ApplicationEnvironment, 65
- Arc::ApplicationType, 66
- Arc::ARCJSDLParser, 67
- Arc::ArcLocation, 68
 - GetPlugins, 68
 - Init, 68
- Arc::ARCPolicyHandlerConfig, 70
- Arc::AttributeIterator, 73
 - AttributeIterator, 73
 - current_, 75
 - end_, 75
 - hasMore, 74
 - key, 74
 - MessageAttributes, 75
 - operator*, 74
 - operator++, 74

- operator->, 74
- Arc::AutoPointer, 82
- Arc::Base64, 83
- Arc::BaseConfig, 84
 - AddCAGDir, 84
 - AddCAFile, 84
 - AddCertificate, 84
 - AddOverlay, 84
 - AddPluginsPath, 84
 - AddPrivateKey, 85
 - AddProxy, 85
 - GetOverlay, 85
 - MakeConfig, 85
- Arc::Broker, 87
 - GetBestTarget, 87
 - PossibleTargets, 88
 - PreFilterTargets, 87
 - SortTargets, 88
- Arc::BrokerLoader, 89
 - ~BrokerLoader, 89
 - BrokerLoader, 89
 - GetBrokers, 89
 - load, 89
- Arc::BrokerPluginArgument, 91
- Arc::ByteArray, 92
- Arc::CacheParameters, 93
- Arc::ChainContext, 95
 - operator PluginsFactory *, 95
- Arc::Checksum, 96
- Arc::ChecksumAny, 97
- Arc::CIStrngValue, 98
 - CIStrngValue, 98
 - equal, 98
 - operator bool, 98
- Arc::ClassLoader, 100
- Arc::ClassLoaderPluginArgument, 101
- Arc::ClientHTTP, 102
- Arc::ClientHTTPwithSAML2SSO, 103
 - ClientHTTPwithSAML2SSO, 103
 - process, 103
- Arc::ClientInterface, 104
- Arc::ClientSOAP, 105
 - AddSecHandler, 105
 - ClientSOAP, 105
 - GetEntry, 105
 - Load, 106
 - process, 106
- Arc::ClientSOAPwithSAML2SSO, 107
 - ClientSOAPwithSAML2SSO, 107
 - process, 107
- Arc::ClientTCP, 108
- Arc::ClientX509Delegation, 109
 - acquireDelegation, 109
 - ClientX509Delegation, 109
 - createDelegation, 109
- Arc::Config, 113
 - Config, 113, 114
 - getFileName, 114
 - parse, 114
 - print, 114
 - save, 114
 - setFileName, 114
- Arc::ConfusaCertHandler, 115
 - ConfusaCertHandler, 115
 - createCertRequest, 115
 - getCertRequestB64, 115
- Arc::ConfusaParserUtils, 116
 - destroy_doc, 116
 - evaluate_path, 116
 - extract_body_information, 116
 - get_doc, 116
 - handle_redirect_step, 116
 - urlencode, 117
 - urlencode_params, 117
- Arc::CountedPointer, 118
- Arc::Counter, 119
 - ~Counter, 121
 - cancel, 121
 - changeExcess, 121
 - changeLimit, 121
 - Counter, 121
 - extend, 122
 - getCounterTicket, 122
 - getCurrentTime, 122
 - getExcess, 123
 - getExpirationReminder, 123
 - getExpiryTime, 123
 - getLimit, 123
 - getValue, 124
 - IDType, 121
 - reserve, 124
 - setExcess, 124
 - setLimit, 124
- Arc::CounterTicket, 126
 - cancel, 126
 - CounterTicket, 126
 - extend, 126
 - isValid, 127
- Arc::CRC32Sum, 128
- Arc::Credential, 129
 - AddCertExtObj, 131
 - AddExtension, 131
 - Credential, 130, 131
 - GenerateEECRequest, 131, 132
 - GenerateRequest, 132
 - GetCert, 132
 - GetCertNumofChain, 132
 - GetCertReq, 132

- GetDN, 132
- GetEndTime, 132
- getFormat, 133
- GetIdentityName, 133
- GetLifeTime, 133
- GetPrivKey, 133
- GetProxyPolicy, 133
- GetPubKey, 133
- GetStartTime, 133
- GetType, 133
- InitProxyCertInfo, 133
- InquireRequest, 133, 134
- LogError, 134
- OutputCertificate, 134
- OutputCertificateChain, 134
- OutputPrivatekey, 134
- OutputPublickey, 134
- SetLifeTime, 134
- SetProxyPolicy, 135
- SetStartTime, 135
- SignEECRequest, 135
- SignRequest, 135
- STACK_OF, 136
- Arc::CredentialError, 137
 - CredentialError, 137
- Arc::Database, 138
 - ~Database, 138
 - close, 139
 - connect, 139
 - Database, 138
 - enable_ssl, 139
 - isconnected, 139
 - shutdown, 139
- Arc::DataBuffer, 140
 - add, 141
 - buffer_size, 141
 - checksum_object, 141
 - checksum_valid, 142
 - DataBuffer, 141
 - eof_read, 142
 - eof_write, 142
 - error, 142
 - error_read, 142
 - error_write, 142
 - for_read, 143
 - for_write, 143
 - is_notwritten, 143
 - is_read, 144
 - is_written, 144
 - set, 144
 - wait_any, 145
- Arc::DataCallback, 146
- Arc::DataHandle, 147
- Arc::DataMover, 148
 - checks, 148
 - force_to_meta, 148
 - secure, 149
 - set_default_max_inactivity_time, 149
 - set_default_min_average_speed, 149
 - set_default_min_speed, 149
 - Transfer, 149
 - verbose, 150
- Arc::DataPoint, 151
 - AddLocation, 152
 - ApplySecurity, 152
 - Check, 153
 - CompareMeta, 153
 - CurrentLocationMetadata, 153
 - GetFailureReason, 153
 - ListFiles, 153
 - NextLocation, 153
 - NextTry, 154
 - Passive, 154
 - PostRegister, 154
 - PreRegister, 154
 - PreUnregister, 154
 - ProvidesMeta, 155
 - Range, 155
 - ReadOutOfOrder, 155
 - Registered, 155
 - Resolve, 155
 - SetAdditionalChecks, 155
 - SetMeta, 156
 - SetSecure, 156
 - StartReading, 156
 - StartWriting, 156
 - StopReading, 156
 - StopWriting, 157
 - Unregister, 157
 - WriteOutOfOrder, 157
- Arc::DataPointDirect, 158
 - AddLocation, 159
 - CurrentLocationMetadata, 159
 - NextLocation, 159
 - Passive, 159
 - PostRegister, 159
 - PreRegister, 159
 - PreUnregister, 160
 - ProvidesMeta, 160
 - Range, 160
 - ReadOutOfOrder, 160
 - Registered, 160
 - Resolve, 160
 - SetAdditionalChecks, 161
 - SetSecure, 161
 - Unregister, 161
 - WriteOutOfOrder, 161
- Arc::DataPointIndex, 162

- AddLocation, 163
- Check, 163
- CurrentLocationMetadata, 163
- NextLocation, 163
- Passive, 163
- ProvidesMeta, 163
- Range, 163
- ReadOutOfOrder, 164
- Registered, 164
- SetAdditionalChecks, 164
- SetSecure, 164
- StartReading, 164
- StartWriting, 165
- StopReading, 165
- StopWriting, 165
- WriteOutOfOrder, 165
- Arc::DataSourceType, 166
- Arc::DataSpeed, 167
 - DataSpeed, 167
 - hold, 168
 - set_base, 168
 - set_max_data, 168
 - set_max_inactivity_time, 168
 - set_min_average_speed, 168
 - set_min_speed, 169
 - set_progress_indicator, 169
 - transfer, 169
 - verbose, 169
- Arc::DataStagingType, 170
- Arc::DataStatus, 171
 - CacheError, 171
 - CheckError, 172
 - CredentialsExpiredError, 172
 - DataStatusType, 171
 - DeleteError, 172
 - IsReadingError, 172
 - IsWritingError, 172
 - ListError, 172
 - LocationAlreadyExistsError, 172
 - NoLocationError, 172
 - NotInitializedError, 172
 - NotSupportedForDirectDataPointsError, 172
 - PostRegisterError, 171
 - PreRegisterError, 171
 - ReadAcquireError, 171
 - ReadError, 171
 - ReadResolveError, 171
 - ReadStartError, 171
 - ReadStopError, 171
 - StageError, 172
 - Success, 171
 - SystemError, 172
 - TransferError, 171
 - UnimplementedError, 172
 - UnknownError, 172
 - UnregisterError, 171
 - WriteAcquireError, 171
 - WriteError, 171
 - WriteResolveError, 171
 - WriteStartError, 171
 - WriteStopError, 171
- Arc::DataTargetType, 173
- Arc::DataType, 174
- Arc::DBranch, 177
- Arc::DelegationConsumer, 178
 - Acquire, 178
 - Backup, 179
 - DelegationConsumer, 178
 - Generate, 179
 - ID, 179
 - LogError, 179
 - Request, 179
 - Restore, 179
- Arc::DelegationConsumerSOAP, 180
 - DelegateCredentialsInit, 180
 - DelegatedToken, 180
 - DelegationConsumerSOAP, 180
 - UpdateCredentials, 181
- Arc::DelegationContainerSOAP, 182
 - context_lock_, 182
 - DelegateCredentialsInit, 182
 - DelegatedToken, 182
 - max_duration_, 182
 - max_size_, 183
 - max_usage_, 183
 - restricted_, 183
 - UpdateCredentials, 182
- Arc::DelegationProvider, 184
 - Delegate, 184
 - DelegationProvider, 184
- Arc::DelegationProviderSOAP, 185
 - DelegateCredentialsInit, 186
 - DelegatedToken, 186
 - DelegationProviderSOAP, 185
 - ID, 186
 - UpdateCredentials, 186
- Arc::DirectoryType, 188
- Arc::DiskSpaceRequirementType, 189
- Arc::DItem, 190
- Arc::DItemString, 191
- Arc::DMC, 192
- Arc::DMCConfig, 193
 - MakeConfig, 193
- Arc::DMCLoader, 194
 - ~DMCLoader, 194
 - DMCLoader, 194
- Arc::DMCPluginArgument, 195
- Arc::DNListHandlerConfig, 196

- Arc::ExecutableType, 208
- Arc::ExecutionTarget, 209
 - ApplicationEnvironments, 209
 - MaxDiskSpace, 209
 - MaxMainMemory, 209
 - MaxVirtualMemory, 209
 - OperatingSystem, 209
- Arc::ExpirationReminder, 211
 - getExpiryTime, 211
 - getReservationID, 211
 - operator<, 211
- Arc::FileCache, 212
 - ~FileCache, 213
 - AddDN, 214
 - CheckCreated, 214
 - CheckDN, 214
 - CheckValid, 214
 - Clean, 214
 - Copy, 214
 - File, 214
 - FileCache, 213
 - GetCreated, 215
 - GetValid, 215
 - Link, 215
 - operator bool, 215
 - operator==, 215
 - Release, 215
 - SetValid, 215
 - Start, 216
 - Stop, 216
 - StopAndDelete, 216
- Arc::FileInfo, 218
- Arc::FileLock, 219
- Arc::FileType, 220
- Arc::FinderLoader, 221
- Arc::GlobusResult, 225
- Arc::GSSCredential, 226
- Arc::HakaClient, 227
 - processConsent, 227
 - processIdP2Confusa, 227
 - processIdPLogin, 227
- Arc::HTTPClientInfo, 228
- Arc::InfoCache, 229
 - InfoCache, 229
- Arc::InfoCacheInterface, 230
 - Get, 230
- Arc::InfoFilter, 231
 - Filter, 231
 - InfoFilter, 231
- Arc::InfoRegister, 232
- Arc::InfoRegisterContainer, 233
 - addRegistrars, 233
 - addService, 233
 - removeService, 233
- Arc::InfoRegisters, 234
 - InfoRegisters, 234
- Arc::InfoRegistrar, 235
 - addService, 235
 - registration, 235
- Arc::InformationContainer, 236
 - Acquire, 236
 - Assign, 236
 - doc_, 237
 - Get, 236
 - InformationContainer, 236
- Arc::InformationInterface, 238
 - Get, 238
 - InformationInterface, 238
 - lock_, 239
- Arc::InformationRequest, 240
 - InformationRequest, 240
 - SOAP, 240
- Arc::InformationResponse, 241
 - InformationResponse, 241
 - Result, 241
- Arc::IniConfig, 242
- Arc::IntraProcessCounter, 244
 - ~IntraProcessCounter, 244
 - cancel, 245
 - changeExcess, 245
 - changeLimit, 245
 - extend, 245
 - getExcess, 246
 - getLimit, 246
 - getValue, 246
 - IntraProcessCounter, 244
 - reserve, 246
 - setExcess, 247
 - setLimit, 247
- Arc::ISIS_description, 248
- Arc::IString, 249
- Arc::JDLParser, 250
- Arc::Job, 251
- Arc::JobController, 252
- Arc::JobControllerLoader, 253
 - ~JobControllerLoader, 253
 - GetJobControllers, 253
 - JobControllerLoader, 253
 - load, 253
- Arc::JobControllerPluginArgument, 255
- Arc::JobDescription, 256
- Arc::JobDescriptionParser, 257
- Arc::JobIdentificationType, 258
- Arc::JobMetaType, 259
- Arc::JobState, 260
- Arc::JobSupervisor, 261
- Arc::LoadableModuleDescription, 262
- Arc::Loader, 263

- ~Loader, 263
- factory_, 263
- Loader, 263
- Arc::LogDestination, 264
 - LogDestination, 264
- Arc::Logger, 265
 - ~Logger, 266
 - addDestination, 266
 - getRootLogger, 266
 - getThreshold, 266
 - Logger, 265
 - msg, 266
 - setThreshold, 267
- Arc::LogMessage, 268
 - getLevel, 269
 - Logger, 269
 - LogMessage, 268
 - operator<<, 269
 - setIdentifier, 269
- Arc::LogStream, 270
 - log, 270
 - LogStream, 270
- Arc::MCC, 274
 - AddSecHandler, 275
 - logger, 276
 - MCC, 275
 - Next, 275
 - next_, 276
 - process, 275
 - ProcessSecHandlers, 275
 - sechandlers_, 276
 - Unlink, 275
- Arc::MCC_Status, 277
 - getExplanation, 277
 - getKind, 277
 - getOrigin, 278
 - isOk, 278
 - MCC_Status, 277
 - operator bool, 278
 - operator std::string, 278
- Arc::MCCConfig, 279
 - MakeConfig, 279
- Arc::MCCInterface, 280
 - process, 280
- Arc::MCCLoader, 281
 - ~MCCLoader, 281
 - MCCLoader, 281
 - operator[], 281
- Arc::MCCPluginArgument, 283
- Arc::MD5Sum, 284
- Arc::MemoryAllocationException, 285
- Arc::Message, 286
 - ~Message, 287
 - Attributes, 287
 - Auth, 287
 - AuthContext, 287
 - Context, 287
 - Message, 287
 - operator=, 288
 - Payload, 288
- Arc::MessageAttributes, 289
 - add, 290
 - attributes_, 291
 - count, 290
 - get, 290
 - getAll, 290
 - MessageAttributes, 289
 - remove, 290
 - removeAll, 291
 - set, 291
- Arc::MessageAuth, 292
 - Export, 292
 - Filter, 292
- Arc::MessageAuthContext, 293
- Arc::MessageContext, 294
 - Add, 294
- Arc::MessageContextElement, 295
- Arc::MessagePayload, 296
- Arc::ModuleManager, 297
 - findLocation, 297
 - load, 297
 - makePersistent, 298
 - ModuleManager, 297
 - reload, 298
 - setCfg, 298
 - unload, 298
- Arc::MultiSecAttr, 299
 - Export, 299
 - operator bool, 299
- Arc::MySQLDatabase, 300
 - close, 300
 - connect, 300
 - enable_ssl, 300
 - isconnected, 301
 - shutdown, 301
- Arc::MySQLQuery, 302
 - execute, 302
 - get_array, 302
 - get_num_columns, 302
 - get_num_rows, 302
 - get_row, 303
 - get_row_field, 303
- Arc::NS, 304
- Arc::OAuthConsumer, 305
 - approveCSR, 305
 - OAuthConsumer, 305
 - parseDN, 305
 - processLogin, 306

- pushCSR, 306
- storeCert, 306
- Arc::OpenIdpClient, 307
 - processConsent, 307
 - processIdP2Confusa, 307
 - processIdPLogin, 307
- Arc::OptionParser, 308
- Arc::PathIterator, 311
 - operator bool, 311
 - operator*, 311
 - operator++, 311
 - operator--, 311
 - PathIterator, 311
 - Rest, 311
- Arc::PayloadRaw, 313
 - ~PayloadRaw, 313
 - Buffer, 313
 - BufferPos, 314
 - BufferSize, 314
 - Content, 314
 - Insert, 314
 - operator[], 314
 - PayloadRaw, 313
 - Size, 314
 - Truncate, 314
- Arc::PayloadRawBuf, 316
 - allocated, 316
 - length, 316
 - size, 316
- Arc::PayloadRawInterface, 317
 - Buffer, 317
 - BufferPos, 317
 - BufferSize, 317
 - Content, 318
 - Insert, 318
 - operator[], 318
 - Size, 318
 - Truncate, 318
- Arc::PayloadSOAP, 319
 - PayloadSOAP, 319
- Arc::PayloadStream, 320
 - ~PayloadStream, 320
 - Get, 321
 - handle_, 322
 - operator bool, 321
 - PayloadStream, 320
 - Pos, 321
 - Put, 321, 322
 - seekable_, 322
 - Size, 322
 - Timeout, 322
- Arc::PayloadStreamInterface, 324
 - Get, 324
 - operator bool, 325
 - Pos, 325
 - Put, 325
 - Size, 325
 - Timeout, 325, 326
- Arc::PayloadWSRF, 327
 - PayloadWSRF, 327
- Arc::Period, 331
 - GetPeriod, 331
 - istr, 331
 - operator std::string, 331
 - operator<, 332
 - operator<=, 332
 - operator>, 332
 - operator>=, 332
 - operator=, 332
 - operator==, 332
 - Period, 331
 - SetPeriod, 332
- Arc::Plexer, 336
 - ~Plexer, 336
 - logger, 337
 - Next, 337
 - Plexer, 336
 - process, 337
- Arc::PlexerEntry, 338
- Arc::Plugin, 339
- Arc::PluginArgument, 340
 - get_factory, 340
 - get_module, 340
- Arc::PluginDescriptor, 342
- Arc::PluginsFactory, 343
 - get_instance, 343
 - load, 343
 - PluginsFactory, 343
- Arc::Printf, 351
- Arc::PrintfBase, 352
- Arc::Profile, 353
- Arc::Query, 356
 - ~Query, 356
 - execute, 356
 - get_array, 357
 - get_num_columns, 357
 - get_num_rows, 357
 - get_row, 357
 - get_row_field, 357
 - Query, 356
- Arc::Range, 359
- Arc::Register_Info_Type, 360
- Arc::RegisteredService, 361
 - RegisteredService, 361
- Arc::RegularExpression, 362
 - match, 362
- Arc::ResourceSlotType, 368
- Arc::ResourcesType, 369

- Arc::ResourceTargetType, 370
- Arc::RSL, 374
- Arc::RSLBoolean, 375
- Arc::RSLConcat, 376
- Arc::RSLCondition, 377
- Arc::RSLList, 378
- Arc::RSLLiteral, 379
- Arc::RSLParser, 380
- Arc::RSLSequence, 381
- Arc::RSLValue, 382
- Arc::RSLVariable, 383
- Arc::Run, 384
 - ~Run, 384
 - AssignStderr, 385
 - AssignStdin, 385
 - AssignStdout, 385
 - AssignWorkingDirectory, 385
 - CloseStderr, 385
 - CloseStdin, 385
 - CloseStdout, 385
 - KeepStderr, 385
 - KeepStdin, 385
 - KeepStdout, 385
 - Kill, 385
 - operator bool, 386
 - ReadStderr, 386
 - ReadStdout, 386
 - Result, 386
 - Run, 384
 - Running, 386
 - Start, 386
 - Wait, 386
 - WriteStdin, 386
- Arc::SAML2LoginClient, 388
 - findSimpleSAMLInstallation, 388
 - processLogin, 388
 - SAML2LoginClient, 388
- Arc::SAML2SSOHTTPClient, 389
 - approveCSR, 389
 - parseDN, 389
 - processConsent, 389
 - processIdP2Confusa, 389
 - processIdPLogin, 390
 - processLogin, 390
 - pushCSR, 390
 - storeCert, 390
- Arc::SAMLToken, 391
 - ~SAMLToken, 392
 - Authenticate, 393
 - operator bool, 393
 - SAMLToken, 392
 - SAMLVersion, 392
- Arc::ScalableTime, 394
- Arc::SecAttr, 395
 - Export, 395
 - Import, 396
 - operator bool, 396
 - operator==, 396
- Arc::SecAttrFormat, 397
- Arc::SecAttrValue, 398
 - operator bool, 398
 - operator==, 398
- Arc::SecHandlerConfig, 401
- Arc::Service, 404
 - AddSecHandler, 405
 - getID, 405
 - logger, 405
 - ProcessSecHandlers, 405
 - RegistrationCollector, 405
 - sechandlers_, 405
 - Service, 405
- Arc::ServicePluginArgument, 407
- Arc::SimpleCondition, 408
 - broadcast, 408
 - lock, 408
 - reset, 408
 - signal, 408
 - signal_nonblock, 408
 - unlock, 408
 - wait, 409
 - wait_nonblock, 409
- Arc::SOAPMessage, 410
 - ~SOAPMessage, 410
 - Attributes, 410
 - Payload, 410, 411
 - SOAPMessage, 410
- Arc::Software, 412
 - ComparisonOperator, 412
 - operator==, 413
 - Software, 413
- Arc::SoftwareRequirement, 414
 - add, 414
 - isSatisfied, 414
 - setRequirement, 414
- Arc::Submitter, 419
- Arc::SubmitterLoader, 420
 - ~SubmitterLoader, 420
 - GetSubmitters, 420
 - load, 420
 - SubmitterLoader, 420
- Arc::SubmitterPluginArgument, 422
- Arc::TargetGenerator, 423
- Arc::TargetRetriever, 424
- Arc::TargetRetrieverLoader, 425
 - ~TargetRetrieverLoader, 425
 - GetTargetRetrievers, 425
 - load, 425
 - TargetRetrieverLoader, 425

- Arc::TargetRetrieverPluginArgument, 427
- Arc::ThreadInitializer, 430
- Arc::Time, 431
 - GetFormat, 432
 - GetTime, 432
 - operator std::string, 432
 - operator<, 432
 - operator<=, 432
 - operator>, 433
 - operator>=, 433
 - operator+, 432
 - operator-, 432
 - operator=, 432, 433
 - operator==, 433
 - SetFormat, 433
 - SetTime, 433
 - str, 433
 - Time, 431
- Arc::URL, 435
 - ~URL, 437
 - AddLDAPAttribute, 437
 - AddOption, 437
 - BaseDN2Path, 437
 - ChangeHost, 437
 - ChangeLDAPFilter, 437
 - ChangeLDAPScope, 437
 - ChangePath, 437
 - ChangePort, 437
 - ChangeProtocol, 437
 - CommonLocOption, 437
 - CommonLocOptions, 438
 - commonlocoptions, 441
 - ConnectionURL, 438
 - FullPath, 438
 - fullstr, 438
 - Host, 438
 - host, 441
 - HTTPOption, 438
 - HTTPOptions, 438
 - httpoptions, 441
 - LDAPAttributes, 438
 - ldapattributes, 441
 - LDAPFilter, 438
 - ldapfilter, 441
 - LDAPScope, 439
 - ldapscope, 441
 - Locations, 439
 - locations, 441
 - MetaDataOption, 439
 - MetaDataOptions, 439
 - metadataoptions, 441
 - operator bool, 439
 - operator<, 439
 - operator<<, 441
 - operator==, 439
 - Option, 439
 - Options, 439
 - OptionString, 440
 - ParseOptions, 440
 - Passwd, 440
 - passwd, 441
 - Path, 440
 - path, 441
 - Path2BaseDN, 440
 - Port, 440
 - port, 441
 - Protocol, 440
 - protocol, 442
 - Scope, 436
 - str, 440
 - URL, 436
 - urloptions, 442
 - Username, 440
 - username, 442
 - valid, 442
- Arc::URLLocation, 443
 - ~URLLocation, 444
 - fullstr, 444
 - Name, 444
 - name, 444
 - str, 444
 - URLLocation, 443, 444
- Arc::URLMap, 445
- Arc::User, 446
- Arc::UserConfig, 447
- Arc::UsernameToken, 448
 - Authenticate, 449
 - operator bool, 449
 - PasswordType, 448
 - Username, 449
 - UsernameToken, 448, 449
- Arc::UserSwitch, 450
- Arc::VOMSTrustList, 451
 - AddChain, 452
 - AddRegex, 452
 - VOMSTrustList, 451
- Arc::WSAEndpointReference, 453
 - ~WSAEndpointReference, 453
 - Address, 454
 - MetaData, 454
 - operator XMLNode, 454
 - operator=, 454
 - ReferenceParameters, 454
 - WSAEndpointReference, 453
- Arc::WSAHeader, 455
 - Action, 456
 - Check, 456
 - FaultTo, 456

- From, 456
- header_allocated_, 457
- MessageID, 456
- NewReferenceParameter, 456
- operator XMLNode, 456
- ReferenceParameter, 456
- RelatesTo, 457
- RelationshipType, 457
- ReplyTo, 457
- To, 457
- WSAHeader, 455
- Arc::WSRF, 458
 - allocated_, 459
 - operator bool, 459
 - set_namespaces, 459
 - SOAP, 459
 - valid_, 459
 - WSRF, 459
- Arc::WSRFBBaseFault, 460
 - set_namespaces, 460
 - WSRFBBaseFault, 460
- Arc::WSRFResourceUnavailableFault, 461
- Arc::WSRFResourceUnknownFault, 462
- Arc::WSRP, 463
 - set_namespaces, 464
 - WSRP, 464
- Arc::WSRPDeleteResourceProperties, 465
- Arc::WSRPDeleteResourcePropertiesRequest, 466
- Arc::WSRPDeleteResourcePropertiesRequestFailedFault, 467
- Arc::WSRPDeleteResourcePropertiesResponse, 468
- Arc::WSRPFault, 469
 - WSRPFault, 469
- Arc::WSRPGetMultipleResourcePropertiesRequest, 470
- Arc::WSRPGetMultipleResourcePropertiesResponse, 471
- Arc::WSRPGetResourcePropertyDocumentRequest, 472
- Arc::WSRPGetResourcePropertyDocumentResponse, 473
- Arc::WSRPGetResourcePropertyRequest, 474
- Arc::WSRPGetResourcePropertyResponse, 475
- Arc::WSRPInsertResourceProperties, 476
- Arc::WSRPInsertResourcePropertiesRequest, 477
- Arc::WSRPInsertResourcePropertiesRequestFailedFault, 478
- Arc::WSRPInsertResourcePropertiesResponse, 479
- Arc::WSRPInvalidModificationFault, 480
- Arc::WSRPInvalidResourcePropertyQNameFault, 481
- Arc::WSRPModifyResourceProperties, 482
- Arc::WSRPPutResourcePropertyDocumentRequest, 483
- Arc::WSRPPutResourcePropertyDocumentResponse, 484
- Arc::WSRPQueryResourcePropertiesRequest, 485
- Arc::WSRPQueryResourcePropertiesResponse, 486
- Arc::WSRPResourcePropertyChangeFailure, 487
 - WSRPResourcePropertyChangeFailure, 487
- Arc::WSRPSetResourcePropertiesRequest, 488
- Arc::WSRPSetResourcePropertiesResponse, 489
- Arc::WSRPSetResourcePropertyRequestFailedFault, 490
- Arc::WSRPUnableToModifyResourcePropertyFault, 491
- Arc::WSRPUnableToPutResourcePropertyDocumentFault, 492
- Arc::WSRPUpdateResourceProperties, 493
- Arc::WSRPUpdateResourcePropertiesRequest, 494
- Arc::WSRPUpdateResourcePropertiesRequestFailedFault, 495
- Arc::WSRPUpdateResourcePropertiesResponse, 496
- Arc::X509Token, 498
 - ~X509Token, 499
 - Authenticate, 499
 - operator bool, 499
 - X509Token, 498
 - X509TokenType, 498
- Arc::XmlContainer, 500
- Arc::XmlDatabase, 501
- Arc::XMLNode, 502
 - ~XMLNode, 504
 - Attribute, 504, 505
 - AttributesSize, 505
 - Child, 505
 - Destroy, 505
 - FullName, 505
 - Get, 505
 - GetDoc, 505
 - GetRoot, 505
 - GetXML, 505, 506
 - is_owner_, 511
 - is_temporary_, 511
 - Name, 506
 - Namespace, 506
 - NamespacePrefix, 506
 - Namespaces, 506
 - New, 506
 - NewAttribute, 507
 - NewChild, 507
 - operator bool, 507
 - operator std::string, 508
 - operator++, 508

- operator--, 508
- operator=, 508, 509
- operator==, 509
- operator[], 509
- Parent, 509
- Path, 510
- Prefix, 510
- ReadFromFile, 510
- ReadFromStream, 510
- Replace, 510
- Same, 510
- SaveToFile, 510
- SaveToStream, 510
- Set, 510
- Size, 510
- XMLNode, 504
- XPathLookup, 511
- Arc::XMLNodeContainer, 512
 - Add, 512
 - AddNew, 512
 - Nodes, 513
 - operator=, 513
 - operator[], 513
 - Size, 513
 - XMLNodeContainer, 512
- Arc::XMLSecNode, 514
 - AddSignatureTemplate, 514
 - DecryptNode, 514
 - EncryptNode, 515
 - SignNode, 515
 - VerifyNode, 515
 - XMLSecNode, 514
- Arc::XRSLParser, 516
- ArcCredential, 42
 - CERT_TYPE_CA, 43
 - CERT_TYPE_EEC, 43
 - CERT_TYPE_GSI_2_LIMITED_PROXY, 43
 - CERT_TYPE_GSI_2_PROXY, 43
 - CERT_TYPE_GSI_3_IMPERSONATION_PROXY, 43
 - CERT_TYPE_GSI_3_INDEPENDENT_PROXY, 43
 - CERT_TYPE_GSI_3_LIMITED_PROXY, 43
 - CERT_TYPE_GSI_3_RESTRICTED_PROXY, 43
 - CERT_TYPE_RFC_ANYLANGUAGE_PROXY, 43
 - CERT_TYPE_RFC_IMPERSONATION_PROXY, 43
 - CERT_TYPE_RFC_INDEPENDENT_PROXY, 43
 - CERT_TYPE_RFC_LIMITED_PROXY, 43
 - CERT_TYPE_RFC_RESTRICTED_PROXY, 43
- certType, 43
- ArcCredential::ACACI, 45
- ArcCredential::ACATTHOLDER, 46
- ArcCredential::ACATTR, 47
- ArcCredential::ACATTRIBUTE, 48
- ArcCredential::ACC, 49
- ArcCredential::ACCERTS, 50
- ArcCredential::ACDIGEST, 51
- ArcCredential::ACFORM, 52
- ArcCredential::ACFULLATTRIBUTES, 53
- ArcCredential::ACHOLDER, 54
- ArcCredential::ACIETFATTR, 55
- ArcCredential::ACINFO, 56
- ArcCredential::ACIS, 57
- ArcCredential::ACSEQ, 58
- ArcCredential::ACTARGET, 59
- ArcCredential::ACTARGETS, 60
- ArcCredential::ACVAL, 61
- ArcCredential::cert_verify_context, 94
- ArcCredential::PROXYCERTINFO_st, 354
- ArcCredential::PROXYPOLICY_st, 355
- ArcSec::AlgFactory, 63
 - createAlg, 63
- ArcSec::AnyURIAttribute, 64
 - encode, 64
 - getId, 64
 - getType, 64
- ArcSec::ArcPeriod, 69
- ArcSec::Attr, 71
- ArcSec::AttributeFactory, 72
- ArcSec::AttributeProxy, 76
 - getAttribute, 76
- ArcSec::AttributeValue, 77
 - encode, 78
 - equal, 78
 - getId, 78
 - getType, 78
- ArcSec::Attrs, 79
- ArcSec::AuthzRequest, 80
- ArcSec::AuthzRequestSection, 81
- ArcSec::BooleanAttribute, 86
 - encode, 86
 - getId, 86
 - getType, 86
- ArcSec::CombiningAlg, 111
 - combine, 111
 - getalgId, 111
- ArcSec::DateAttribute, 175
 - encode, 175
 - getId, 175
 - getType, 175
- ArcSec::DateTimeAttribute, 176
 - encode, 176
 - getId, 176

- getType, 176
- ArcSec::DenyOverridesCombiningAlg, 187
 - combine, 187
 - getalgId, 187
- ArcSec::DurationAttribute, 197
 - encode, 197
 - getId, 197
 - getType, 197
- ArcSec::EqualFunction, 198
 - evaluate, 198
 - getFunctionName, 198
- ArcSec::EvalResult, 200
- ArcSec::EvaluationCtx, 201
 - EvaluationCtx, 201
- ArcSec::Evaluator, 202
 - addPolicy, 202
 - evaluate, 202, 203
 - getAlgFactory, 203
 - getAttrFactory, 203
 - getFnFactory, 204
 - getName, 204
 - setCombiningAlg, 204
- ArcSec::EvaluatorContext, 205
 - operator AlgFactory *, 205
 - operator AttributeFactory *, 205
 - operator FnFactory *, 205
- ArcSec::EvaluatorLoader, 206
 - getEvaluator, 206
 - getPolicy, 206
 - getRequest, 206, 207
- ArcSec::FnFactory, 222
 - createFn, 222
- ArcSec::Function, 223
 - evaluate, 223
- ArcSec::GenericAttribute, 224
 - encode, 224
 - getId, 224
 - getType, 224
- ArcSec::InRangeFunction, 243
 - evaluate, 243
- ArcSec::MatchFunction, 272
 - evaluate, 272
 - getFunctionName, 272
- ArcSec::OrderedCombiningAlg, 309
- ArcSec::PDP, 328
- ArcSec::PDPCfgContext, 329
- ArcSec::PDPPluginArgument, 330
- ArcSec::PeriodAttribute, 333
 - encode, 333
 - getId, 333
 - getType, 333
- ArcSec::PermitOverridesCombiningAlg, 334
 - combine, 334
 - getalgId, 334
- ArcSec::Policy, 345
 - addPolicy, 346
 - eval, 346
 - getEffect, 346
 - getEvalName, 346
 - getEvalResult, 346
 - getName, 346
 - make_policy, 346
 - Policy, 345
 - setEvalResult, 346
 - setEvaluatorContext, 346
- ArcSec::PolicyParser, 349
 - parsePolicy, 349
- ArcSec::PolicyStore, 350
 - PolicyStore, 350
- ArcSec::PolicyStore::PolicyElement, 348
- ArcSec::Request, 363
 - addRequestItem, 364
 - getEvalName, 364
 - getName, 364
 - getRequestItems, 364
 - make_request, 364
 - Request, 363
 - setAttributeFactory, 364
 - setRequestItems, 364
- ArcSec::RequestAttribute, 365
 - duplicate, 365
 - RequestAttribute, 365
- ArcSec::RequestItem, 366
 - RequestItem, 366
- ArcSec::RequestTuple, 367
- ArcSec::Response, 371
- ArcSec::ResponseItem, 372
- ArcSec::ResponseList, 373
- ArcSec::SecHandler, 399
- ArcSec::SecHandlerConfig, 400
- ArcSec::SecHandlerPluginArgument, 402
- ArcSec::Security, 403
- ArcSec::Source, 415
 - Source, 415
- ArcSec::SourceFile, 416
- ArcSec::SourceURL, 417
- ArcSec::StringAttribute, 418
 - encode, 418
 - getId, 418
 - getType, 418
- ArcSec::TimeAttribute, 434
 - encode, 434
 - getId, 434
 - getType, 434
- ArcSec::X500NameAttribute, 497
 - encode, 497
 - getId, 497
 - getType, 497

- Assign
 - Arc::InformationContainer, 236
- AssignStderr
 - Arc::Run, 385
- AssignStdin
 - Arc::Run, 385
- AssignStdout
 - Arc::Run, 385
- AssignWorkingDirectory
 - Arc::Run, 385
- AttrConstIter
 - Arc, 34
- Attribute
 - Arc::XMLNode, 504, 505
- AttributeIterator
 - Arc::AttributeIterator, 73
- Attributes
 - Arc::Message, 287
 - Arc::SOAPMessage, 410
- attributes_
 - Arc::MessageAttributes, 291
- AttributesSize
 - Arc::XMLNode, 505
- AttrIter
 - Arc, 34
- AttrMap
 - Arc, 35
- Auth
 - Arc::Message, 287
- AuthContext
 - Arc::Message, 287
- Authenticate
 - Arc::SAMLToken, 393
 - Arc::UsernameToken, 449
 - Arc::X509Token, 499
- Backup
 - Arc::DelegationConsumer, 179
- BaseDN2Path
 - Arc::URL, 437
- broadcast
 - Arc::SimpleCondition, 408
- BrokerLoader
 - Arc::BrokerLoader, 89
- Buffer
 - Arc::PayloadRaw, 313
 - Arc::PayloadRawInterface, 317
- buffer_size
 - Arc::DataBuffer, 141
- BufferPos
 - Arc::PayloadRaw, 314
 - Arc::PayloadRawInterface, 317
- BufferSize
 - Arc::PayloadRaw, 314
- Arc::PayloadRawInterface, 317
- BUSY_ERROR
 - Arc, 35
- CacheError
 - Arc::DataStatus, 171
- cancel
 - Arc::Counter, 121
 - Arc::CounterTicket, 126
 - Arc::IntraProcessCounter, 245
- CERT_TYPE_CA
 - ArcCredential, 43
- CERT_TYPE_EEC
 - ArcCredential, 43
- CERT_TYPE_GSI_2_LIMITED_PROXY
 - ArcCredential, 43
- CERT_TYPE_GSI_2_PROXY
 - ArcCredential, 43
- CERT_TYPE_GSI_3_IMPERSONATION_-
 - PROXY
 - ArcCredential, 43
- CERT_TYPE_GSI_3_INDEPENDENT_PROXY
 - ArcCredential, 43
- CERT_TYPE_GSI_3_LIMITED_PROXY
 - ArcCredential, 43
- CERT_TYPE_GSI_3_RESTRICTED_PROXY
 - ArcCredential, 43
- CERT_TYPE_RFC_ANYLANGUAGE_PROXY
 - ArcCredential, 43
- CERT_TYPE_RFC_IMPERSONATION_PROXY
 - ArcCredential, 43
- CERT_TYPE_RFC_INDEPENDENT_PROXY
 - ArcCredential, 43
- CERT_TYPE_RFC_LIMITED_PROXY
 - ArcCredential, 43
- CERT_TYPE_RFC_RESTRICTED_PROXY
 - ArcCredential, 43
- certType
 - ArcCredential, 43
- changeExcess
 - Arc::Counter, 121
 - Arc::IntraProcessCounter, 245
- ChangeHost
 - Arc::URL, 437
- ChangeLDAPFilter
 - Arc::URL, 437
- ChangeLDAPScope
 - Arc::URL, 437
- changeLimit
 - Arc::Counter, 121
 - Arc::IntraProcessCounter, 245
- ChangePath
 - Arc::URL, 437
- ChangePort

- Arc::URL, 437
- ChangeProtocol
 - Arc::URL, 437
- Check
 - Arc::DataPoint, 153
 - Arc::DataPointIndex, 163
 - Arc::WSAHeader, 456
- CheckCreated
 - Arc::FileCache, 214
- CheckDN
 - Arc::FileCache, 214
- CheckError
 - Arc::DataStatus, 172
- checks
 - Arc::DataMover, 148
- checksum_object
 - Arc::DataBuffer, 141
- checksum_valid
 - Arc::DataBuffer, 142
- CheckValid
 - Arc::FileCache, 214
- Child
 - Arc::XMLNode, 505
- CISStringValue
 - Arc::CISStringValue, 98
- Clean
 - Arc::FileCache, 214
- ClientHTTPwithSAML2SSO
 - Arc::ClientHTTPwithSAML2SSO, 103
- ClientSOAP
 - Arc::ClientSOAP, 105
- ClientSOAPwithSAML2SSO
 - Arc::ClientSOAPwithSAML2SSO, 107
- ClientX509Delegation
 - Arc::ClientX509Delegation, 109
- close
 - Arc::Database, 139
 - Arc::MySQLDatabase, 300
- CloseStderr
 - Arc::Run, 385
- CloseStdin
 - Arc::Run, 385
- CloseStdout
 - Arc::Run, 385
- combine
 - ArcSec::CombiningAlg, 111
 - ArcSec::DenyOverridesCombiningAlg, 187
 - ArcSec::PermitOverridesCombiningAlg, 334
- CommonLocOption
 - Arc::URL, 437
- CommonLocOptions
 - Arc::URL, 438
- commonlocoptions
 - Arc::URL, 441
- CompareMeta
 - Arc::DataPoint, 153
- ComparisonOperator
 - Arc::Software, 412
- Config
 - Arc::Config, 113, 114
- ConfusaCertHandler
 - Arc::ConfusaCertHandler, 115
- connect
 - Arc::Database, 139
 - Arc::MySQLDatabase, 300
- ConnectionURL
 - Arc::URL, 438
- Content
 - Arc::PayloadRaw, 314
 - Arc::PayloadRawInterface, 318
- ContentFromPayload
 - Arc, 36
- Context
 - Arc::Message, 287
- context_lock_
 - Arc::DelegationContainerSOAP, 182
- Copy
 - Arc::FileCache, 214
- count
 - Arc::MessageAttributes, 290
- Counter
 - Arc::Counter, 121
- CounterTicket
 - Arc::CounterTicket, 126
- createAlg
 - ArcSec::AlgFactory, 63
- createCertRequest
 - Arc::ConfusaCertHandler, 115
- createDelegation
 - Arc::ClientX509Delegation, 109
- createFn
 - ArcSec::FnFactory, 222
- CreateThreadFunction
 - Arc, 36
- createVOMSAC
 - Arc, 36
- Credential
 - Arc::Credential, 130, 131
- CredentialError
 - Arc::CredentialError, 137
- CredentialLogger
 - Arc, 40
- CredentialsExpiredError
 - Arc::DataStatus, 172
- current_
 - Arc::AttributeIterator, 75
- CurrentLocationMetadata
 - Arc::DataPoint, 153

- Arc::DataPointDirect, 159
- Arc::DataPointIndex, 163
- Database
 - Arc::Database, 138
- DataBuffer
 - Arc::DataBuffer, 141
- DataSpeed
 - Arc::DataSpeed, 167
- DataStatusType
 - Arc::DataStatus, 171
- DecryptNode
 - Arc::XMLSecNode, 514
- Delegate
 - Arc::DelegationProvider, 184
- DelegateCredentialsInit
 - Arc::DelegationConsumerSOAP, 180
 - Arc::DelegationContainerSOAP, 182
 - Arc::DelegationProviderSOAP, 186
- DelegatedToken
 - Arc::DelegationConsumerSOAP, 180
 - Arc::DelegationContainerSOAP, 182
 - Arc::DelegationProviderSOAP, 186
- DelegationConsumer
 - Arc::DelegationConsumer, 178
- DelegationConsumerSOAP
 - Arc::DelegationConsumerSOAP, 180
- DelegationProvider
 - Arc::DelegationProvider, 184
- DelegationProviderSOAP
 - Arc::DelegationProviderSOAP, 185
- DeleteError
 - Arc::DataStatus, 172
- Destroy
 - Arc::XMLNode, 505
- destroy_doc
 - Arc::ConfusaParserUtils, 116
- DMCLoader
 - Arc::DMCLoader, 194
- doc_
 - Arc::InformationContainer, 237
- duplicate
 - ArcSec::RequestAttribute, 365
- enable_ssl
 - Arc::Database, 139
 - Arc::MySQLDatabase, 300
- encode
 - ArcSec::AnyURIAttribute, 64
 - ArcSec::AttributeValue, 78
 - ArcSec::BooleanAttribute, 86
 - ArcSec::DateAttribute, 175
 - ArcSec::DateTimeAttribute, 176
 - ArcSec::DurationAttribute, 197
 - ArcSec::GenericAttribute, 224
 - ArcSec::PeriodAttribute, 333
 - ArcSec::StringAttribute, 418
 - ArcSec::TimeAttribute, 434
 - ArcSec::X500NameAttribute, 497
- EncryptNode
 - Arc::XMLSecNode, 515
- end_
 - Arc::AttributeIterator, 75
- eof_read
 - Arc::DataBuffer, 142
- eof_write
 - Arc::DataBuffer, 142
- equal
 - Arc::CStringValue, 98
 - ArcSec::AttributeValue, 78
- error
 - Arc::DataBuffer, 142
- error_read
 - Arc::DataBuffer, 142
- error_write
 - Arc::DataBuffer, 142
- eval
 - ArcSec::Policy, 346
- evaluate
 - ArcSec::EqualFunction, 198
 - ArcSec::Evaluator, 202, 203
 - ArcSec::Function, 223
 - ArcSec::InRangeFunction, 243
 - ArcSec::MatchFunction, 272
- evaluate_path
 - Arc::ConfusaParserUtils, 116
- EvaluationCtx
 - ArcSec::EvaluationCtx, 201
- execute
 - Arc::MySQLQuery, 302
 - Arc::Query, 356
- Export
 - Arc::MessageAuth, 292
 - Arc::MultiSecAttr, 299
 - Arc::SecAttr, 395
- extend
 - Arc::Counter, 122
 - Arc::CounterTicket, 126
 - Arc::IntraProcessCounter, 245
- extract_body_information
 - Arc::ConfusaParserUtils, 116
- factory_
 - Arc::Loader, 263
- FaultTo
 - Arc::WSAHeader, 456
- File
 - Arc::FileCache, 214

- FileCache
 - Arc::FileCache, 213
- FileCacheHash, 217
 - getHash, 217
 - maxLength, 217
- Filter
 - Arc::InfoFilter, 231
 - Arc::MessageAuth, 292
- final_xmlsec
 - Arc, 36
- findLocation
 - Arc::ModuleManager, 297
- findSimpleSAMLInstallation
 - Arc::SAML2LoginClient, 388
- for_read
 - Arc::DataBuffer, 143
- for_write
 - Arc::DataBuffer, 143
- force_to_meta
 - Arc::DataMover, 148
- From
 - Arc::WSAHeader, 456
- FullName
 - Arc::XMLNode, 505
- FullPath
 - Arc::URL, 438
- fullstr
 - Arc::URL, 438
 - Arc::URLLocation, 444
- Generate
 - Arc::DelegationConsumer, 179
- GenerateEECRequest
 - Arc::Credential, 131, 132
- GenerateRequest
 - Arc::Credential, 132
- GENERIC_ERROR
 - Arc, 35
- Get
 - Arc::InfoCacheInterface, 230
 - Arc::InformationContainer, 236
 - Arc::InformationInterface, 238
 - Arc::PayloadStream, 321
 - Arc::PayloadStreamInterface, 324
 - Arc::XMLNode, 505
- get
 - Arc::MessageAttributes, 290
- get_array
 - Arc::MySQLQuery, 302
 - Arc::Query, 357
- get_cert_str
 - Arc, 36
- get_doc
 - Arc::ConfusaParserUtils, 116
- get_factory
 - Arc::PluginArgument, 340
- get_instance
 - Arc::PluginsFactory, 343
- get_key_from_certfile
 - Arc, 37
- get_key_from_certstr
 - Arc, 37
- get_key_from_keyfile
 - Arc, 37
- get_key_from_keystr
 - Arc, 37
- get_module
 - Arc::PluginArgument, 340
- get_node
 - Arc, 37
- get_num_columns
 - Arc::MySQLQuery, 302
 - Arc::Query, 357
- get_num_rows
 - Arc::MySQLQuery, 302
 - Arc::Query, 357
- get_plugin_instance
 - Arc, 35
- get_row
 - Arc::MySQLQuery, 303
 - Arc::Query, 357
- get_row_field
 - Arc::MySQLQuery, 303
 - Arc::Query, 357
- getAlgFactory
 - ArcSec::Evaluator, 203
- getalgId
 - ArcSec::CombiningAlg, 111
 - ArcSec::DenyOverridesCombiningAlg, 187
 - ArcSec::PermitOverridesCombiningAlg, 334
- getAll
 - Arc::MessageAttributes, 290
- getAttrFactory
 - ArcSec::Evaluator, 203
- getAttribute
 - ArcSec::AttributeProxy, 76
- GetBestTarget
 - Arc::Broker, 87
- GetBrokers
 - Arc::BrokerLoader, 89
- GetCert
 - Arc::Credential, 132
- GetCertNumofChain
 - Arc::Credential, 132
- GetCertReq
 - Arc::Credential, 132
- getCertRequestB64
 - Arc::ConfusaCertHandler, 115

- getCounterTicket
 - Arc::Counter, 122
- GetCreated
 - Arc::FileCache, 215
- getCurrentTime
 - Arc::Counter, 122
- GetDN
 - Arc::Credential, 132
- GetDoc
 - Arc::XMLNode, 505
- getEffect
 - ArcSec::Policy, 346
- GetEndTime
 - Arc::Credential, 132
- GetEntry
 - Arc::ClientSOAP, 105
- getEvalName
 - ArcSec::Policy, 346
 - ArcSec::Request, 364
- getEvalResult
 - ArcSec::Policy, 346
- getEvaluator
 - ArcSec::EvaluatorLoader, 206
- getExcess
 - Arc::Counter, 123
 - Arc::IntraProcessCounter, 246
- getExpirationReminder
 - Arc::Counter, 123
- getExpiryTime
 - Arc::Counter, 123
 - Arc::ExpirationReminder, 211
- getExplanation
 - Arc::MCC_Status, 277
- GetFailureReason
 - Arc::DataPoint, 153
- getFileName
 - Arc::Config, 114
- getFnFactory
 - ArcSec::Evaluator, 204
- GetFormat
 - Arc::Time, 432
- getFormat
 - Arc::Credential, 133
- getFunctionName
 - ArcSec::EqualFunction, 198
 - ArcSec::MatchFunction, 272
- getHash
 - FileCacheHash, 217
- getID
 - Arc::Service, 405
- getId
 - ArcSec::AnyURIAttribute, 64
 - ArcSec::AttributeValue, 78
 - ArcSec::BooleanAttribute, 86
 - ArcSec::DateAttribute, 175
 - ArcSec::DateTimeAttribute, 176
 - ArcSec::DurationAttribute, 197
 - ArcSec::GenericAttribute, 224
 - ArcSec::PeriodAttribute, 333
 - ArcSec::StringAttribute, 418
 - ArcSec::TimeAttribute, 434
 - ArcSec::X500NameAttribute, 497
- GetIdentityName
 - Arc::Credential, 133
- GetJobControllers
 - Arc::JobControllerLoader, 253
- getKind
 - Arc::MCC_Status, 277
- getLevel
 - Arc::LogMessage, 269
- GetLifeTime
 - Arc::Credential, 133
- getLimit
 - Arc::Counter, 123
 - Arc::IntraProcessCounter, 246
- getName
 - ArcSec::Evaluator, 204
 - ArcSec::Policy, 346
 - ArcSec::Request, 364
- getOrigin
 - Arc::MCC_Status, 278
- GetOverlay
 - Arc::BaseConfig, 85
- GetPeriod
 - Arc::Period, 331
- GetPlugins
 - Arc::ArcLocation, 68
- getPolicy
 - ArcSec::EvaluatorLoader, 206
- GetPrivKey
 - Arc::Credential, 133
- GetProxyPolicy
 - Arc::Credential, 133
- GetPubKey
 - Arc::Credential, 133
- getRequest
 - ArcSec::EvaluatorLoader, 206, 207
- getRequestItems
 - ArcSec::Request, 364
- getReservationID
 - Arc::ExpirationReminder, 211
- GetRoot
 - Arc::XMLNode, 505
- getRootLogger
 - Arc::Logger, 266
- GetStartTime
 - Arc::Credential, 133
- GetSubmitters

- Arc::SubmitterLoader, 420
- GetTargetRetrievers
 - Arc::TargetRetrieverLoader, 425
- getThreshold
 - Arc::Logger, 266
- GetTime
 - Arc::Time, 432
- GetType
 - Arc::Credential, 133
- getType
 - ArcSec::AnyURIAttribute, 64
 - ArcSec::AttributeValue, 78
 - ArcSec::BooleanAttribute, 86
 - ArcSec::DateAttribute, 175
 - ArcSec::DateTimeAttribute, 176
 - ArcSec::DurationAttribute, 197
 - ArcSec::GenericAttribute, 224
 - ArcSec::PeriodAttribute, 333
 - ArcSec::StringAttribute, 418
 - ArcSec::TimeAttribute, 434
 - ArcSec::X500NameAttribute, 497
- GetValid
 - Arc::FileCache, 215
- getValue
 - Arc::Counter, 124
 - Arc::IntraProcessCounter, 246
- GetXML
 - Arc::XMLNode, 505, 506
- handle_
 - Arc::PayloadStream, 322
- handle_redirect_step
 - Arc::ConfusaParserUtils, 116
- hasMore
 - Arc::AttributeIterator, 74
- header_allocated_
 - Arc::WSAHeader, 457
- hold
 - Arc::DataSpeed, 168
- Host
 - Arc::URL, 438
- host
 - Arc::URL, 441
- HTTPOption
 - Arc::URL, 438
- HTTPOptions
 - Arc::URL, 438
- httpoptions
 - Arc::URL, 441
- ID
 - Arc::DelegationConsumer, 179
 - Arc::DelegationProviderSOAP, 186
- IDType
 - Arc::Counter, 121
- Import
 - Arc::SecAttr, 396
- InfoCache
 - Arc::InfoCache, 229
- InfoFilter
 - Arc::InfoFilter, 231
- InfoRegisters
 - Arc::InfoRegisters, 234
- InformationContainer
 - Arc::InformationContainer, 236
- InformationInterface
 - Arc::InformationInterface, 238
- InformationRequest
 - Arc::InformationRequest, 240
- InformationResponse
 - Arc::InformationResponse, 241
- Init
 - Arc::ArcLocation, 68
- init_xmlsec
 - Arc, 37
- InitProxyCertInfo
 - Arc::Credential, 133
- InquireRequest
 - Arc::Credential, 133, 134
- Insert
 - Arc::PayloadRaw, 314
 - Arc::PayloadRawInterface, 318
- IntraProcessCounter
 - Arc::IntraProcessCounter, 244
- is_notwritten
 - Arc::DataBuffer, 143
- is_owner_
 - Arc::XMLNode, 511
- is_read
 - Arc::DataBuffer, 144
- is_temporary_
 - Arc::XMLNode, 511
- is_written
 - Arc::DataBuffer, 144
- isconnected
 - Arc::Database, 139
 - Arc::MySQLDatabase, 301
- isOk
 - Arc::MCC_Status, 278
- IsReadingError
 - Arc::DataStatus, 172
- isSatisfied
 - Arc::SoftwareRequirement, 414
- istr
 - Arc::Period, 331
- isValid
 - Arc::CounterTicket, 127
- IsWritingError

- Arc::DataStatus, 172
- JobControllerLoader
 - Arc::JobControllerLoader, 253
- KeepStderr
 - Arc::Run, 385
- KeepStdin
 - Arc::Run, 385
- KeepStdout
 - Arc::Run, 385
- key
 - Arc::AttributeIterator, 74
- Kill
 - Arc::Run, 385
- LDAPAttributes
 - Arc::URL, 438
- ldapattributes
 - Arc::URL, 441
- LDAPFilter
 - Arc::URL, 438
- ldapfilter
 - Arc::URL, 441
- LDAPScope
 - Arc::URL, 439
- ldapscope
 - Arc::URL, 441
- length
 - Arc::PayloadRawBuf, 316
- Link
 - Arc::FileCache, 215
- ListError
 - Arc::DataStatus, 172
- ListFiles
 - Arc::DataPoint, 153
- Load
 - Arc::ClientSOAP, 106
- load
 - Arc::BrokerLoader, 89
 - Arc::JobControllerLoader, 253
 - Arc::ModuleManager, 297
 - Arc::PluginsFactory, 343
 - Arc::SubmitterLoader, 420
 - Arc::TargetRetrieverLoader, 425
- load_key_from_certfile
 - Arc, 37
- load_key_from_certstr
 - Arc, 37
- load_key_from_keyfile
 - Arc, 37
- load_trusted_cert_file
 - Arc, 37
- load_trusted_cert_str
 - Arc, 38
- load_trusted_certs
 - Arc, 38
- Loader
 - Arc::Loader, 263
- LocationAlreadyExistsError
 - Arc::DataStatus, 172
- Locations
 - Arc::URL, 439
- locations
 - Arc::URL, 441
- lock
 - Arc::SimpleCondition, 408
- lock_
 - Arc::InformationInterface, 239
- log
 - Arc::LogStream, 270
- LogDestination
 - Arc::LogDestination, 264
- LogError
 - Arc::Credential, 134
 - Arc::DelegationConsumer, 179
- Logger
 - Arc::Logger, 265
 - Arc::LogMessage, 269
- logger
 - Arc::MCC, 276
 - Arc::Plexer, 337
 - Arc::Service, 405
- LogLevel
 - Arc, 35
- LogMessage
 - Arc::LogMessage, 268
- LogStream
 - Arc::LogStream, 270
- make_policy
 - ArcSec::Policy, 346
- make_request
 - ArcSec::Request, 364
- MakeConfig
 - Arc::BaseConfig, 85
 - Arc::DMCCConfig, 193
 - Arc::MCCConfig, 279
- makePersistent
 - Arc::ModuleManager, 298
- match
 - Arc::RegularExpression, 362
- MatchXMLName
 - Arc, 38
- MatchXMLNamespace
 - Arc, 38
- max_duration_
 - Arc::DelegationContainerSOAP, 182

- max_size_
 - Arc::DelegationContainerSOAP, 183
- max_usage_
 - Arc::DelegationContainerSOAP, 183
- MaxDiskSpace
 - Arc::ExecutionTarget, 209
- maxLength
 - FileCacheHash, 217
- MaxMainMemory
 - Arc::ExecutionTarget, 209
- MaxVirtualMemory
 - Arc::ExecutionTarget, 209
- MCC
 - Arc::MCC, 275
- MCC_Status
 - Arc::MCC_Status, 277
- MCCLoader
 - Arc::MCCLoader, 281
- Message
 - Arc::Message, 287
- MessageAttributes
 - Arc::AttributeIterator, 75
 - Arc::MessageAttributes, 289
- MessageID
 - Arc::WSAHeader, 456
- MetaData
 - Arc::WSAEndpointReference, 454
- MetaDataOption
 - Arc::URL, 439
- MetaDataOptions
 - Arc::URL, 439
- metadatoptions
 - Arc::URL, 441
- ModuleManager
 - Arc::ModuleManager, 297
- msg
 - Arc::Logger, 266
- Name
 - Arc::URLLocation, 444
 - Arc::XMLNode, 506
- name
 - Arc::URLLocation, 444
- Namespace
 - Arc::XMLNode, 506
- NamespacePrefix
 - Arc::XMLNode, 506
- Namespaces
 - Arc::XMLNode, 506
- New
 - Arc::XMLNode, 506
- NewAttribute
 - Arc::XMLNode, 507
- NewChild
 - Arc::XMLNode, 507
- NewReferenceParameter
 - Arc::WSAHeader, 456
- Next
 - Arc::MCC, 275
 - Arc::Plexer, 337
- next_
 - Arc::MCC, 276
- NextLocation
 - Arc::DataPoint, 153
 - Arc::DataPointDirect, 159
 - Arc::DataPointIndex, 163
- NextTry
 - Arc::DataPoint, 154
- Nodes
 - Arc::XMLNodeContainer, 513
- NoLocationError
 - Arc::DataStatus, 172
- NotInitializedError
 - Arc::DataStatus, 172
- NotSupportedForDirectDataPointsError
 - Arc::DataStatus, 172
- OAuthConsumer
 - Arc::OAuthConsumer, 305
- OpenSSLInit
 - Arc, 38
- OperatingSystem
 - Arc::ExecutionTarget, 209
- operator AlgFactory *
 - ArcSec::EvaluatorContext, 205
- operator AttributeFactory *
 - ArcSec::EvaluatorContext, 205
- operator bool
 - Arc::CStringValue, 98
 - Arc::FileCache, 215
 - Arc::MCC_Status, 278
 - Arc::MultiSecAttr, 299
 - Arc::PathIterator, 311
 - Arc::PayloadStream, 321
 - Arc::PayloadStreamInterface, 325
 - Arc::Run, 386
 - Arc::SAMLToken, 393
 - Arc::SecAttr, 396
 - Arc::SecAttrValue, 398
 - Arc::URL, 439
 - Arc::UsernameToken, 449
 - Arc::WSRF, 459
 - Arc::X509Token, 499
 - Arc::XMLNode, 507
- operator FnFactory *
 - ArcSec::EvaluatorContext, 205
- operator PluginsFactory *
 - Arc::ChainContext, 95

- operator std::string
 - Arc::MCC_Status, 278
 - Arc::Period, 331
 - Arc::Time, 432
 - Arc::XMLNode, 508
- operator XMLNode
 - Arc::WSAEndpointReference, 454
 - Arc::WSAHeader, 456
- operator<
 - Arc::ExpirationReminder, 211
 - Arc::Period, 332
 - Arc::Time, 432
 - Arc::URL, 439
- operator<<
 - Arc, 38, 39
 - Arc::LogMessage, 269
 - Arc::URL, 441
- operator<=
 - Arc::Period, 332
 - Arc::Time, 432
- operator>
 - Arc::Period, 332
 - Arc::Time, 433
- operator>=
 - Arc::Period, 332
 - Arc::Time, 433
- operator*
 - Arc::AttributeIterator, 74
 - Arc::PathIterator, 311
- operator+
 - Arc::Time, 432
- operator++
 - Arc::AttributeIterator, 74
 - Arc::PathIterator, 311
 - Arc::XMLNode, 508
- operator-
 - Arc::Time, 432
- operator->
 - Arc::AttributeIterator, 74
- operator--
 - Arc::PathIterator, 311
 - Arc::XMLNode, 508
- operator=
 - Arc::Message, 288
 - Arc::Period, 332
 - Arc::Time, 432, 433
 - Arc::WSAEndpointReference, 454
 - Arc::XMLNode, 508, 509
 - Arc::XMLNodeContainer, 513
- operator==
 - Arc::FileCache, 215
 - Arc::Period, 332
 - Arc::SecAttr, 396
 - Arc::SecAttrValue, 398
 - Arc::Software, 413
 - Arc::Time, 433
 - Arc::URL, 439
 - Arc::XMLNode, 509
- operator[]
 - Arc::MCCLoader, 281
 - Arc::PayloadRaw, 314
 - Arc::PayloadRawInterface, 318
 - Arc::XMLNode, 509
 - Arc::XMLNodeContainer, 513
- Option
 - Arc::URL, 439
- Options
 - Arc::URL, 439
- OptionString
 - Arc::URL, 440
- OutputCertificate
 - Arc::Credential, 134
- OutputCertificateChain
 - Arc::Credential, 134
- OutputPrivatekey
 - Arc::Credential, 134
- OutputPublickey
 - Arc::Credential, 134
- Parent
 - Arc::XMLNode, 509
- parse
 - Arc::Config, 114
- parseDN
 - Arc::OAuthConsumer, 305
 - Arc::SAML2SSOHTTPClient, 389
- ParseOptions
 - Arc::URL, 440
- parsePolicy
 - ArcSec::PolicyParser, 349
- parseVOMSAC
 - Arc, 39
- PARSING_ERROR
 - Arc, 35
- Passive
 - Arc::DataPoint, 154
 - Arc::DataPointDirect, 159
 - Arc::DataPointIndex, 163
- passphrase_callback
 - Arc, 40
- Passwd
 - Arc::URL, 440
- passwd, 310
 - Arc::URL, 441
- PasswordType
 - Arc::UsernameToken, 448
- Path
 - Arc::URL, 440

- Arc::XMLNode, 510
- path
 - Arc::URL, 441
- Path2BaseDN
 - Arc::URL, 440
- PathIterator
 - Arc::PathIterator, 311
- Payload
 - Arc::Message, 288
 - Arc::SOAPMessage, 410, 411
- PayloadRaw
 - Arc::PayloadRaw, 313
- PayloadSOAP
 - Arc::PayloadSOAP, 319
- PayloadStream
 - Arc::PayloadStream, 320
- PayloadWSRF
 - Arc::PayloadWSRF, 327
- Period
 - Arc::Period, 331
- Plexer
 - Arc::Plexer, 336
- plugins_table_name
 - Arc, 40
- PluginsFactory
 - Arc::PluginsFactory, 343
- Policy
 - ArcSec::Policy, 345
- PolicyStore
 - ArcSec::PolicyStore, 350
- Port
 - Arc::URL, 440
- port
 - Arc::URL, 441
- Pos
 - Arc::PayloadStream, 321
 - Arc::PayloadStreamInterface, 325
- PossibleTargets
 - Arc::Broker, 88
- PostRegister
 - Arc::DataPoint, 154
 - Arc::DataPointDirect, 159
- PostRegisterError
 - Arc::DataStatus, 171
- PreFilterTargets
 - Arc::Broker, 87
- Prefix
 - Arc::XMLNode, 510
- PreRegister
 - Arc::DataPoint, 154
 - Arc::DataPointDirect, 159
- PreRegisterError
 - Arc::DataStatus, 171
- PreUnregister
 - Arc::DataPoint, 154
 - Arc::DataPointDirect, 160
- print
 - Arc::Config, 114
- process
 - Arc::ClientHTTPwithSAML2SSO, 103
 - Arc::ClientSOAP, 106
 - Arc::ClientSOAPwithSAML2SSO, 107
 - Arc::MCC, 275
 - Arc::MCCInterface, 280
 - Arc::Plexer, 337
 - Test::TestService, 429
- processConsent
 - Arc::HakaClient, 227
 - Arc::OpenIdpClient, 307
 - Arc::SAML2SSOHTTPClient, 389
- processIdP2Confusa
 - Arc::HakaClient, 227
 - Arc::OpenIdpClient, 307
 - Arc::SAML2SSOHTTPClient, 389
- processIdPLogin
 - Arc::HakaClient, 227
 - Arc::OpenIdpClient, 307
 - Arc::SAML2SSOHTTPClient, 390
- processLogin
 - Arc::OAuthConsumer, 306
 - Arc::SAML2LoginClient, 388
 - Arc::SAML2SSOHTTPClient, 390
- ProcessSecHandlers
 - Arc::MCC, 275
 - Arc::Service, 405
- Protocol
 - Arc::URL, 440
- protocol
 - Arc::URL, 442
- PROTOCOL_RECOGNIZED_ERROR
 - Arc, 35
- ProvidesMeta
 - Arc::DataPoint, 155
 - Arc::DataPointDirect, 160
 - Arc::DataPointIndex, 163
- pushCSR
 - Arc::OAuthConsumer, 306
 - Arc::SAML2SSOHTTPClient, 390
- Put
 - Arc::PayloadStream, 321, 322
 - Arc::PayloadStreamInterface, 325
- Query
 - Arc::Query, 356
- Range
 - Arc::DataPoint, 155
 - Arc::DataPointDirect, 160

- Arc::DataPointIndex, 163
- RC_DEFAULT_PORT
 - URL.h, 518
- ReadAcquireError
 - Arc::DataStatus, 171
- ReadError
 - Arc::DataStatus, 171
- ReadFromFile
 - Arc::XMLNode, 510
- ReadFromStream
 - Arc::XMLNode, 510
- ReadOutOfOrder
 - Arc::DataPoint, 155
 - Arc::DataPointDirect, 160
 - Arc::DataPointIndex, 164
- ReadResolveError
 - Arc::DataStatus, 171
- ReadStartError
 - Arc::DataStatus, 171
- ReadStderr
 - Arc::Run, 386
- ReadStdout
 - Arc::Run, 386
- ReadStopError
 - Arc::DataStatus, 171
- ReferenceParameter
 - Arc::WSAHeader, 456
- ReferenceParameters
 - Arc::WSAEndpointReference, 454
- Registered
 - Arc::DataPoint, 155
 - Arc::DataPointDirect, 160
 - Arc::DataPointIndex, 164
- RegisteredService
 - Arc::RegisteredService, 361
- registration
 - Arc::InfoRegistrar, 235
- RegistrationCollector
 - Arc::Service, 405
- RelatesTo
 - Arc::WSAHeader, 457
- RelationshipType
 - Arc::WSAHeader, 457
- Release
 - Arc::FileCache, 215
- reload
 - Arc::ModuleManager, 298
- remove
 - Arc::MessageAttributes, 290
- removeAll
 - Arc::MessageAttributes, 291
- removeService
 - Arc::InfoRegisterContainer, 233
- Replace
 - Arc::XMLNode, 510
- ReplyTo
 - Arc::WSAHeader, 457
- Request
 - Arc::DelegationConsumer, 179
 - ArcSec::Request, 363
- RequestAttribute
 - ArcSec::RequestAttribute, 365
- RequestItem
 - ArcSec::RequestItem, 366
- reserve
 - Arc::Counter, 124
 - Arc::IntraProcessCounter, 246
- reset
 - Arc::SimpleCondition, 408
- Resolve
 - Arc::DataPoint, 155
 - Arc::DataPointDirect, 160
- Rest
 - Arc::PathIterator, 311
- Restore
 - Arc::DelegationConsumer, 179
- restricted_
 - Arc::DelegationContainerSOAP, 183
- Result
 - Arc::InformationResponse, 241
 - Arc::Run, 386
- Run
 - Arc::Run, 384
- Running
 - Arc::Run, 386
- Same
 - Arc::XMLNode, 510
- SAML2LoginClient
 - Arc::SAML2LoginClient, 388
- SAMLToken
 - Arc::SAMLToken, 392
- SAMLVersion
 - Arc::SAMLToken, 392
- save
 - Arc::Config, 114
- SaveToFile
 - Arc::XMLNode, 510
- SaveToStream
 - Arc::XMLNode, 510
- Scope
 - Arc::URL, 436
- sechandlers_
 - Arc::MCC, 276
 - Arc::Service, 405
- secure
 - Arc::DataMover, 149
- seekable_

- Arc::PayloadStream, 322
- Service
 - Arc::Service, 405
- SESSION_CLOSE
 - Arc, 35
- Set
 - Arc::XMLNode, 510
- set
 - Arc::DataBuffer, 144
 - Arc::MessageAttributes, 291
- set_base
 - Arc::DataSpeed, 168
- set_default_max_inactivity_time
 - Arc::DataMover, 149
- set_default_min_average_speed
 - Arc::DataMover, 149
- set_default_min_speed
 - Arc::DataMover, 149
- set_max_data
 - Arc::DataSpeed, 168
- set_max_inactivity_time
 - Arc::DataSpeed, 168
- set_min_average_speed
 - Arc::DataSpeed, 168
- set_min_speed
 - Arc::DataSpeed, 169
- set_namespaces
 - Arc::WSRF, 459
 - Arc::WSRFBaseFault, 460
 - Arc::WSRP, 464
- set_progress_indicator
 - Arc::DataSpeed, 169
- SetAdditionalChecks
 - Arc::DataPoint, 155
 - Arc::DataPointDirect, 161
 - Arc::DataPointIndex, 164
- setAttributeFactory
 - ArcSec::Request, 364
- setCfg
 - Arc::ModuleManager, 298
- setCombiningAlg
 - ArcSec::Evaluator, 204
- setEvalResult
 - ArcSec::Policy, 346
- setEvaluatorContext
 - ArcSec::Policy, 346
- setExcess
 - Arc::Counter, 124
 - Arc::IntraProcessCounter, 247
- setFileName
 - Arc::Config, 114
- SetFormat
 - Arc::Time, 433
- setIdentifier
 - Arc::LogMessage, 269
- SetLifeTime
 - Arc::Credential, 134
- setLimit
 - Arc::Counter, 124
 - Arc::IntraProcessCounter, 247
- SetMeta
 - Arc::DataPoint, 156
- SetPeriod
 - Arc::Period, 332
- SetProxyPolicy
 - Arc::Credential, 135
- setRequestItems
 - ArcSec::Request, 364
- setRequirement
 - Arc::SoftwareRequirement, 414
- SetSecure
 - Arc::DataPoint, 156
 - Arc::DataPointDirect, 161
 - Arc::DataPointIndex, 164
- SetStartTime
 - Arc::Credential, 135
- setThreshold
 - Arc::Logger, 267
- SetTime
 - Arc::Time, 433
- SetValid
 - Arc::FileCache, 215
- shutdown
 - Arc::Database, 139
 - Arc::MySQLDatabase, 301
- signal
 - Arc::SimpleCondition, 408
- signal_nonblock
 - Arc::SimpleCondition, 408
- SignEECRequest
 - Arc::Credential, 135
- SignNode
 - Arc::XMLSecNode, 515
- SignRequest
 - Arc::Credential, 135
- Size
 - Arc::PayloadRaw, 314
 - Arc::PayloadRawInterface, 318
 - Arc::PayloadStream, 322
 - Arc::PayloadStreamInterface, 325
 - Arc::XMLNode, 510
 - Arc::XMLNodeContainer, 513
- size
 - Arc::PayloadRawBuf, 316
- SOAP
 - Arc::InformationRequest, 240
 - Arc::WSRF, 459
- SOAPMessage

- Arc::SOAPMessage, 410
- Software
 - Arc::Software, 413
- SortTargets
 - Arc::Broker, 88
- Source
 - ArcSec::Source, 415
- STACK_OF
 - Arc::Credential, 136
- StageError
 - Arc::DataStatus, 172
- Start
 - Arc::FileCache, 216
 - Arc::Run, 386
- StartReading
 - Arc::DataPoint, 156
 - Arc::DataPointIndex, 164
- StartWriting
 - Arc::DataPoint, 156
 - Arc::DataPointIndex, 165
- STATUS_OK
 - Arc, 35
- StatusKind
 - Arc, 35
- Stop
 - Arc::FileCache, 216
- StopAndDelete
 - Arc::FileCache, 216
- StopReading
 - Arc::DataPoint, 156
 - Arc::DataPointIndex, 165
- StopWriting
 - Arc::DataPoint, 157
 - Arc::DataPointIndex, 165
- storeCert
 - Arc::OAuthConsumer, 306
 - Arc::SAML2SSOHTTPClient, 390
- str
 - Arc::Time, 433
 - Arc::URL, 440
 - Arc::URLLocation, 444
- string
 - Arc, 40
- SubmitterLoader
 - Arc::SubmitterLoader, 420
- Success
 - Arc::DataStatus, 171
- SystemError
 - Arc::DataStatus, 172
- TargetRetrieverLoader
 - Arc::TargetRetrieverLoader, 425
- Test::TestMCC, 428
- Test::TestService, 429
 - process, 429
- thread_stacksize
 - Arc, 41
- Time
 - Arc::Time, 431
- Timeout
 - Arc::PayloadStream, 322
 - Arc::PayloadStreamInterface, 325, 326
- TimeStamp
 - Arc, 40
- To
 - Arc::WSAHeader, 457
- Transfer
 - Arc::DataMover, 149
- transfer
 - Arc::DataSpeed, 169
- TransferError
 - Arc::DataStatus, 171
- Truncate
 - Arc::PayloadRaw, 314
 - Arc::PayloadRawInterface, 318
- UnimplementedError
 - Arc::DataStatus, 172
- UNKNOWN_SERVICE_ERROR
 - Arc, 35
- UnknownError
 - Arc::DataStatus, 172
- Unlink
 - Arc::MCC, 275
- unload
 - Arc::ModuleManager, 298
- unlock
 - Arc::SimpleCondition, 408
- Unregister
 - Arc::DataPoint, 157
 - Arc::DataPointDirect, 161
- UnregisterError
 - Arc::DataStatus, 171
- UpdateCredentials
 - Arc::DelegationConsumerSOAP, 181
 - Arc::DelegationContainerSOAP, 182
 - Arc::DelegationProviderSOAP, 186
- URL
 - Arc::URL, 436
- URL.h, 517
 - RC_DEFAULT_PORT, 518
- urlencode
 - Arc::ConfusaParserUtils, 117
- urlencode_params
 - Arc::ConfusaParserUtils, 117
- URLLocation
 - Arc::URLLocation, 443, 444
- urloptions

- Arc::URL, 442
- Username
 - Arc::URL, 440
 - Arc::UsernameToken, 449
- username
 - Arc::URL, 442
- UsernameToken
 - Arc::UsernameToken, 448, 449
- valid
 - Arc::URL, 442
- valid_
 - Arc::WSRF, 459
- verbose
 - Arc::DataMover, 150
 - Arc::DataSpeed, 169
- VerifyNode
 - Arc::XMLSecNode, 515
- VOMSDecode
 - Arc, 40
- VOMSTrustList
 - Arc::VOMSTrustList, 451
- Wait
 - Arc::Run, 386
- wait
 - Arc::SimpleCondition, 409
- wait_any
 - Arc::DataBuffer, 145
- wait_nonblock
 - Arc::SimpleCondition, 409
- WriteAcquireError
 - Arc::DataStatus, 171
- WriteError
 - Arc::DataStatus, 171
- WriteOutOfOrder
 - Arc::DataPoint, 157
 - Arc::DataPointDirect, 161
 - Arc::DataPointIndex, 165
- WriteResolveError
 - Arc::DataStatus, 171
- WriteStartError
 - Arc::DataStatus, 171
- WriteStdin
 - Arc::Run, 386
- WriteStopError
 - Arc::DataStatus, 171
- WSAEndpointReference
 - Arc::WSAEndpointReference, 453
- WSAFault
 - Arc, 35
- WSAFaultAssign
 - Arc, 40
- WSAFaultExtract
 - Arc, 40
- WSAFaultInvalidAddressingHeader
 - Arc, 36
- WSAFaultUnknown
 - Arc, 36
- WSAHeader
 - Arc::WSAHeader, 455
- WSRF
 - Arc::WSRF, 459
- WSRFBaseFault
 - Arc::WSRFBaseFault, 460
- WSRP
 - Arc::WSRP, 464
- WSRPFault
 - Arc::WSRPFault, 469
- WSRPResourcePropertyChangeFailure
 - Arc::WSRPResourcePropertyChangeFailure, 487
- X509Token
 - Arc::X509Token, 498
- X509TokenType
 - Arc::X509Token, 498
- XMLNode
 - Arc::XMLNode, 504
- XMLNodeContainer
 - Arc::XMLNodeContainer, 512
- XMLSecNode
 - Arc::XMLSecNode, 514
- XPathLookup
 - Arc::XMLNode, 511