

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	35
5.1.2	Typedef Documentation	35
5.1.2.1	AttrConstIter	35
5.1.2.2	AttrIter	35
5.1.2.3	AttrMap	35
5.1.2.4	get_plugin_instance	36
5.1.3	Enumeration Type Documentation	36
5.1.3.1	LogLevel	36
5.1.3.2	StatusKind	36
5.1.3.3	WSAFault	36
5.1.4	Function Documentation	37
5.1.4.1	addVOMSAC	37
5.1.4.2	ContentFromPayload	37
5.1.4.3	CreateThreadFunction	37
5.1.4.4	createVOMSAC	37
5.1.4.5	FileOpen	37

5.1.4.6	final_xmlsec	38
5.1.4.7	get_cert_str	38
5.1.4.8	get_key_from_certfile	38
5.1.4.9	get_key_from_certstr	38
5.1.4.10	get_key_from_keyfile	38
5.1.4.11	get_key_from_keystri	38
5.1.4.12	get_node	38
5.1.4.13	get_property	38
5.1.4.14	GUID	38
5.1.4.15	init_xmlsec	38
5.1.4.16	istring_to_level	39
5.1.4.17	load_key_from_certfile	39
5.1.4.18	load_key_from_certstr	39
5.1.4.19	load_key_from_keyfile	39
5.1.4.20	load_trusted_cert_file	39
5.1.4.21	load_trusted_cert_str	39
5.1.4.22	load_trusted_certs	39
5.1.4.23	MatchXMLName	40
5.1.4.24	MatchXMLName	40
5.1.4.25	MatchXMLName	40
5.1.4.26	MatchXMLNamespace	40
5.1.4.27	MatchXMLNamespace	40
5.1.4.28	MatchXMLNamespace	40
5.1.4.29	OpenSSLInit	40
5.1.4.30	operator<<	40
5.1.4.31	operator<<	40
5.1.4.32	operator<<	40
5.1.4.33	parseVOMSAC	41
5.1.4.34	parseVOMSAC	41
5.1.4.35	passphrase_callback	41
5.1.4.36	string	42
5.1.4.37	TimeStamp	42
5.1.4.38	TimeStamp	42
5.1.4.39	VOMSDecode	42
5.1.4.40	WSAFaultAssign	42
5.1.4.41	WSAFaultExtract	42

5.1.5	Variable Documentation	42
5.1.5.1	CredentialLogger	42
5.1.5.2	plugins_table_name	42
5.1.5.3	thread_stacksize	43
5.2	ArcCredential Namespace Reference	43
5.2.1	Detailed Description	44
5.2.2	Enumeration Type Documentation	44
5.2.2.1	certType	44
6	Data Structure Documentation	45
6.1	ArcCredential::ACACI Struct Reference	45
6.2	ArcCredential::ACATTHOLDER Struct Reference	45
6.3	ArcCredential::ACATTR Struct Reference	45
6.4	ArcCredential::ACATTRIBUTE Struct Reference	45
6.5	ArcCredential::ACC Struct Reference	45
6.6	ArcCredential::ACCERTS Struct Reference	46
6.7	ArcCredential::ACDIGEST Struct Reference	46
6.8	ArcCredential::ACFORM Struct Reference	46
6.9	ArcCredential::ACFULLATTRIBUTES Struct Reference	46
6.10	ArcCredential::ACHOLDER Struct Reference	46
6.11	ArcCredential::ACIETFATTR Struct Reference	46
6.12	ArcCredential::ACINFO Struct Reference	46
6.13	ArcCredential::ACIS Struct Reference	47
6.14	ArcCredential::ACSEQ Struct Reference	47
6.15	ArcCredential::ACTARGET Struct Reference	47
6.16	ArcCredential::ACTARGETS Struct Reference	47
6.17	ArcCredential::ACVAL Struct Reference	47
6.18	Arc::Adler32Sum Class Reference	47
6.18.1	Detailed Description	48
6.19	ArcSec::AlgFactory Class Reference	48
6.19.1	Detailed Description	48
6.19.2	Member Function Documentation	48
6.19.2.1	createAlg	48
6.20	ArcSec::AnyURIAttribute Class Reference	49
6.20.1	Member Function Documentation	49
6.20.1.1	encode	49
6.20.1.2	equal	49

6.20.1.3	getId	49
6.20.1.4	getType	49
6.21	Arc::ApplicationEnvironment Class Reference	50
6.21.1	Detailed Description	50
6.22	Arc::ApplicationType Class Reference	50
6.23	Arc::ArcLocation Class Reference	50
6.23.1	Detailed Description	50
6.23.2	Member Function Documentation	51
6.23.2.1	GetPlugins	51
6.23.2.2	Init	51
6.24	ArcSec::ArcPeriod Struct Reference	51
6.25	Arc::ARCPolicyHandlerConfig Class Reference	51
6.26	ArcSec::Attr Struct Reference	51
6.26.1	Detailed Description	52
6.27	ArcSec::AttributeFactory Class Reference	52
6.27.1	Detailed Description	52
6.28	Arc::AttributeIterator Class Reference	52
6.28.1	Detailed Description	53
6.28.2	Constructor & Destructor Documentation	53
6.28.2.1	AttributeIterator	53
6.28.2.2	AttributeIterator	53
6.28.3	Member Function Documentation	53
6.28.3.1	hasMore	53
6.28.3.2	key	54
6.28.3.3	operator*	54
6.28.3.4	operator++	54
6.28.3.5	operator++	54
6.28.3.6	operator->	54
6.28.4	Friends And Related Function Documentation	54
6.28.4.1	MessageAttributes	54
6.28.5	Field Documentation	55
6.28.5.1	current_	55
6.28.5.2	end_	55
6.29	ArcSec::AttributeProxy Class Reference	55
6.29.1	Detailed Description	55
6.29.2	Member Function Documentation	55

6.29.2.1	getAttribute	55
6.30	ArcSec::AttributeValue Class Reference	56
6.30.1	Detailed Description	56
6.30.2	Member Function Documentation	57
6.30.2.1	encode	57
6.30.2.2	equal	57
6.30.2.3	getId	57
6.30.2.4	getType	57
6.31	ArcSec::Attrs Class Reference	57
6.31.1	Detailed Description	58
6.32	ArcSec::AuthzRequest Struct Reference	58
6.33	ArcSec::AuthzRequestSection Struct Reference	58
6.33.1	Detailed Description	58
6.34	Arc::AutoPointer< T > Class Template Reference	58
6.34.1	Detailed Description	59
6.35	Arc::Base64 Class Reference	59
6.36	Arc::BaseConfig Class Reference	59
6.36.1	Detailed Description	59
6.36.2	Member Function Documentation	60
6.36.2.1	AddCADir	60
6.36.2.2	AddCAFile	60
6.36.2.3	AddCertificate	60
6.36.2.4	AddOverlay	60
6.36.2.5	AddPluginsPath	60
6.36.2.6	AddPrivateKey	60
6.36.2.7	AddProxy	60
6.36.2.8	GetOverlay	60
6.36.2.9	MakeConfig	60
6.37	ArcSec::BooleanAttribute Class Reference	61
6.37.1	Member Function Documentation	61
6.37.1.1	encode	61
6.37.1.2	equal	61
6.37.1.3	getId	61
6.37.1.4	getType	61
6.38	Arc::Broker Class Reference	62
6.38.1	Member Function Documentation	62

6.38.1.1	GetBestTarget	62
6.38.1.2	PreFilterTargets	62
6.38.1.3	SortTargets	63
6.38.2	Field Documentation	63
6.38.2.1	PossibleTargets	63
6.39	Arc::BrokerLoader Class Reference	63
6.39.1	Detailed Description	63
6.39.2	Constructor & Destructor Documentation	64
6.39.2.1	BrokerLoader	64
6.39.2.2	~BrokerLoader	64
6.39.3	Member Function Documentation	64
6.39.3.1	GetBrokers	64
6.39.3.2	load	64
6.40	Arc::BrokerPluginArgument Class Reference	64
6.41	Arc::ByteArray Class Reference	65
6.42	Arc::CacheParameters Struct Reference	65
6.42.1	Detailed Description	65
6.43	ArcCredential::cert_verify_context Struct Reference	65
6.44	Arc::CertEnvLocker Class Reference	65
6.45	Arc::ChainContext Class Reference	65
6.45.1	Detailed Description	65
6.45.2	Member Function Documentation	66
6.45.2.1	operator PluginsFactory *	66
6.46	Arc::Checksum Class Reference	66
6.46.1	Detailed Description	66
6.47	Arc::ChecksumAny Class Reference	66
6.47.1	Detailed Description	67
6.48	Arc::CStringValue Class Reference	67
6.48.1	Detailed Description	67
6.48.2	Constructor & Destructor Documentation	67
6.48.2.1	CStringValue	67
6.48.2.2	CStringValue	67
6.48.2.3	CStringValue	68
6.48.3	Member Function Documentation	68
6.48.3.1	equal	68
6.48.3.2	operator bool	68

6.49	Arc::ClassLoader Class Reference	68
6.50	Arc::ClassLoaderPluginArgument Class Reference	68
6.51	Arc::ClientHTTP Class Reference	69
6.51.1	Detailed Description	69
6.52	Arc::ClientHTTPwithSAML2SSO Class Reference	69
6.52.1	Constructor & Destructor Documentation	69
6.52.1.1	ClientHTTPwithSAML2SSO	69
6.52.2	Member Function Documentation	70
6.52.2.1	process	70
6.53	Arc::ClientInterface Class Reference	70
6.53.1	Detailed Description	70
6.54	Arc::ClientSOAP Class Reference	70
6.54.1	Detailed Description	71
6.54.2	Constructor & Destructor Documentation	71
6.54.2.1	ClientSOAP	71
6.54.3	Member Function Documentation	71
6.54.3.1	AddSecHandler	71
6.54.3.2	GetEntry	71
6.54.3.3	Load	72
6.54.3.4	process	72
6.54.3.5	process	72
6.55	Arc::ClientSOAPwithSAML2SSO Class Reference	72
6.55.1	Constructor & Destructor Documentation	72
6.55.1.1	ClientSOAPwithSAML2SSO	72
6.55.2	Member Function Documentation	72
6.55.2.1	process	72
6.55.2.2	process	73
6.56	Arc::ClientTCP Class Reference	73
6.56.1	Detailed Description	73
6.57	Arc::ClientX509Delegation Class Reference	73
6.57.1	Constructor & Destructor Documentation	74
6.57.1.1	ClientX509Delegation	74
6.57.2	Member Function Documentation	74
6.57.2.1	acquireDelegation	74
6.57.2.2	createDelegation	74
6.58	ArcSec::CombiningAlg Class Reference	75

6.58.1 Detailed Description	75
6.58.2 Member Function Documentation	75
6.58.2.1 combine	75
6.58.2.2 getalgId	75
6.59 Arc::Config Class Reference	76
6.59.1 Detailed Description	76
6.59.2 Constructor & Destructor Documentation	76
6.59.2.1 Config	76
6.59.2.2 Config	76
6.59.2.3 Config	77
6.59.2.4 Config	77
6.59.2.5 Config	77
6.59.2.6 Config	77
6.59.3 Member Function Documentation	77
6.59.3.1 getFileName	77
6.59.3.2 parse	77
6.59.3.3 print	77
6.59.3.4 save	77
6.59.3.5 setFileName	77
6.60 Arc::ConfusaCertHandler Class Reference	77
6.60.1 Detailed Description	78
6.60.2 Constructor & Destructor Documentation	78
6.60.2.1 ConfusaCertHandler	78
6.60.3 Member Function Documentation	78
6.60.3.1 createCertRequest	78
6.60.3.2 getCertRequestB64	78
6.61 Arc::ConfusaParserUtils Class Reference	78
6.61.1 Detailed Description	79
6.61.2 Member Function Documentation	79
6.61.2.1 destroy_doc	79
6.61.2.2 evaluate_path	79
6.61.2.3 extract_body_information	79
6.61.2.4 get_doc	79
6.61.2.5 handle_redirect_step	79
6.61.2.6 urlencode	79
6.61.2.7 urlencode_params	79

6.62	Arc::CountedPointer< T > Class Template Reference	80
6.62.1	Detailed Description	80
6.63	Arc::Counter Class Reference	80
6.63.1	Detailed Description	81
6.63.2	Member Typedef Documentation	82
6.63.2.1	IDType	82
6.63.3	Constructor & Destructor Documentation	82
6.63.3.1	Counter	82
6.63.3.2	~Counter	83
6.63.4	Member Function Documentation	83
6.63.4.1	cancel	83
6.63.4.2	changeExcess	83
6.63.4.3	changeLimit	83
6.63.4.4	extend	84
6.63.4.5	getCounterTicket	84
6.63.4.6	getCurrentTime	84
6.63.4.7	getExcess	84
6.63.4.8	getExpirationReminder	85
6.63.4.9	getExpiryTime	85
6.63.4.10	getLimit	85
6.63.4.11	getValue	86
6.63.4.12	reserve	86
6.63.4.13	setExcess	86
6.63.4.14	setLimit	87
6.64	Arc::CounterTicket Class Reference	87
6.64.1	Detailed Description	87
6.64.2	Constructor & Destructor Documentation	88
6.64.2.1	CounterTicket	88
6.64.3	Member Function Documentation	88
6.64.3.1	cancel	88
6.64.3.2	extend	88
6.64.3.3	isValid	88
6.65	Arc::CRC32Sum Class Reference	88
6.65.1	Detailed Description	89
6.66	Arc::Credential Class Reference	89
6.66.1	Constructor & Destructor Documentation	90

6.66.1.1	Credential	90
6.66.1.2	Credential	90
6.66.1.3	Credential	90
6.66.1.4	Credential	91
6.66.1.5	Credential	91
6.66.1.6	Credential	91
6.66.2	Member Function Documentation	92
6.66.2.1	AddCertExtObj	92
6.66.2.2	AddExtension	92
6.66.2.3	AddExtension	92
6.66.2.4	GenerateEECRequest	92
6.66.2.5	GenerateEECRequest	92
6.66.2.6	GenerateEECRequest	92
6.66.2.7	GenerateRequest	93
6.66.2.8	GenerateRequest	93
6.66.2.9	GenerateRequest	93
6.66.2.10	GetCert	93
6.66.2.11	GetCertNumofChain	93
6.66.2.12	GetCertReq	93
6.66.2.13	GetDN	93
6.66.2.14	GetEndTime	93
6.66.2.15	getFormat	93
6.66.2.16	GetIdentityName	93
6.66.2.17	GetLifeTime	93
6.66.2.18	GetPrivKey	94
6.66.2.19	GetProxyPolicy	94
6.66.2.20	GetPubKey	94
6.66.2.21	GetStartTime	94
6.66.2.22	GetType	94
6.66.2.23	GetVerification	94
6.66.2.24	InitProxyCertInfo	94
6.66.2.25	InquireRequest	94
6.66.2.26	InquireRequest	94
6.66.2.27	InquireRequest	94
6.66.2.28	IsCredentialsValid	95
6.66.2.29	IsValid	95

6.66.2.30 LogError	95
6.66.2.31 OutputCertificate	95
6.66.2.32 OutputCertificateChain	95
6.66.2.33 OutputPrivatekey	95
6.66.2.34 OutputPublickey	95
6.66.2.35 SetLifeTime	95
6.66.2.36 SetProxyPolicy	96
6.66.2.37 SetStartTime	96
6.66.2.38 SignEECRequest	96
6.66.2.39 SignEECRequest	96
6.66.2.40 SignEECRequest	96
6.66.2.41 SignRequest	96
6.66.2.42 SignRequest	96
6.66.2.43 SignRequest	96
6.66.2.44 STACK_OF	97
6.67 Arc::CredentialError Class Reference	97
6.67.1 Detailed Description	97
6.67.2 Constructor & Destructor Documentation	97
6.67.2.1 CredentialError	97
6.68 Arc::CredentialStore Class Reference	97
6.68.1 Detailed Description	97
6.69 Arc::Database Class Reference	98
6.69.1 Detailed Description	98
6.69.2 Constructor & Destructor Documentation	98
6.69.2.1 Database	98
6.69.2.2 Database	98
6.69.2.3 Database	98
6.69.2.4 ~Database	98
6.69.3 Member Function Documentation	99
6.69.3.1 close	99
6.69.3.2 connect	99
6.69.3.3 enable_ssl	99
6.69.3.4 isconnected	99
6.69.3.5 shutdown	99
6.70 Arc::DataBuffer Class Reference	100
6.70.1 Detailed Description	101

6.70.2	Constructor & Destructor Documentation	101
6.70.2.1	DataBuffer	101
6.70.2.2	DataBuffer	101
6.70.3	Member Function Documentation	101
6.70.3.1	add	101
6.70.3.2	buffer_size	101
6.70.3.3	checksum_object	102
6.70.3.4	checksum_valid	102
6.70.3.5	eof_read	102
6.70.3.6	eof_read	102
6.70.3.7	eof_write	102
6.70.3.8	eof_write	102
6.70.3.9	error	102
6.70.3.10	error_read	102
6.70.3.11	error_write	103
6.70.3.12	for_read	103
6.70.3.13	for_read	103
6.70.3.14	for_write	103
6.70.3.15	for_write	103
6.70.3.16	is_notwritten	103
6.70.3.17	is_notwritten	104
6.70.3.18	is_read	104
6.70.3.19	is_read	104
6.70.3.20	is_written	104
6.70.3.21	is_written	104
6.70.3.22	set	105
6.70.3.23	wait_any	105
6.71	Arc::DataCallback Class Reference	105
6.71.1	Detailed Description	105
6.72	Arc::DataHandle Class Reference	105
6.72.1	Detailed Description	105
6.73	Arc::DataMover Class Reference	106
6.73.1	Detailed Description	106
6.73.2	Member Function Documentation	106
6.73.2.1	checks	106
6.73.2.2	checks	106

6.73.2.3	force_to_meta	107
6.73.2.4	secure	107
6.73.2.5	set_default_max_inactivity_time	107
6.73.2.6	set_default_min_average_speed	107
6.73.2.7	set_default_min_speed	107
6.73.2.8	Transfer	107
6.73.2.9	Transfer	108
6.73.2.10	verbose	108
6.74	Arc::DataPoint Class Reference	108
6.74.1	Detailed Description	110
6.74.2	Member Enumeration Documentation	110
6.74.2.1	DataPointAccessLatency	110
6.74.2.2	DataPointInfoType	111
6.74.3	Constructor & Destructor Documentation	111
6.74.3.1	DataPoint	111
6.74.4	Member Function Documentation	111
6.74.4.1	AddChecksumObject	111
6.74.4.2	AddLocation	111
6.74.4.3	Check	112
6.74.4.4	CompareLocationMetadata	112
6.74.4.5	CompareMeta	112
6.74.4.6	CurrentLocationMetadata	112
6.74.4.7	GetFailureReason	112
6.74.4.8	List	112
6.74.4.9	NextLocation	113
6.74.4.10	Passive	113
6.74.4.11	PostRegister	113
6.74.4.12	PreRegister	113
6.74.4.13	PreUnregister	113
6.74.4.14	ProvidesMeta	114
6.74.4.15	Range	114
6.74.4.16	ReadOutOfOrder	114
6.74.4.17	Registered	114
6.74.4.18	Resolve	114
6.74.4.19	SetAdditionalChecks	115
6.74.4.20	SetMeta	115

6.74.4.21 SetSecure	115
6.74.4.22 SortLocations	115
6.74.4.23 StartReading	116
6.74.4.24 StartWriting	116
6.74.4.25 Stat	116
6.74.4.26 StopReading	116
6.74.4.27 StopWriting	117
6.74.4.28 Unregister	117
6.74.4.29 WriteOutOfOrder	117
6.74.5 Field Documentation	117
6.74.5.1 valid_url_options	117
6.75 Arc::DataPointDirect Class Reference	117
6.75.1 Detailed Description	118
6.75.2 Member Function Documentation	118
6.75.2.1 AddChecksumObject	118
6.75.2.2 AddLocation	119
6.75.2.3 CompareLocationMetadata	119
6.75.2.4 CurrentLocationMetadata	119
6.75.2.5 NextLocation	119
6.75.2.6 Passive	119
6.75.2.7 PostRegister	120
6.75.2.8 PreRegister	120
6.75.2.9 PreUnregister	120
6.75.2.10 ProvidesMeta	120
6.75.2.11 Range	120
6.75.2.12 ReadOutOfOrder	121
6.75.2.13 Registered	121
6.75.2.14 Resolve	121
6.75.2.15 SetAdditionalChecks	121
6.75.2.16 SetSecure	122
6.75.2.17 SortLocations	122
6.75.2.18 Unregister	122
6.75.2.19 WriteOutOfOrder	122
6.76 Arc::DataPointIndex Class Reference	122
6.76.1 Detailed Description	124
6.76.2 Member Function Documentation	124

6.76.2.1	AddChecksumObject	124
6.76.2.2	AddLocation	124
6.76.2.3	Check	124
6.76.2.4	CompareLocationMetadata	124
6.76.2.5	CurrentLocationMetadata	125
6.76.2.6	NextLocation	125
6.76.2.7	Passive	125
6.76.2.8	ProvidesMeta	125
6.76.2.9	Range	125
6.76.2.10	ReadOutOfOrder	125
6.76.2.11	Registered	126
6.76.2.12	SetAdditionalChecks	126
6.76.2.13	SetMeta	126
6.76.2.14	SetSecure	126
6.76.2.15	SortLocations	126
6.76.2.16	StartReading	127
6.76.2.17	StartWriting	127
6.76.2.18	StopReading	127
6.76.2.19	StopWriting	127
6.76.2.20	WriteOutOfOrder	127
6.77	Arc::DataPointLoader Class Reference	128
6.78	Arc::DataPointPluginArgument Class Reference	128
6.79	Arc::DataSourceType Class Reference	128
6.80	Arc::DataSpeed Class Reference	128
6.80.1	Detailed Description	129
6.80.2	Constructor & Destructor Documentation	129
6.80.2.1	DataSpeed	129
6.80.2.2	DataSpeed	129
6.80.3	Member Function Documentation	130
6.80.3.1	hold	130
6.80.3.2	set_base	130
6.80.3.3	set_max_data	130
6.80.3.4	set_max_inactivity_time	130
6.80.3.5	set_min_average_speed	130
6.80.3.6	set_min_speed	131
6.80.3.7	set_progress_indicator	131

6.80.3.8	transfer	131
6.80.3.9	verbose	131
6.80.3.10	verbose	131
6.81	Arc::DataStagingType Class Reference	131
6.82	Arc::DataStatus Class Reference	132
6.82.1	Detailed Description	132
6.82.2	Member Enumeration Documentation	132
6.82.2.1	DataStatusType	132
6.83	Arc::DataTargetType Class Reference	133
6.84	Arc::DataType Class Reference	133
6.85	ArcSec::DateAttribute Class Reference	134
6.85.1	Member Function Documentation	134
6.85.1.1	encode	134
6.85.1.2	equal	134
6.85.1.3	getId	134
6.85.1.4	getType	134
6.86	ArcSec::DateTimeAttribute Class Reference	135
6.86.1	Detailed Description	135
6.86.2	Member Function Documentation	135
6.86.2.1	encode	135
6.86.2.2	equal	135
6.86.2.3	getId	135
6.86.2.4	getType	135
6.87	Arc::DBranch Class Reference	136
6.88	Arc::DelegationConsumer Class Reference	136
6.88.1	Detailed Description	136
6.88.2	Constructor & Destructor Documentation	137
6.88.2.1	DelegationConsumer	137
6.88.2.2	DelegationConsumer	137
6.88.3	Member Function Documentation	137
6.88.3.1	Acquire	137
6.88.3.2	Acquire	137
6.88.3.3	Backup	137
6.88.3.4	Generate	137
6.88.3.5	ID	137
6.88.3.6	LogError	137

6.88.3.7	Request	137
6.88.3.8	Restore	137
6.89	Arc::DelegationConsumerSOAP Class Reference	138
6.89.1	Detailed Description	138
6.89.2	Constructor & Destructor Documentation	138
6.89.2.1	DelegationConsumerSOAP	138
6.89.2.2	DelegationConsumerSOAP	138
6.89.3	Member Function Documentation	138
6.89.3.1	DelegateCredentialsInit	138
6.89.3.2	DelegatedToken	139
6.89.3.3	UpdateCredentials	139
6.89.3.4	UpdateCredentials	139
6.90	Arc::DelegationContainerSOAP Class Reference	139
6.90.1	Detailed Description	139
6.90.2	Member Function Documentation	140
6.90.2.1	DelegateCredentialsInit	140
6.90.2.2	DelegatedToken	140
6.90.2.3	UpdateCredentials	140
6.90.3	Field Documentation	140
6.90.3.1	context_lock_	140
6.90.3.2	max_duration_	140
6.90.3.3	max_size_	140
6.90.3.4	max_usage_	140
6.90.3.5	restricted_	140
6.91	Arc::DelegationProvider Class Reference	140
6.91.1	Detailed Description	141
6.91.2	Constructor & Destructor Documentation	141
6.91.2.1	DelegationProvider	141
6.91.2.2	DelegationProvider	141
6.91.3	Member Function Documentation	141
6.91.3.1	Delegate	141
6.92	Arc::DelegationProviderSOAP Class Reference	141
6.92.1	Detailed Description	142
6.92.2	Constructor & Destructor Documentation	142
6.92.2.1	DelegationProviderSOAP	142
6.92.2.2	DelegationProviderSOAP	142

6.92.3	Member Function Documentation	143
6.92.3.1	DelegateCredentialsInit	143
6.92.3.2	DelegateCredentialsInit	143
6.92.3.3	DelegatedToken	143
6.92.3.4	ID	143
6.92.3.5	UpdateCredentials	143
6.92.3.6	UpdateCredentials	143
6.93	ArcSec::DenyOverridesCombiningAlg Class Reference	143
6.93.1	Detailed Description	144
6.93.2	Member Function Documentation	144
6.93.2.1	combine	144
6.93.2.2	getalgId	144
6.94	Arc::DirectoryType Class Reference	145
6.95	Arc::DiskSpaceRequirementType Class Reference	145
6.96	Arc::DItem Class Reference	145
6.97	Arc::DItemString Class Reference	145
6.98	Arc::DNListHandlerConfig Class Reference	146
6.99	ArcSec::DurationAttribute Class Reference	146
6.99.1	Detailed Description	146
6.99.2	Member Function Documentation	146
6.99.2.1	encode	146
6.99.2.2	equal	147
6.99.2.3	getId	147
6.99.2.4	getType	147
6.100	ArcSec::EqualFunction Class Reference	147
6.100.1	Detailed Description	148
6.100.2	Member Function Documentation	148
6.100.2.1	evaluate	148
6.100.2.2	evaluate	148
6.100.2.3	getFunctionName	148
6.101	ArcSec::EvalResult Struct Reference	148
6.101.1	Detailed Description	148
6.102	ArcSec::EvaluationCtx Class Reference	148
6.102.1	Detailed Description	149
6.102.2	Constructor & Destructor Documentation	149
6.102.2.1	EvaluationCtx	149

6.103ArcSec::Evaluator Class Reference	149
6.103.1 Detailed Description	150
6.103.2 Member Function Documentation	150
6.103.2.1 addPolicy	150
6.103.2.2 addPolicy	150
6.103.2.3 evaluate	150
6.103.2.4 evaluate	150
6.103.2.5 evaluate	150
6.103.2.6 evaluate	150
6.103.2.7 evaluate	151
6.103.2.8 evaluate	151
6.103.2.9 evaluate	151
6.103.2.10getAlgFactory	151
6.103.2.11getAttrFactory	151
6.103.2.12getFnFactory	151
6.103.2.13getName	151
6.103.2.14setCombiningAlg	151
6.103.2.15setCombiningAlg	151
6.104ArcSec::EvaluatorContext Class Reference	152
6.104.1 Detailed Description	152
6.104.2 Member Function Documentation	152
6.104.2.1 operator AlgFactory *	152
6.104.2.2 operator AttributeFactory *	152
6.104.2.3 operator FnFactory *	152
6.105ArcSec::EvaluatorLoader Class Reference	152
6.105.1 Detailed Description	153
6.105.2 Member Function Documentation	153
6.105.2.1 getEvaluator	153
6.105.2.2 getEvaluator	153
6.105.2.3 getEvaluator	153
6.105.2.4 getPolicy	153
6.105.2.5 getPolicy	153
6.105.2.6 getRequest	153
6.105.2.7 getRequest	153
6.106Arc::ExecutableType Class Reference	154
6.107Arc::ExecutionTarget Class Reference	154

6.107.1 Detailed Description	154
6.107.2 Constructor & Destructor Documentation	154
6.107.2.1 ExecutionTarget	154
6.107.2.2 ExecutionTarget	155
6.107.2.3 ExecutionTarget	155
6.107.3 Member Function Documentation	155
6.107.3.1 GetSubmitter	155
6.107.3.2 operator=	155
6.107.3.3 Print	155
6.107.3.4 SaveToStream	156
6.107.3.5 Update	156
6.107.4 Field Documentation	156
6.107.4.1 ApplicationEnvironments	156
6.107.4.2 ComputingShareName	156
6.107.4.3 FreeSlotsWithDuration	156
6.107.4.4 MaxDiskSpace	157
6.107.4.5 MaxMainMemory	157
6.107.4.6 MaxVirtualMemory	157
6.107.4.7 OperatingSystem	157
6.108Arc::ExpirationReminder Class Reference	157
6.108.1 Detailed Description	158
6.108.2 Member Function Documentation	158
6.108.2.1 getExpiryTime	158
6.108.2.2 getReservationID	158
6.108.2.3 operator<	158
6.109Arc::FileCache Class Reference	158
6.109.1 Detailed Description	159
6.109.2 Constructor & Destructor Documentation	160
6.109.2.1 FileCache	160
6.109.2.2 FileCache	160
6.109.2.3 FileCache	160
6.109.2.4 FileCache	161
6.109.3 Member Function Documentation	161
6.109.3.1 AddDN	161
6.109.3.2 CheckCreated	161
6.109.3.3 CheckDN	161

6.109.3.4 CheckValid	161
6.109.3.5 Copy	161
6.109.3.6 File	161
6.109.3.7 GetCreated	162
6.109.3.8 GetValid	162
6.109.3.9 Link	162
6.109.3.10operator bool	162
6.109.3.11operator==	162
6.109.3.12Release	162
6.109.3.13SetValid	162
6.109.3.14Start	163
6.109.3.15Stop	163
6.109.3.16StopAndDelete	163
6.110FileCacheHash Class Reference	163
6.110.1 Detailed Description	164
6.110.2 Member Function Documentation	164
6.110.2.1 getHash	164
6.110.2.2 maxLength	164
6.111Arc::FileInfo Class Reference	164
6.111.1 Detailed Description	164
6.112Arc::FileLock Class Reference	164
6.112.1 Detailed Description	165
6.113Arc::FileType Class Reference	165
6.114Arc::FinderLoader Class Reference	165
6.115ArcSec::FnFactory Class Reference	165
6.115.1 Detailed Description	166
6.115.2 Member Function Documentation	166
6.115.2.1 createFn	166
6.116ArcSec::Function Class Reference	166
6.116.1 Detailed Description	166
6.116.2 Member Function Documentation	167
6.116.2.1 evaluate	167
6.116.2.2 evaluate	167
6.117ArcSec::GenericAttribute Class Reference	167
6.117.1 Member Function Documentation	167
6.117.1.1 encode	167

6.117.1.2 equal	167
6.117.1.3 getId	168
6.117.1.4 getType	168
6.118Arc::GlobusResult Class Reference	168
6.119Arc::GSSCredential Class Reference	168
6.120Arc::HakaClient Class Reference	168
6.120.1 Member Function Documentation	169
6.120.1.1 processConsent	169
6.120.1.2 processIdP2Confusa	169
6.120.1.3 processIdPLogin	169
6.121Arc::HTTPClientInfo Struct Reference	169
6.122Arc::InfoCache Class Reference	169
6.122.1 Detailed Description	169
6.122.2 Constructor & Destructor Documentation	170
6.122.2.1 InfoCache	170
6.123Arc::InfoCacheInterface Class Reference	170
6.123.1 Member Function Documentation	170
6.123.1.1 Get	170
6.124Arc::InfoFilter Class Reference	170
6.124.1 Detailed Description	171
6.124.2 Constructor & Destructor Documentation	171
6.124.2.1 InfoFilter	171
6.124.3 Member Function Documentation	171
6.124.3.1 Filter	171
6.124.3.2 Filter	171
6.125Arc::InfoRegister Class Reference	171
6.125.1 Detailed Description	172
6.126Arc::InfoRegisterContainer Class Reference	172
6.126.1 Detailed Description	172
6.126.2 Member Function Documentation	172
6.126.2.1 addRegistrar	172
6.126.2.2 addService	172
6.126.2.3 removeService	172
6.127Arc::InfoRegisters Class Reference	173
6.127.1 Detailed Description	173
6.127.2 Constructor & Destructor Documentation	173

6.127.2.1 InfoRegisters	173
6.128Arc::InfoRegistrar Class Reference	173
6.128.1 Detailed Description	173
6.128.2 Member Function Documentation	174
6.128.2.1 addService	174
6.128.2.2 registration	174
6.129Arc::InformationContainer Class Reference	174
6.129.1 Detailed Description	174
6.129.2 Constructor & Destructor Documentation	175
6.129.2.1 InformationContainer	175
6.129.3 Member Function Documentation	175
6.129.3.1 Acquire	175
6.129.3.2 Assign	175
6.129.3.3 Get	175
6.129.4 Field Documentation	175
6.129.4.1 doc_	175
6.130Arc::InformationInterface Class Reference	175
6.130.1 Detailed Description	176
6.130.2 Constructor & Destructor Documentation	176
6.130.2.1 InformationInterface	176
6.130.3 Member Function Documentation	176
6.130.3.1 Get	176
6.130.4 Field Documentation	176
6.130.4.1 lock_	176
6.131Arc::InformationRequest Class Reference	176
6.131.1 Detailed Description	177
6.131.2 Constructor & Destructor Documentation	177
6.131.2.1 InformationRequest	177
6.131.2.2 InformationRequest	177
6.131.2.3 InformationRequest	177
6.131.2.4 InformationRequest	177
6.131.3 Member Function Documentation	177
6.131.3.1 SOAP	177
6.132Arc::InformationResponse Class Reference	178
6.132.1 Detailed Description	178
6.132.2 Constructor & Destructor Documentation	178

6.132.2.1 InformationResponse	178
6.132.3 Member Function Documentation	178
6.132.3.1 Result	178
6.133Arc::IniConfig Class Reference	178
6.134Arc::initializeCredentialsType Class Reference	179
6.135ArcSec::InRangeFunction Class Reference	179
6.135.1 Member Function Documentation	179
6.135.1.1 evaluate	179
6.135.1.2 evaluate	179
6.136Arc::IntraProcessCounter Class Reference	179
6.136.1 Detailed Description	180
6.136.2 Constructor & Destructor Documentation	180
6.136.2.1 IntraProcessCounter	180
6.136.2.2 ~IntraProcessCounter	181
6.136.3 Member Function Documentation	181
6.136.3.1 cancel	181
6.136.3.2 changeExcess	181
6.136.3.3 changeLimit	181
6.136.3.4 extend	182
6.136.3.5 getExcess	182
6.136.3.6 getLimit	182
6.136.3.7 getValue	182
6.136.3.8 reserve	183
6.136.3.9 setExcess	183
6.136.3.10setLimit	183
6.137Arc::ISIS_description Struct Reference	184
6.138Arc::IString Class Reference	184
6.139Arc::JobDescriptionParserLoader::iterator Class Reference	184
6.140Arc::Job Class Reference	184
6.140.1 Detailed Description	184
6.140.2 Constructor & Destructor Documentation	185
6.140.2.1 Job	185
6.140.3 Member Function Documentation	185
6.140.3.1 operator=	185
6.140.3.2 Print	185
6.140.3.3 SaveToStream	185

6.140.3.4 ToXML	186
6.141Arc::JobController Class Reference	186
6.141.1 Detailed Description	186
6.141.2 Member Function Documentation	187
6.141.2.1 Cat	187
6.141.2.2 Cat	187
6.141.2.3 FillJobStore	188
6.141.2.4 Migrate	188
6.141.2.5 PrintJobStatus	188
6.141.2.6 SaveJobStatusToStream	189
6.142Arc::JobControllerLoader Class Reference	189
6.142.1 Detailed Description	190
6.142.2 Constructor & Destructor Documentation	190
6.142.2.1 JobControllerLoader	190
6.142.2.2 ~JobControllerLoader	190
6.142.3 Member Function Documentation	190
6.142.3.1 GetJobControllers	190
6.142.3.2 load	190
6.143Arc::JobControllerPluginArgument Class Reference	190
6.144Arc::JobDescription Class Reference	191
6.144.1 Member Function Documentation	191
6.144.1.1 Print	191
6.144.1.2 SaveToStream	191
6.145Arc::JobDescriptionParser Class Reference	192
6.146Arc::JobDescriptionParserLoader Class Reference	192
6.146.1 Detailed Description	192
6.146.2 Constructor & Destructor Documentation	193
6.146.2.1 JobDescriptionParserLoader	193
6.146.2.2 ~JobDescriptionParserLoader	193
6.146.3 Member Function Documentation	193
6.146.3.1 GetJobDescriptionParsers	193
6.146.3.2 load	193
6.147Arc::JobIdentificationType Class Reference	193
6.148Arc::JobMetaType Class Reference	193
6.149Arc::JobState Class Reference	194
6.149.1 Detailed Description	194

6.150Arc::JobSupervisor Class Reference	194
6.150.1 Detailed Description	194
6.150.2 Constructor & Destructor Documentation	194
6.150.2.1 JobSupervisor	194
6.150.3 Member Function Documentation	195
6.150.3.1 GetJobControllers	195
6.151Arc::LoadableModuleDescription Class Reference	195
6.152Arc::Loader Class Reference	195
6.152.1 Detailed Description	195
6.152.2 Constructor & Destructor Documentation	196
6.152.2.1 Loader	196
6.152.2.2 ~Loader	196
6.152.3 Field Documentation	196
6.152.3.1 factory_	196
6.153Arc::LogDestination Class Reference	196
6.153.1 Detailed Description	196
6.153.2 Constructor & Destructor Documentation	197
6.153.2.1 LogDestination	197
6.153.2.2 LogDestination	197
6.154Arc::LogFile Class Reference	197
6.154.1 Detailed Description	197
6.154.2 Constructor & Destructor Documentation	198
6.154.2.1 LogFile	198
6.154.2.2 LogFile	198
6.154.3 Member Function Documentation	198
6.154.3.1 log	198
6.154.3.2 setBackups	198
6.154.3.3 setMaxSize	198
6.154.3.4 setReopen	199
6.155Arc::Logger Class Reference	199
6.155.1 Detailed Description	200
6.155.2 Constructor & Destructor Documentation	200
6.155.2.1 Logger	200
6.155.2.2 Logger	200
6.155.2.3 ~Logger	200
6.155.3 Member Function Documentation	200

6.155.3.1 addDestination	200
6.155.3.2 addDestinations	201
6.155.3.3 getDestinations	201
6.155.3.4 getRootLogger	201
6.155.3.5 getThreshold	201
6.155.3.6 msg	201
6.155.3.7 msg	201
6.155.3.8 setThreadContext	202
6.155.3.9 setThreshold	202
6.155.3.10setThresholdForDomain	202
6.155.3.11setThresholdForDomain	202
6.156Arc::LoggerContext Class Reference	203
6.156.1 Detailed Description	203
6.157Arc::LoggerFormat Struct Reference	203
6.158Arc::LogMessage Class Reference	203
6.158.1 Detailed Description	204
6.158.2 Constructor & Destructor Documentation	204
6.158.2.1 LogMessage	204
6.158.2.2 LogMessage	204
6.158.3 Member Function Documentation	204
6.158.3.1 getLevel	204
6.158.3.2 setIdentifier	204
6.158.4 Friends And Related Function Documentation	205
6.158.4.1 Logger	205
6.158.4.2 operator<<	205
6.159Arc::LogStream Class Reference	205
6.159.1 Detailed Description	205
6.159.2 Constructor & Destructor Documentation	206
6.159.2.1 LogStream	206
6.159.2.2 LogStream	206
6.159.3 Member Function Documentation	206
6.159.3.1 log	206
6.160ArcSec::MatchFunction Class Reference	206
6.160.1 Detailed Description	207
6.160.2 Member Function Documentation	207
6.160.2.1 evaluate	207

6.160.2.2 evaluate	207
6.160.2.3 getFunctionName	207
6.161Arc::MCC Class Reference	207
6.161.1 Detailed Description	208
6.161.2 Constructor & Destructor Documentation	208
6.161.2.1 MCC	208
6.161.3 Member Function Documentation	209
6.161.3.1 AddSecHandler	209
6.161.3.2 Next	209
6.161.3.3 process	209
6.161.3.4 ProcessSecHandlers	209
6.161.3.5 Unlink	209
6.161.4 Field Documentation	209
6.161.4.1 logger	209
6.161.4.2 next_	210
6.161.4.3 sechandlers_	210
6.162Arc::MCC_Status Class Reference	210
6.162.1 Detailed Description	210
6.162.2 Constructor & Destructor Documentation	210
6.162.2.1 MCC_Status	210
6.162.3 Member Function Documentation	211
6.162.3.1 getExplanation	211
6.162.3.2 getKind	211
6.162.3.3 getOrigin	211
6.162.3.4 isOk	211
6.162.3.5 operator bool	212
6.162.3.6 operator std::string	212
6.162.3.7 operator!	212
6.163Arc::MCCConfig Class Reference	212
6.163.1 Member Function Documentation	213
6.163.1.1 MakeConfig	213
6.164Arc::MCCInterface Class Reference	213
6.164.1 Detailed Description	213
6.164.2 Member Function Documentation	213
6.164.2.1 process	213
6.165Arc::MCCLoader Class Reference	214

6.165.1 Detailed Description	214
6.165.2 Constructor & Destructor Documentation	215
6.165.2.1 MCCLoader	215
6.165.2.2 ~MCCLoader	215
6.165.3 Member Function Documentation	215
6.165.3.1 operator[]	215
6.166Arc::MCCPluginArgument Class Reference	215
6.167Arc::MD5Sum Class Reference	215
6.167.1 Detailed Description	216
6.168Arc::MemoryAllocationException Class Reference	216
6.169Arc::Message Class Reference	216
6.169.1 Detailed Description	216
6.169.2 Constructor & Destructor Documentation	217
6.169.2.1 Message	217
6.169.2.2 Message	217
6.169.2.3 Message	217
6.169.2.4 ~Message	217
6.169.3 Member Function Documentation	217
6.169.3.1 Attributes	217
6.169.3.2 Auth	217
6.169.3.3 AuthContext	217
6.169.3.4 AuthContext	218
6.169.3.5 Context	218
6.169.3.6 Context	218
6.169.3.7 operator=	218
6.169.3.8 Payload	218
6.169.3.9 Payload	218
6.170Arc::MessageAttributes Class Reference	218
6.170.1 Detailed Description	219
6.170.2 Constructor & Destructor Documentation	219
6.170.2.1 MessageAttributes	219
6.170.3 Member Function Documentation	219
6.170.3.1 add	219
6.170.3.2 count	219
6.170.3.3 get	220
6.170.3.4 getAll	220

6.170.3.5 remove	220
6.170.3.6 removeAll	220
6.170.3.7 set	221
6.170.4 Field Documentation	221
6.170.4.1 attributes_	221
6.171Arc::MessageAuth Class Reference	221
6.171.1 Detailed Description	222
6.171.2 Member Function Documentation	222
6.171.2.1 Export	222
6.171.2.2 Filter	222
6.172Arc::MessageAuthContext Class Reference	222
6.172.1 Detailed Description	222
6.173Arc::MessageContext Class Reference	223
6.173.1 Detailed Description	223
6.173.2 Member Function Documentation	223
6.173.2.1 Add	223
6.174Arc::MessageContextElement Class Reference	223
6.174.1 Detailed Description	223
6.175Arc::MessagePayload Class Reference	224
6.175.1 Detailed Description	224
6.176Arc::ModuleDesc Class Reference	224
6.176.1 Detailed Description	224
6.177Arc::ModuleManager Class Reference	224
6.177.1 Detailed Description	225
6.177.2 Constructor & Destructor Documentation	225
6.177.2.1 ModuleManager	225
6.177.3 Member Function Documentation	225
6.177.3.1 find	225
6.177.3.2 findLocation	225
6.177.3.3 load	225
6.177.3.4 makePersistent	226
6.177.3.5 makePersistent	226
6.177.3.6 reload	226
6.177.3.7 setCfg	226
6.177.3.8 unload	226
6.177.3.9 unload	226

6.178Arc::MultiSecAttr Class Reference	226
6.178.1 Detailed Description	227
6.178.2 Member Function Documentation	227
6.178.2.1 Export	227
6.178.2.2 operator bool	227
6.179Arc::MySQLDatabase Class Reference	227
6.179.1 Detailed Description	228
6.179.2 Member Function Documentation	228
6.179.2.1 close	228
6.179.2.2 connect	228
6.179.2.3 enable_ssl	228
6.179.2.4 isconnected	228
6.179.2.5 shutdown	228
6.180Arc::MySQLQuery Class Reference	229
6.180.1 Member Function Documentation	229
6.180.1.1 execute	229
6.180.1.2 get_array	229
6.180.1.3 get_num_columns	230
6.180.1.4 get_num_rows	230
6.180.1.5 get_row	230
6.180.1.6 get_row	230
6.180.1.7 get_row_field	230
6.181Arc::NotificationType Class Reference	231
6.182Arc::NS Class Reference	231
6.183Arc::OAuthConsumer Class Reference	231
6.183.1 Detailed Description	231
6.183.2 Constructor & Destructor Documentation	232
6.183.2.1 OAuthConsumer	232
6.183.3 Member Function Documentation	232
6.183.3.1 approveCSR	232
6.183.3.2 parseDN	232
6.183.3.3 processLogin	232
6.183.3.4 pushCSR	232
6.183.3.5 storeCert	232
6.184Arc::OpenIdpClient Class Reference	232
6.184.1 Member Function Documentation	233

6.184.1.1 processConsent	233
6.184.1.2 processIdP2Confusa	233
6.184.1.3 processIdPLogin	233
6.185Arc::OptionParser Class Reference	233
6.186ArcSec::OrderedCombiningAlg Class Reference	234
6.187passwd Struct Reference	234
6.188Arc::PathIterator Class Reference	234
6.188.1 Detailed Description	234
6.188.2 Constructor & Destructor Documentation	234
6.188.2.1 PathIterator	234
6.188.3 Member Function Documentation	235
6.188.3.1 operator bool	235
6.188.3.2 operator*	235
6.188.3.3 operator++	235
6.188.3.4 operator--	235
6.188.3.5 Rest	235
6.189Arc::PayloadRaw Class Reference	235
6.189.1 Detailed Description	236
6.189.2 Constructor & Destructor Documentation	236
6.189.2.1 PayloadRaw	236
6.189.2.2 ~PayloadRaw	236
6.189.3 Member Function Documentation	236
6.189.3.1 Buffer	236
6.189.3.2 BufferPos	236
6.189.3.3 BufferSize	236
6.189.3.4 Content	236
6.189.3.5 Insert	237
6.189.3.6 Insert	237
6.189.3.7 operator[]	237
6.189.3.8 Size	237
6.189.3.9 Truncate	237
6.190Arc::PayloadRawBuf Struct Reference	237
6.190.1 Field Documentation	238
6.190.1.1 allocated	238
6.190.1.2 length	238
6.190.1.3 size	238

6.191Arc::PayloadRawInterface Class Reference	238
6.191.1 Detailed Description	239
6.191.2 Member Function Documentation	239
6.191.2.1 Buffer	239
6.191.2.2 BufferPos	239
6.191.2.3 BufferSize	239
6.191.2.4 Content	239
6.191.2.5 Insert	239
6.191.2.6 Insert	239
6.191.2.7 operator[]	240
6.191.2.8 Size	240
6.191.2.9 Truncate	240
6.192Arc::PayloadSOAP Class Reference	240
6.192.1 Detailed Description	240
6.192.2 Constructor & Destructor Documentation	241
6.192.2.1 PayloadSOAP	241
6.192.2.2 PayloadSOAP	241
6.192.2.3 PayloadSOAP	241
6.193Arc::PayloadStream Class Reference	241
6.193.1 Detailed Description	242
6.193.2 Constructor & Destructor Documentation	242
6.193.2.1 PayloadStream	242
6.193.2.2 ~PayloadStream	242
6.193.3 Member Function Documentation	242
6.193.3.1 Get	242
6.193.3.2 Get	242
6.193.3.3 Get	242
6.193.3.4 Limit	243
6.193.3.5 operator bool	243
6.193.3.6 operator!	243
6.193.3.7 Pos	243
6.193.3.8 Put	243
6.193.3.9 Put	243
6.193.3.10Put	243
6.193.3.11Size	244
6.193.3.12Timeout	244

6.193.3.13Timeout	244
6.193.4 Field Documentation	244
6.193.4.1 handle_	244
6.193.4.2 seekable_	244
6.194Arc::PayloadStreamInterface Class Reference	244
6.194.1 Detailed Description	245
6.194.2 Member Function Documentation	245
6.194.2.1 Get	245
6.194.2.2 Get	245
6.194.2.3 Get	245
6.194.2.4 Limit	245
6.194.2.5 operator bool	246
6.194.2.6 operator!	246
6.194.2.7 Pos	246
6.194.2.8 Put	246
6.194.2.9 Put	246
6.194.2.10Put	246
6.194.2.11Size	246
6.194.2.12Timeout	246
6.194.2.13Timeout	247
6.195Arc::PayloadWSRF Class Reference	247
6.195.1 Detailed Description	247
6.195.2 Constructor & Destructor Documentation	247
6.195.2.1 PayloadWSRF	247
6.195.2.2 PayloadWSRF	247
6.195.2.3 PayloadWSRF	248
6.196ArcSec::PDP Class Reference	248
6.196.1 Detailed Description	248
6.197ArcSec::PDPCfgContext Class Reference	248
6.198ArcSec::PDPluginArgument Class Reference	249
6.199Arc::Period Class Reference	249
6.199.1 Constructor & Destructor Documentation	249
6.199.1.1 Period	249
6.199.1.2 Period	249
6.199.1.3 Period	249
6.199.1.4 Period	250

6.199.2 Member Function Documentation	250
6.199.2.1 GetPeriod	250
6.199.2.2 istr	250
6.199.2.3 operator std::string	250
6.199.2.4 operator!=	250
6.199.2.5 operator<	250
6.199.2.6 operator<=	250
6.199.2.7 operator=	250
6.199.2.8 operator=	250
6.199.2.9 operator==	250
6.199.2.10 operator>	250
6.199.2.11 operator>=	251
6.199.2.12 SetPeriod	251
6.200 ArcSec::PeriodAttribute Class Reference	251
6.200.1 Detailed Description	251
6.200.2 Member Function Documentation	251
6.200.2.1 encode	251
6.200.2.2 equal	251
6.200.2.3 getId	252
6.200.2.4 getType	252
6.201 ArcSec::PermitOverridesCombiningAlg Class Reference	252
6.201.1 Detailed Description	252
6.201.2 Member Function Documentation	252
6.201.2.1 combine	252
6.201.2.2 getalgId	253
6.202 Arc::Plexer Class Reference	253
6.202.1 Detailed Description	254
6.202.2 Constructor & Destructor Documentation	254
6.202.2.1 Plexer	254
6.202.2.2 ~Plexer	254
6.202.3 Member Function Documentation	254
6.202.3.1 Next	254
6.202.3.2 process	254
6.202.4 Field Documentation	254
6.202.4.1 logger	254
6.203 Arc::PlexerEntry Class Reference	255

6.203.1 Detailed Description	255
6.204Arc::Plugin Class Reference	255
6.204.1 Detailed Description	256
6.205Arc::PluginArgument Class Reference	256
6.205.1 Detailed Description	257
6.205.2 Member Function Documentation	257
6.205.2.1 get_factory	257
6.205.2.2 get_module	257
6.206Arc::PluginDesc Class Reference	258
6.206.1 Detailed Description	258
6.207Arc::PluginDescriptor Struct Reference	258
6.207.1 Detailed Description	258
6.208Arc::PluginsFactory Class Reference	258
6.208.1 Detailed Description	259
6.208.2 Constructor & Destructor Documentation	259
6.208.2.1 PluginsFactory	259
6.208.3 Member Function Documentation	259
6.208.3.1 FilterByKind	259
6.208.3.2 load	259
6.208.3.3 report	260
6.208.3.4 scan	260
6.208.3.5 TryLoad	260
6.209ArcSec::Policy Class Reference	260
6.209.1 Detailed Description	261
6.209.2 Constructor & Destructor Documentation	261
6.209.2.1 Policy	261
6.209.2.2 Policy	261
6.209.3 Member Function Documentation	261
6.209.3.1 addPolicy	261
6.209.3.2 eval	261
6.209.3.3 getEffect	261
6.209.3.4 getEvalName	262
6.209.3.5 getEvalResult	262
6.209.3.6 getName	262
6.209.3.7 make_policy	262
6.209.3.8 setEvalResult	262

6.209.3.9 setEvaluatorContext	262
6.210ArcSec::PolicyStore::PolicyElement Class Reference	262
6.211ArcSec::PolicyParser Class Reference	262
6.211.1 Detailed Description	263
6.211.2 Member Function Documentation	263
6.211.2.1 parsePolicy	263
6.212ArcSec::PolicyStore Class Reference	263
6.212.1 Detailed Description	263
6.212.2 Constructor & Destructor Documentation	263
6.212.2.1 PolicyStore	263
6.213Arc::Printf< T0, T1, T2, T3, T4, T5, T6, T7 > Class Template Reference	264
6.214Arc::PrintFBase Class Reference	264
6.215Arc::Profile Class Reference	264
6.216ArcCredential::PROXYCERTINFO_st Struct Reference	265
6.217ArcCredential::PROXYPOLICY_st Struct Reference	265
6.218Arc::Query Class Reference	265
6.218.1 Constructor & Destructor Documentation	265
6.218.1.1 Query	265
6.218.1.2 Query	266
6.218.1.3 ~Query	266
6.218.2 Member Function Documentation	266
6.218.2.1 execute	266
6.218.2.2 get_array	266
6.218.2.3 get_num_columns	266
6.218.2.4 get_num_rows	266
6.218.2.5 get_row	267
6.218.2.6 get_row	267
6.218.2.7 get_row_field	267
6.219Arc::Range< T > Class Template Reference	267
6.220Arc::Register_Info_Type Struct Reference	268
6.221Arc::RegisteredService Class Reference	268
6.221.1 Detailed Description	268
6.221.2 Constructor & Destructor Documentation	268
6.221.2.1 RegisteredService	268
6.222Arc::RegularExpression Class Reference	268
6.222.1 Detailed Description	269

6.222.2 Member Function Documentation	269
6.222.2.1 match	269
6.223ArcSec::Request Class Reference	269
6.223.1 Detailed Description	270
6.223.2 Constructor & Destructor Documentation	270
6.223.2.1 Request	270
6.223.2.2 Request	270
6.223.3 Member Function Documentation	270
6.223.3.1 addRequestItem	270
6.223.3.2 getEvalName	270
6.223.3.3 getName	270
6.223.3.4 getRequestItems	271
6.223.3.5 make_request	271
6.223.3.6 setAttributeFactory	271
6.223.3.7 setRequestItems	271
6.224ArcSec::RequestAttribute Class Reference	271
6.224.1 Detailed Description	271
6.224.2 Constructor & Destructor Documentation	271
6.224.2.1 RequestAttribute	271
6.224.3 Member Function Documentation	272
6.224.3.1 duplicate	272
6.225ArcSec::RequestItem Class Reference	272
6.225.1 Detailed Description	272
6.225.2 Constructor & Destructor Documentation	272
6.225.2.1 RequestItem	272
6.226ArcSec::RequestTuple Class Reference	272
6.227Arc::ResourceSlotType Class Reference	273
6.228Arc::ResourcesType Class Reference	273
6.229Arc::ResourceTargetType Class Reference	273
6.230ArcSec::Response Class Reference	273
6.230.1 Detailed Description	273
6.231ArcSec::ResponseItem Class Reference	273
6.231.1 Detailed Description	273
6.232ArcSec::ResponseList Class Reference	274
6.233Arc::Run Class Reference	274
6.233.1 Detailed Description	274

6.233.2 Constructor & Destructor Documentation	275
6.233.2.1 Run	275
6.233.2.2 Run	275
6.233.2.3 ~Run	275
6.233.3 Member Function Documentation	275
6.233.3.1 Abandon	275
6.233.3.2 AfterFork	275
6.233.3.3 AssignStderr	275
6.233.3.4 AssignStdin	275
6.233.3.5 AssignStdout	275
6.233.3.6 AssignWorkingDirectory	275
6.233.3.7 CloseStderr	276
6.233.3.8 CloseStdin	276
6.233.3.9 CloseStdout	276
6.233.3.10KeepStderr	276
6.233.3.11KeepStdin	276
6.233.3.12KeepStdout	276
6.233.3.13Kill	276
6.233.3.14operator bool	276
6.233.3.15operator!	276
6.233.3.16ReadStderr	276
6.233.3.17ReadStdout	277
6.233.3.18Result	277
6.233.3.19Running	277
6.233.3.20Start	277
6.233.3.21Wait	277
6.233.3.22Wait	277
6.233.3.23WriteStdin	277
6.234Arc::SAML2LoginClient Class Reference	277
6.234.1 Constructor & Destructor Documentation	278
6.234.1.1 SAML2LoginClient	278
6.234.2 Member Function Documentation	278
6.234.2.1 findSimpleSAMLInstallation	278
6.234.2.2 processLogin	278
6.235Arc::SAML2SSOHTTPClient Class Reference	278
6.235.1 Member Function Documentation	279

6.235.1.1 approveCSR	279
6.235.1.2 parseDN	279
6.235.1.3 processConsent	279
6.235.1.4 processIdP2Confusa	279
6.235.1.5 processIdPLogin	279
6.235.1.6 processLogin	280
6.235.1.7 pushCSR	280
6.235.1.8 storeCert	280
6.236Arc::SAMLToken Class Reference	280
6.236.1 Detailed Description	280
6.236.2 Member Enumeration Documentation	281
6.236.2.1 SAMLVersion	281
6.236.3 Constructor & Destructor Documentation	281
6.236.3.1 SAMLToken	281
6.236.3.2 SAMLToken	282
6.236.3.3 ~SAMLToken	282
6.236.4 Member Function Documentation	282
6.236.4.1 Authenticate	282
6.236.4.2 Authenticate	282
6.236.4.3 operator bool	283
6.237Arc::ScalableTime< T > Class Template Reference	283
6.238Arc::ScalableTime< int > Class Template Reference	283
6.239Arc::SecAttr Class Reference	283
6.239.1 Detailed Description	284
6.239.2 Member Function Documentation	284
6.239.2.1 Export	284
6.239.2.2 Export	284
6.239.2.3 Import	284
6.239.2.4 operator bool	284
6.239.2.5 operator!=	284
6.239.2.6 operator==	285
6.240Arc::SecAttrFormat Class Reference	285
6.240.1 Detailed Description	285
6.241Arc::SecAttrValue Class Reference	285
6.241.1 Detailed Description	285
6.241.2 Member Function Documentation	286

6.241.2.1 operator bool	286
6.241.2.2 operator!=	286
6.241.2.3 operator==	286
6.242ArcSec::SecHandler Class Reference	286
6.242.1 Detailed Description	286
6.243ArcSec::SecHandlerConfig Class Reference	287
6.243.1 Detailed Description	287
6.244Arc::SecHandlerConfig Class Reference	287
6.245ArcSec::SecHandlerPluginArgument Class Reference	287
6.246ArcSec::Security Class Reference	288
6.246.1 Detailed Description	288
6.247Arc::Service Class Reference	288
6.247.1 Detailed Description	289
6.247.2 Constructor & Destructor Documentation	289
6.247.2.1 Service	289
6.247.3 Member Function Documentation	289
6.247.3.1 AddSecHandler	289
6.247.3.2 getID	289
6.247.3.3 ProcessSecHandlers	289
6.247.3.4 RegistrationCollector	290
6.247.4 Field Documentation	290
6.247.4.1 logger	290
6.247.4.2 sechandlers_	290
6.248Arc::ServicePluginArgument Class Reference	290
6.249Arc::SimpleCondition Class Reference	290
6.249.1 Detailed Description	291
6.249.2 Member Function Documentation	291
6.249.2.1 broadcast	291
6.249.2.2 lock	291
6.249.2.3 reset	291
6.249.2.4 signal	291
6.249.2.5 signal_nonblock	291
6.249.2.6 unlock	291
6.249.2.7 wait	291
6.249.2.8 wait	291
6.249.2.9 wait_nonblock	292

6.250Arc::SimpleCounter Class Reference	292
6.250.1 Member Function Documentation	292
6.250.1.1 wait	292
6.251Arc::SOAPMessage Class Reference	292
6.251.1 Detailed Description	292
6.251.2 Constructor & Destructor Documentation	293
6.251.2.1 SOAPMessage	293
6.251.2.2 SOAPMessage	293
6.251.2.3 SOAPMessage	293
6.251.2.4 ~SOAPMessage	293
6.251.3 Member Function Documentation	293
6.251.3.1 Attributes	293
6.251.3.2 Payload	293
6.251.3.3 Payload	293
6.252Arc::Software Class Reference	293
6.252.1 Detailed Description	294
6.252.2 Member Typedef Documentation	295
6.252.2.1 ComparisonOperator	295
6.252.3 Member Enumeration Documentation	295
6.252.3.1 ComparisonOperatorEnum	295
6.252.4 Constructor & Destructor Documentation	295
6.252.4.1 Software	295
6.252.4.2 Software	295
6.252.4.3 Software	296
6.252.4.4 Software	296
6.252.5 Member Function Documentation	296
6.252.5.1 convert	296
6.252.5.2 empty	297
6.252.5.3 getFamily	297
6.252.5.4 getName	297
6.252.5.5 getVersion	297
6.252.5.6 operator std::string	297
6.252.5.7 operator!=	298
6.252.5.8 operator()	298
6.252.5.9 operator<	298
6.252.5.10operator<=	299

6.252.5.1 operator==	299
6.252.5.12 operator>	299
6.252.5.13 operator>=	300
6.252.5.14 toString	300
6.252.6 Friends And Related Function Documentation	300
6.252.6.1 operator<<	300
6.252.7 Field Documentation	301
6.252.7.1 VERSIONTOKENS	301
6.253 Arc::SoftwareRequirement Class Reference	301
6.253.1 Detailed Description	301
6.253.2 Constructor & Destructor Documentation	302
6.253.2.1 SoftwareRequirement	302
6.253.2.2 SoftwareRequirement	302
6.253.2.3 SoftwareRequirement	302
6.253.2.4 SoftwareRequirement	303
6.253.3 Member Function Documentation	303
6.253.3.1 add	303
6.253.3.2 add	303
6.253.3.3 clear	303
6.253.3.4 empty	304
6.253.3.5 getComparisonOperatorList	304
6.253.3.6 getSoftwareList	304
6.253.3.7 isRequiringAll	304
6.253.3.8 isResolved	305
6.253.3.9 isSatisfied	305
6.253.3.10 isSatisfied	305
6.253.3.11 isSatisfied	306
6.253.3.12 operator=	306
6.253.3.13 selectSoftware	306
6.253.3.14 selectSoftware	307
6.253.3.15 selectSoftware	307
6.253.3.16 setRequirement	308
6.254 ArcSec::Source Class Reference	308
6.254.1 Detailed Description	309
6.254.2 Constructor & Destructor Documentation	309
6.254.2.1 Source	309

6.254.2.2 Source	309
6.255ArcSec::SourceFile Class Reference	309
6.255.1 Detailed Description	310
6.256ArcSec::SourceURL Class Reference	310
6.256.1 Detailed Description	310
6.257ArcSec::StringAttribute Class Reference	310
6.257.1 Member Function Documentation	311
6.257.1.1 encode	311
6.257.1.2 equal	311
6.257.1.3 getId	311
6.257.1.4 getType	311
6.258Arc::Submitter Class Reference	311
6.258.1 Detailed Description	312
6.258.2 Member Function Documentation	312
6.258.2.1 Migrate	312
6.258.2.2 Submit	312
6.259Arc::SubmitterLoader Class Reference	312
6.259.1 Detailed Description	313
6.259.2 Constructor & Destructor Documentation	313
6.259.2.1 SubmitterLoader	313
6.259.2.2 ~SubmitterLoader	313
6.259.3 Member Function Documentation	313
6.259.3.1 GetSubmitters	313
6.259.3.2 load	313
6.260Arc::SubmitterPluginArgument Class Reference	314
6.261Arc::TargetGenerator Class Reference	314
6.261.1 Detailed Description	315
6.261.2 Constructor & Destructor Documentation	315
6.261.2.1 TargetGenerator	315
6.261.3 Member Function Documentation	315
6.261.3.1 AddIndexServer	315
6.261.3.2 AddJob	315
6.261.3.3 AddJob	316
6.261.3.4 AddService	316
6.261.3.5 AddTarget	316
6.261.3.6 FoundJobs	316

6.261.3.7 FoundTargets	317
6.261.3.8 GetExecutionTargets	317
6.261.3.9 GetFoundJobs	317
6.261.3.10GetJobs	317
6.261.3.11GetTargets	317
6.261.3.12ModifyFoundTargets	318
6.261.3.13PrintTargetInfo	318
6.261.3.14SaveTargetInfoToStream	318
6.261.3.15ServiceCounter	318
6.262Arc::TargetRetriever Class Reference	319
6.262.1 Detailed Description	319
6.262.2 Constructor & Destructor Documentation	319
6.262.2.1 TargetRetriever	319
6.262.3 Member Function Documentation	320
6.262.3.1 GetExecutionTargets	320
6.262.3.2 GetJobs	320
6.262.3.3 GetTargets	320
6.263Arc::TargetRetrieverLoader Class Reference	320
6.263.1 Detailed Description	321
6.263.2 Constructor & Destructor Documentation	321
6.263.2.1 TargetRetrieverLoader	321
6.263.2.2 ~TargetRetrieverLoader	321
6.263.3 Member Function Documentation	321
6.263.3.1 GetTargetRetrievers	321
6.263.3.2 load	321
6.264Arc::TargetRetrieverPluginArgument Class Reference	322
6.265Test::TestMCC Class Reference	322
6.266Test::TestService Class Reference	323
6.266.1 Member Function Documentation	323
6.266.1.1 process	323
6.267Arc::ThreadDataItem Class Reference	323
6.267.1 Detailed Description	324
6.267.2 Constructor & Destructor Documentation	324
6.267.2.1 ThreadDataItem	324
6.267.2.2 ThreadDataItem	324
6.267.2.3 ThreadDataItem	324

6.267.3 Member Function Documentation	324
6.267.3.1 Attach	324
6.267.3.2 Attach	324
6.267.3.3 Dup	325
6.267.3.4 Get	325
6.268Arc::ThreadInitializer Class Reference	325
6.269Arc::ThreadRegistry Class Reference	325
6.269.1 Detailed Description	325
6.269.2 Member Function Documentation	325
6.269.2.1 WaitForExit	325
6.269.2.2 WaitOrCancel	326
6.270Arc::Time Class Reference	326
6.270.1 Detailed Description	326
6.270.2 Constructor & Destructor Documentation	327
6.270.2.1 Time	327
6.270.2.2 Time	327
6.270.2.3 Time	327
6.270.2.4 Time	327
6.270.3 Member Function Documentation	327
6.270.3.1 GetFormat	327
6.270.3.2 GetTime	327
6.270.3.3 operator std::string	327
6.270.3.4 operator!=	327
6.270.3.5 operator+	327
6.270.3.6 operator-	327
6.270.3.7 operator-	327
6.270.3.8 operator<	328
6.270.3.9 operator<=	328
6.270.3.10operator=	328
6.270.3.11operator=	328
6.270.3.12operator=	328
6.270.3.13operator=	328
6.270.3.14operator==	328
6.270.3.15operator>	328
6.270.3.16operator>=	328
6.270.3.17SetFormat	328

6.270.3.18	SetTime	328
6.270.3.19	SetTime	329
6.270.3.20	str	329
6.271	ArcSec::TimeAttribute Class Reference	329
6.271.1	Detailed Description	329
6.271.2	Member Function Documentation	329
6.271.2.1	encode	329
6.271.2.2	equal	329
6.271.2.3	getId	330
6.271.2.4	getType	330
6.272	Arc::TimedMutex Class Reference	330
6.273	Arc::URL Class Reference	330
6.273.1	Member Enumeration Documentation	332
6.273.1.1	Scope	332
6.273.2	Constructor & Destructor Documentation	332
6.273.2.1	URL	332
6.273.2.2	URL	332
6.273.2.3	~URL	332
6.273.3	Member Function Documentation	332
6.273.3.1	AddLDAPAttribute	332
6.273.3.2	AddMetaDataOption	332
6.273.3.3	AddOption	333
6.273.3.4	BaseDN2Path	333
6.273.3.5	ChangeHost	333
6.273.3.6	ChangeLDAPFilter	333
6.273.3.7	ChangeLDAPScope	333
6.273.3.8	ChangePath	333
6.273.3.9	ChangePort	333
6.273.3.10	ChangeProtocol	333
6.273.3.11	CommonLocOption	333
6.273.3.12	CommonLocOptions	333
6.273.3.13	ConnectionURL	334
6.273.3.14	FullPath	334
6.273.3.15	fullstr	334
6.273.3.16	Host	334
6.273.3.17	HTTPOption	334

6.273.3.18HTTPOptions	334
6.273.3.19IsSecureProtocol	334
6.273.3.20LDAPAttributes	334
6.273.3.21LDAPFilter	334
6.273.3.22LDAPScope	334
6.273.3.23Locations	335
6.273.3.24MetaDataOption	335
6.273.3.25MetaDataOptions	335
6.273.3.26operator bool	335
6.273.3.27operator<	335
6.273.3.28operator==	335
6.273.3.29Option	335
6.273.3.30Options	335
6.273.3.31OptionString	335
6.273.3.32ParseOptions	336
6.273.3.33Passwd	336
6.273.3.34Path	336
6.273.3.35Path2BaseDN	336
6.273.3.36plainstr	336
6.273.3.37Port	336
6.273.3.38Protocol	336
6.273.3.39str	336
6.273.3.40Username	336
6.273.4 Friends And Related Function Documentation	336
6.273.4.1 operator<<	336
6.273.5 Field Documentation	337
6.273.5.1 commonlocoptions	337
6.273.5.2 host	337
6.273.5.3 httpoptions	337
6.273.5.4 ip6addr	337
6.273.5.5 ldapattributes	337
6.273.5.6 ldapfilter	337
6.273.5.7 ldapscope	337
6.273.5.8 locations	337
6.273.5.9 metadataoptions	337
6.273.5.10passwd	337

6.273.5.1	lpath	337
6.273.5.2	port	338
6.273.5.3	protocol	338
6.273.5.4	urloptions	338
6.273.5.5	username	338
6.273.5.6	valid	338
6.274	Arc::URLLocation Class Reference	338
6.274.1	Detailed Description	339
6.274.2	Constructor & Destructor Documentation	339
6.274.2.1	URLLocation	339
6.274.2.2	URLLocation	339
6.274.2.3	URLLocation	339
6.274.2.4	URLLocation	339
6.274.2.5	URLLocation	339
6.274.2.6	~URLLocation	339
6.274.3	Member Function Documentation	339
6.274.3.1	fullstr	339
6.274.3.2	Name	339
6.274.3.3	str	340
6.274.4	Field Documentation	340
6.274.4.1	name	340
6.275	Arc::URLMap Class Reference	340
6.276	Arc::User Class Reference	340
6.277	Arc::UserConfig Class Reference	340
6.277.1	Detailed Description	342
6.277.2	Constructor & Destructor Documentation	343
6.277.2.1	UserConfig	343
6.277.2.2	UserConfig	344
6.277.2.3	UserConfig	344
6.277.2.4	UserConfig	345
6.277.3	Member Function Documentation	345
6.277.3.1	AddBartender	345
6.277.3.2	AddServices	345
6.277.3.3	AddServices	346
6.277.3.4	ApplyToConfig	347
6.277.3.5	Bartender	347

6.277.3.6 Bartender	347
6.277.3.7 Broker	348
6.277.3.8 Broker	348
6.277.3.9 Broker	349
6.277.3.10CACertificatePath	349
6.277.3.11CACertificatePath	349
6.277.3.12CACertificatesDirectory	349
6.277.3.13CACertificatesDirectory	350
6.277.3.14CertificateLifeTime	350
6.277.3.15CertificateLifeTime	351
6.277.3.16CertificatePath	351
6.277.3.17CertificatePath	351
6.277.3.18ClearRejectedServices	352
6.277.3.19ClearRejectedServices	352
6.277.3.20ClearSelectedServices	352
6.277.3.21ClearSelectedServices	352
6.277.3.22CredentialsFound	353
6.277.3.23GetRejectedServices	353
6.277.3.24GetSelectedServices	353
6.277.3.25IdPName	354
6.277.3.26IdPName	354
6.277.3.27InitializeCredentials	354
6.277.3.28JobListFile	355
6.277.3.29JobListFile	356
6.277.3.30KeyPassword	356
6.277.3.31KeyPassword	356
6.277.3.32KeyPath	357
6.277.3.33KeyPath	357
6.277.3.34KeySize	358
6.277.3.35KeySize	358
6.277.3.36LoadConfigurationFile	358
6.277.3.37operator bool	360
6.277.3.38operator!	360
6.277.3.39OverlayFile	360
6.277.3.40OverlayFile	360
6.277.3.41Password	361

6.277.3.42	Password	361
6.277.3.43	ProxyPath	361
6.277.3.44	ProxyPath	362
6.277.3.45	SaveToFile	362
6.277.3.46	SLCS	362
6.277.3.47	SLCS	363
6.277.3.48	StoreDirectory	363
6.277.3.49	StoreDirectory	363
6.277.3.50	Timeout	364
6.277.3.51	Timeout	364
6.277.3.52	UserName	364
6.277.3.53	UserName	365
6.277.3.54	UtilsDirPath	365
6.277.3.55	UtilsDirPath	365
6.277.3.56	Verbosity	365
6.277.3.57	Verbosity	366
6.277.3.58	VOMSServerPath	366
6.277.3.59	VOMSServerPath	366
6.277.4	Field Documentation	367
6.277.4.1	ARCUSERDIRECTORY	367
6.277.4.2	DEFAULT_BROKER	367
6.277.4.3	DEFAULT_TIMEOUT	367
6.277.4.4	DEFAULTCONFIG	367
6.277.4.5	EXAMPLECONFIG	367
6.277.4.6	SYSCONFIG	368
6.277.4.7	SYSCONFIGARCLOC	368
6.278Arc::UsernameToken	Class Reference	368
6.278.1	Detailed Description	368
6.278.2	Member Enumeration Documentation	368
6.278.2.1	PasswordType	368
6.278.3	Constructor & Destructor Documentation	369
6.278.3.1	UsernameToken	369
6.278.3.2	UsernameToken	369
6.278.3.3	UsernameToken	369
6.278.4	Member Function Documentation	369
6.278.4.1	Authenticate	369

6.278.4.2 Authenticate	369
6.278.4.3 operator bool	370
6.278.4.4 Username	370
6.279Arc::UserSwitch Class Reference	370
6.279.1 Detailed Description	370
6.280Arc::VOMSTrustList Class Reference	370
6.280.1 Detailed Description	370
6.280.2 Constructor & Destructor Documentation	371
6.280.2.1 VOMSTrustList	371
6.280.2.2 VOMSTrustList	371
6.280.3 Member Function Documentation	371
6.280.3.1 AddChain	371
6.280.3.2 AddChain	371
6.280.3.3 AddRegex	372
6.281Arc::WSAEndpointReference Class Reference	372
6.281.1 Detailed Description	372
6.281.2 Constructor & Destructor Documentation	372
6.281.2.1 WSAEndpointReference	372
6.281.2.2 WSAEndpointReference	372
6.281.2.3 WSAEndpointReference	372
6.281.2.4 WSAEndpointReference	373
6.281.2.5 ~WSAEndpointReference	373
6.281.3 Member Function Documentation	373
6.281.3.1 Address	373
6.281.3.2 Address	373
6.281.3.3 MetaData	373
6.281.3.4 operator XMLNode	373
6.281.3.5 operator=	373
6.281.3.6 ReferenceParameters	373
6.282Arc::WSAHeader Class Reference	373
6.282.1 Detailed Description	374
6.282.2 Constructor & Destructor Documentation	374
6.282.2.1 WSAHeader	374
6.282.2.2 WSAHeader	374
6.282.3 Member Function Documentation	375
6.282.3.1 Action	375

6.282.3.2 Action	375
6.282.3.3 Check	375
6.282.3.4 FaultTo	375
6.282.3.5 From	375
6.282.3.6 MessageID	375
6.282.3.7 MessageID	375
6.282.3.8 NewReferenceParameter	375
6.282.3.9 operator XMLNode	375
6.282.3.10ReferenceParameter	375
6.282.3.11ReferenceParameter	375
6.282.3.12RelatesTo	376
6.282.3.13RelatesTo	376
6.282.3.14RelationshipType	376
6.282.3.15RelationshipType	376
6.282.3.16ReplyTo	376
6.282.3.17To	376
6.282.3.18To	376
6.282.4 Field Documentation	376
6.282.4.1 header_allocated_	376
6.283Arc::WSRF Class Reference	376
6.283.1 Detailed Description	377
6.283.2 Constructor & Destructor Documentation	377
6.283.2.1 WSRF	377
6.283.2.2 WSRF	378
6.283.3 Member Function Documentation	378
6.283.3.1 operator bool	378
6.283.3.2 set_namespaces	378
6.283.3.3 SOAP	378
6.283.4 Field Documentation	378
6.283.4.1 allocated_	378
6.283.4.2 valid_	378
6.284Arc::WSRFBBaseFault Class Reference	378
6.284.1 Detailed Description	379
6.284.2 Constructor & Destructor Documentation	379
6.284.2.1 WSRFBBaseFault	379
6.284.2.2 WSRFBBaseFault	379

6.284.3 Member Function Documentation	379
6.284.3.1 set_namespaces	379
6.285Arc::WSRFResourceUnavailableFault Class Reference	379
6.286Arc::WSRFResourceUnknownFault Class Reference	380
6.287Arc::WSRP Class Reference	380
6.287.1 Detailed Description	381
6.287.2 Constructor & Destructor Documentation	381
6.287.2.1 WSRP	381
6.287.2.2 WSRP	382
6.287.3 Member Function Documentation	382
6.287.3.1 set_namespaces	382
6.288Arc::WSRPDeleteResourceProperties Class Reference	382
6.289Arc::WSRPDeleteResourcePropertiesRequest Class Reference	382
6.290Arc::WSRPDeleteResourcePropertiesRequestFailedFault Class Reference	383
6.291Arc::WSRPDeleteResourcePropertiesResponse Class Reference	383
6.292Arc::WSRPFault Class Reference	383
6.292.1 Detailed Description	384
6.292.2 Constructor & Destructor Documentation	384
6.292.2.1 WSRPFault	384
6.292.2.2 WSRPFault	384
6.293Arc::WSRPGetMultipleResourcePropertiesRequest Class Reference	384
6.294Arc::WSRPGetMultipleResourcePropertiesResponse Class Reference	385
6.295Arc::WSRPGetResourcePropertyDocumentRequest Class Reference	385
6.296Arc::WSRPGetResourcePropertyDocumentResponse Class Reference	385
6.297Arc::WSRPGetResourcePropertyRequest Class Reference	386
6.298Arc::WSRPGetResourcePropertyResponse Class Reference	386
6.299Arc::WSRPInsertResourceProperties Class Reference	387
6.300Arc::WSRPInsertResourcePropertiesRequest Class Reference	387
6.301Arc::WSRPInsertResourcePropertiesRequestFailedFault Class Reference	387
6.302Arc::WSRPInsertResourcePropertiesResponse Class Reference	388
6.303Arc::WSRPInvalidModificationFault Class Reference	388
6.304Arc::WSRPInvalidResourcePropertyQNameFault Class Reference	389
6.305Arc::WSRPModifyResourceProperties Class Reference	389
6.306Arc::WSRPPutResourcePropertyDocumentRequest Class Reference	390
6.307Arc::WSRPPutResourcePropertyDocumentResponse Class Reference	390
6.308Arc::WSRPQueryResourcePropertiesRequest Class Reference	390

6.309Arc::WSRPQueryResourcePropertiesResponse Class Reference	391
6.310Arc::WSRPResourcePropertyChangeFailure Class Reference	391
6.310.1 Detailed Description	392
6.310.2 Constructor & Destructor Documentation	392
6.310.2.1 WSRPResourcePropertyChangeFailure	392
6.310.2.2 WSRPResourcePropertyChangeFailure	392
6.311Arc::WSRPSetResourcePropertiesRequest Class Reference	392
6.312Arc::WSRPSetResourcePropertiesResponse Class Reference	392
6.313Arc::WSRPSetResourcePropertyRequestFailedFault Class Reference	393
6.314Arc::WSRPUnableToModifyResourcePropertyFault Class Reference	393
6.315Arc::WSRPUnableToPutResourcePropertyDocumentFault Class Reference	394
6.316Arc::WSRPUpdateResourceProperties Class Reference	394
6.317Arc::WSRPUpdateResourcePropertiesRequest Class Reference	394
6.318Arc::WSRPUpdateResourcePropertiesRequestFailedFault Class Reference	395
6.319Arc::WSRPUpdateResourcePropertiesResponse Class Reference	395
6.320ArcSec::X500NameAttribute Class Reference	396
6.320.1 Member Function Documentation	396
6.320.1.1 encode	396
6.320.1.2 equal	396
6.320.1.3 getId	396
6.320.1.4 getType	396
6.321Arc::X509Token Class Reference	397
6.321.1 Detailed Description	397
6.321.2 Member Enumeration Documentation	397
6.321.2.1 X509TokenType	397
6.321.3 Constructor & Destructor Documentation	397
6.321.3.1 X509Token	397
6.321.3.2 X509Token	397
6.321.3.3 ~X509Token	398
6.321.4 Member Function Documentation	398
6.321.4.1 Authenticate	398
6.321.4.2 Authenticate	398
6.321.4.3 operator bool	398
6.322Arc::XmlContainer Class Reference	398
6.323Arc::XmlDatabase Class Reference	399
6.324Arc::XMLNode Class Reference	399

6.324.1 Detailed Description	401
6.324.2 Constructor & Destructor Documentation	401
6.324.2.1 XMLNode	401
6.324.2.2 XMLNode	401
6.324.2.3 XMLNode	401
6.324.2.4 XMLNode	401
6.324.2.5 XMLNode	402
6.324.2.6 XMLNode	402
6.324.2.7 XMLNode	402
6.324.2.8 ~XMLNode	402
6.324.3 Member Function Documentation	402
6.324.3.1 Attribute	402
6.324.3.2 Attribute	402
6.324.3.3 Attribute	402
6.324.3.4 AttributesSize	402
6.324.3.5 Child	402
6.324.3.6 Destroy	403
6.324.3.7 Exchange	403
6.324.3.8 FullName	403
6.324.3.9 Get	403
6.324.3.10GetDoc	403
6.324.3.11GetRoot	403
6.324.3.12GetXML	403
6.324.3.13GetXML	403
6.324.3.14Move	404
6.324.3.15Name	404
6.324.3.16Name	404
6.324.3.17Name	404
6.324.3.18Namespace	404
6.324.3.19NamespacePrefix	404
6.324.3.20Namespaces	404
6.324.3.21Namespaces	404
6.324.3.22New	404
6.324.3.23NewAttribute	405
6.324.3.24NewAttribute	405
6.324.3.25NewChild	405

6.324.3.26NewChild	405
6.324.3.27NewChild	405
6.324.3.28NewChild	405
6.324.3.29NewChild	405
6.324.3.30operator bool	405
6.324.3.31operator std::string	406
6.324.3.32operator!	406
6.324.3.33operator!=	406
6.324.3.34operator!=	406
6.324.3.35operator!=	406
6.324.3.36operator!=	406
6.324.3.37operator++	406
6.324.3.38operator--	406
6.324.3.39operator=	406
6.324.3.40operator=	406
6.324.3.41operator=	407
6.324.3.42operator==	407
6.324.3.43operator==	407
6.324.3.44operator==	407
6.324.3.45operator==	407
6.324.3.46operator[]	407
6.324.3.47operator[]	407
6.324.3.48operator[]	407
6.324.3.49Parent	408
6.324.3.50Path	408
6.324.3.51Prefix	408
6.324.3.52ReadFromFile	408
6.324.3.53ReadFromStream	408
6.324.3.54Replace	408
6.324.3.55Same	408
6.324.3.56SaveToFile	408
6.324.3.57SaveToStream	408
6.324.3.58Set	408
6.324.3.59Size	409
6.324.3.60Swap	409
6.324.3.61Validate	409

6.324.3.62XPathLookup	409
6.324.4 Friends And Related Function Documentation	409
6.324.4.1 MatchXMLName	409
6.324.4.2 MatchXMLName	409
6.324.4.3 MatchXMLName	409
6.324.4.4 MatchXMLNamespace	409
6.324.4.5 MatchXMLNamespace	410
6.324.4.6 MatchXMLNamespace	410
6.324.5 Field Documentation	410
6.324.5.1 is_owner_	410
6.324.5.2 is_temporary_	410
6.325Arc::XMLNodeContainer Class Reference	410
6.325.1 Detailed Description	410
6.325.2 Constructor & Destructor Documentation	411
6.325.2.1 XMLNodeContainer	411
6.325.2.2 XMLNodeContainer	411
6.325.3 Member Function Documentation	411
6.325.3.1 Add	411
6.325.3.2 Add	411
6.325.3.3 AddNew	411
6.325.3.4 AddNew	411
6.325.3.5 Nodes	411
6.325.3.6 operator=	411
6.325.3.7 operator[]	411
6.325.3.8 Size	411
6.326Arc::XMLSecNode Class Reference	412
6.326.1 Detailed Description	412
6.326.2 Constructor & Destructor Documentation	412
6.326.2.1 XMLSecNode	412
6.326.3 Member Function Documentation	412
6.326.3.1 AddSignatureTemplate	412
6.326.3.2 DecryptNode	413
6.326.3.3 EncryptNode	413
6.326.3.4 SignNode	413
6.326.3.5 VerifyNode	413

7.1	URL.h File Reference	415
7.1.1	Detailed Description	416
7.1.2	Define Documentation	416
7.1.2.1	RC_DEFAULT_PORT	416

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	43

Chapter 2

Data Structure Index

2.1 Class Hierarchy

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

ArcCredential::ACACI	45
ArcCredential::ACATTHOLDER	45
ArcCredential::ACATTR	45
ArcCredential::ACATTRIBUTE	45
ArcCredential::ACC	45
ArcCredential::ACCERTS	46
ArcCredential::ACDIGEST	46
ArcCredential::ACFORM	46
ArcCredential::ACFULLATTRIBUTES	46
ArcCredential::ACHOLDER	46
ArcCredential::ACIETFATTR	46
ArcCredential::ACINFO	46
ArcCredential::ACIS	47
ArcCredential::ACSEQ	47
ArcCredential::ACTARGET	47
ArcCredential::ACTARGETS	47
ArcCredential::ACVAL	47
Arc::ApplicationType	50
Arc::ArcLocation	50
ArcSec::ArcPeriod	51
ArcSec::Attr	51
Arc::AttributeIterator	52
ArcSec::AttributeProxy	55
ArcSec::AttributeValue	56
ArcSec::AnyURIAttribute	49
ArcSec::BooleanAttribute	61
ArcSec::DateAttribute	134
ArcSec::DateTimeAttribute	135
ArcSec::DurationAttribute	146
ArcSec::GenericAttribute	167
ArcSec::PeriodAttribute	251
ArcSec::StringAttribute	310
ArcSec::TimeAttribute	329

ArcSec::X500NameAttribute	396
ArcSec::Attr	57
ArcSec::AuthzRequest	58
ArcSec::AuthzRequestSection	58
Arc::AutoPointer< T >	58
Arc::Base64	59
Arc::BaseConfig	59
Arc::MCCCConfig	212
Arc::ByteArray	65
Arc::CacheParameters	65
ArcCredential::cert_verify_context	65
Arc::CertEnvLocker	65
Arc::ChainContext	65
Arc::Checksum	66
Arc::Adler32Sum	47
Arc::ChecksumAny	66
Arc::CRC32Sum	88
Arc::MD5Sum	215
Arc::ClientHTTPwithSAML2SSO	69
Arc::ClientInterface	70
Arc::ClientTCP	73
Arc::ClientHTTP	69
Arc::ClientSOAP	70
Arc::ClientSOAPwithSAML2SSO	72
Arc::ClientX509Delegation	73
ArcSec::CombiningAlg	75
ArcSec::DenyOverridesCombiningAlg	143
ArcSec::OrderedCombiningAlg	234
ArcSec::PermitOverridesCombiningAlg	252
Arc::ConfusaCertHandler	77
Arc::ConfusaParserUtils	78
Arc::CountedPointer< T >	80
Arc::Counter	80
Arc::IntraProcessCounter	179
Arc::CounterTicket	87
Arc::Credential	89
Arc::CredentialError	97
Arc::CredentialStore	97
Arc::Database	98
Arc::MySQLDatabase	227
Arc::DataBuffer	100
Arc::DataCallback	105
Arc::DataHandle	105
Arc::DataMover	106
Arc::DataSourceType	128
Arc::DataSpeed	128
Arc::DataStagingType	131
Arc::DataStatus	132
Arc::DataTargetType	133
Arc::DataType	133
Arc::DirectoryType	145

Arc::FileType	165
Arc::DBranch	136
Arc::DelegationConsumer	136
Arc::DelegationConsumerSOAP	138
Arc::DelegationContainerSOAP	139
Arc::DelegationProvider	140
Arc::DelegationProviderSOAP	141
Arc::DiskSpaceRequirementType	145
Arc::DItem	145
Arc::DItemString	145
ArcSec::EvalResult	148
ArcSec::EvaluationCtx	148
ArcSec::EvaluatorContext	152
ArcSec::EvaluatorLoader	152
Arc::ExecutableType	154
Arc::ExecutionTarget	154
Arc::ExpirationReminder	157
Arc::FileCache	158
FileCacheHash	163
Arc::FileInfo	164
Arc::FileLock	164
Arc::FinderLoader	165
ArcSec::Function	166
ArcSec::EqualFunction	147
ArcSec::InRangeFunction	179
ArcSec::MatchFunction	206
Arc::GlobusResult	168
Arc::GSSCredential	168
Arc::HTTPClientInfo	169
Arc::InfoCache	169
Arc::InfoFilter	170
Arc::InfoRegister	171
Arc::InfoRegisterContainer	172
Arc::InfoRegisters	173
Arc::InfoRegistrar	173
Arc::InformationInterface	175
Arc::InfoCacheInterface	170
Arc::InformationContainer	174
Arc::InformationRequest	176
Arc::InformationResponse	178
Arc::initializeCredentialsType	179
Arc::ISIS_description	184
Arc::IString	184
Arc::JobDescriptionParserLoader::iterator	184
Arc::Job	184
Arc::JobDescription	191
Arc::JobIdentificationType	193
Arc::JobMetaType	193
Arc::JobState	194
Arc::JobSupervisor	194
Arc::LoadableModuleDescription	195
Arc::Loader	195

Arc::BrokerLoader	63
Arc::DataPointLoader	128
Arc::JobControllerLoader	189
Arc::JobDescriptionParserLoader	192
Arc::MCCLoader	214
Arc::SubmitterLoader	312
Arc::TargetRetrieverLoader	320
Arc::LogDestination	196
Arc::LogFile	197
Arc::LogStream	205
Arc::Logger	199
Arc::LoggerContext	203
Arc::LoggerFormat	203
Arc::LogMessage	203
Arc::MCC_Status	210
Arc::MemoryAllocationException	216
Arc::Message	216
Arc::MessageAttributes	218
Arc::MessageAuth	221
Arc::MessageAuthContext	222
Arc::MessageContext	223
Arc::MessageContextElement	223
ArcSec::PDPCConfigContext	248
Arc::MessagePayload	224
Arc::PayloadRawInterface	238
Arc::PayloadRaw	235
Arc::PayloadSOAP	240
Arc::PayloadStreamInterface	244
Arc::PayloadStream	241
Arc::PayloadWSRF	247
Arc::ModuleDesc	224
Arc::ModuleManager	224
Arc::PluginsFactory	258
Arc::ClassLoader	68
Arc::NotificationType	231
Arc::NS	231
Arc::OptionParser	233
passwd	234
Arc::PathIterator	234
Arc::PayloadRawBuf	237
Arc::Period	249
Arc::PlexerEntry	255
Arc::Plugin	255
Arc::Broker	62
Arc::DataPoint	108
Arc::DataPointDirect	117
Arc::DataPointIndex	122
Arc::JobController	186
Arc::JobDescriptionParser	192
Arc::MCCInterface	213
Arc::MCC	207

Arc::Plexer	253
Test::TestMCC	322
Test::TestMCC	322
Arc::Service	288
Arc::RegisteredService	268
Test::TestService	323
Arc::Submitter	311
Arc::TargetRetriever	319
ArcSec::AlgFactory	48
ArcSec::AttributeFactory	52
ArcSec::Evaluator	149
ArcSec::FnFactory	165
ArcSec::PDP	248
ArcSec::Policy	260
ArcSec::Request	269
ArcSec::SecHandler	286
Arc::PluginArgument	256
Arc::BrokerPluginArgument	64
Arc::ClassLoaderPluginArgument	68
Arc::DataPointPluginArgument	128
Arc::JobControllerPluginArgument	190
Arc::MCCPluginArgument	215
Arc::ServicePluginArgument	290
Arc::SubmitterPluginArgument	314
Arc::TargetRetrieverPluginArgument	322
ArcSec::PDPPPluginArgument	249
ArcSec::SecHandlerPluginArgument	287
Arc::PluginDesc	258
Arc::PluginDescriptor	258
ArcSec::PolicyStore::PolicyElement	262
ArcSec::PolicyParser	262
ArcSec::PolicyStore	263
Arc::PrintFBase	264
Arc::PrintF< T0, T1, T2, T3, T4, T5, T6, T7 >	264
ArcCredential::PROXYCERTINFO_st	265
ArcCredential::PROXYPOLICY_st	265
Arc::Query	265
Arc::MySQLQuery	229
Arc::Range< T >	267
Arc::Register_Info_Type	268
Arc::RegularExpression	268
ArcSec::RequestAttribute	271
ArcSec::RequestItem	272
ArcSec::RequestTuple	272
Arc::ResourceSlotType	273
Arc::ResourcesType	273
Arc::ResourceTargetType	273
ArcSec::Response	273
ArcSec::ResponseItem	273
ArcSec::ResponseList	274
Arc::Run	274
Arc::SAML2LoginClient	277

Arc::OAuthConsumer	231
Arc::SAML2SSOHTTPClient	278
Arc::HakaClient	168
Arc::OpenIdpClient	232
Arc::SAMLToken	280
Arc::ScalableTime< T >	283
Arc::ScalableTime< int >	283
Arc::SecAttr	283
Arc::MultiSecAttr	226
Arc::SecAttrFormat	285
Arc::SecAttrValue	285
Arc::CIStrngValue	67
ArcSec::Security	288
Arc::SimpleCondition	290
Arc::SimpleCounter	292
Arc::SOAPMessage	292
Arc::Software	293
Arc::ApplicationEnvironment	50
Arc::SoftwareRequirement	301
ArcSec::Source	308
ArcSec::SourceFile	309
ArcSec::SourceURL	310
Arc::TargetGenerator	314
Arc::ThreadDataItem	323
Arc::ThreadInitializer	325
Arc::ThreadRegistry	325
Arc::Time	326
Arc::TimedMutex	330
Arc::URL	330
Arc::URLLocation	338
Arc::URLMap	340
Arc::User	340
Arc::UserConfig	340
Arc::UsernameToken	368
Arc::UserSwitch	370
Arc::VOMSTrustList	370
Arc::WSAEndpointReference	372
Arc::WSAHeader	373
Arc::WSRF	376
Arc::WSRFBBaseFault	378
Arc::WSRFResourceUnavailableFault	379
Arc::WSRFResourceUnknownFault	380
Arc::WSRPFault	383
Arc::WSRPInvalidResourcePropertyQNameFault	389
Arc::WSRPResourcePropertyChangeFailure	391
Arc::WSRPDeleteResourcePropertiesRequestFailedFault	383
Arc::WSRPInsertResourcePropertiesRequestFailedFault	387
Arc::WSRPInvalidModificationFault	388
Arc::WSRPSetResourcePropertyRequestFailedFault	393
Arc::WSRPUnableToModifyResourcePropertyFault	393
Arc::WSRPUnableToPutResourcePropertyDocumentFault	394
Arc::WSRPUpdateResourcePropertiesRequestFailedFault	395

Arc::WSRP	380
Arc::WSRPDeleteResourcePropertiesRequest	382
Arc::WSRPDeleteResourcePropertiesResponse	383
Arc::WSRPGetMultipleResourcePropertiesRequest	384
Arc::WSRPGetMultipleResourcePropertiesResponse	385
Arc::WSRPGetResourcePropertyDocumentRequest	385
Arc::WSRPGetResourcePropertyDocumentResponse	385
Arc::WSRPGetResourcePropertyRequest	386
Arc::WSRPGetResourcePropertyResponse	386
Arc::WSRPInsertResourcePropertiesRequest	387
Arc::WSRPInsertResourcePropertiesResponse	388
Arc::WSRPPutResourcePropertyDocumentRequest	390
Arc::WSRPPutResourcePropertyDocumentResponse	390
Arc::WSRPQueryResourcePropertiesRequest	390
Arc::WSRPQueryResourcePropertiesResponse	391
Arc::WSRPSetResourcePropertiesRequest	392
Arc::WSRPSetResourcePropertiesResponse	392
Arc::WSRPUpdateResourcePropertiesRequest	394
Arc::WSRPUpdateResourcePropertiesResponse	395
Arc::WSRPModifyResourceProperties	389
Arc::WSRPDeleteResourceProperties	382
Arc::WSRPInsertResourceProperties	387
Arc::WSRPUpdateResourceProperties	394
Arc::X509Token	397
Arc::XmlContainer	398
Arc::XmlDatabase	399
Arc::XMLNode	399
Arc::Config	76
Arc::IniConfig	178
Arc::Profile	264
Arc::SecHandlerConfig	287
Arc::ARCPolicyHandlerConfig	51
Arc::DNListHandlerConfig	146
Arc::XMLSecNode	412
ArcSec::SecHandlerConfig	287
Arc::XMLNodeContainer	410

Chapter 3

Data Structure Index

3.1 Data Structures

Here are the data structures with brief descriptions:

ArcCredential::ACACI	45
ArcCredential::ACATTHOLDER	45
ArcCredential::ACATTR	45
ArcCredential::ACATTRIBUTE	45
ArcCredential::ACC	45
ArcCredential::ACCERTS	46
ArcCredential::ACDIGEST	46
ArcCredential::ACFORM	46
ArcCredential::ACFULLATTRIBUTES	46
ArcCredential::ACHOLDER	46
ArcCredential::ACIETFATTR	46
ArcCredential::ACINFO	46
ArcCredential::ACIS	47
ArcCredential::ACSEQ	47
ArcCredential::ACTARGET	47
ArcCredential::ACTARGETS	47
ArcCredential::ACVAL	47
Arc::Adler32Sum (Implementation of Adler32 checksum)	47
ArcSec::AlgFactory (Interface for algorithm factory class)	48
ArcSec::AnyURIAttribute	49
Arc::ApplicationEnvironment (ApplicationEnvironment (p. 50))	50
Arc::ApplicationType	50
Arc::ArcLocation (Determines ARC installation location)	50
ArcSec::ArcPeriod	51
Arc::ARCPolicyHandlerConfig	51
ArcSec::Attr (Attr (p. 51) contains a tuple of attribute type and value)	51
ArcSec::AttributeFactory	52
Arc::AttributeIterator (A const iterator class for accessing multiple values of an attribute)	52
ArcSec::AttributeProxy (Interface for creating the AttributeValue (p. 56) object, it will be used by AttributeFactory (p. 52))	55
ArcSec::AttributeValue (Interface for containing different type of <Attribute> node for both policy and request)	56
ArcSec::Attrs (Attrs (p. 57) is a container for one or more Attr (p. 51))	57

ArcSec::AuthzRequest	58
ArcSec::AuthzRequestSection	58
Arc::AutoPointer< T > (Wrapper for pointer with automatic destruction)	58
Arc::Base64	59
Arc::BaseConfig	59
ArcSec::BooleanAttribute	61
Arc::Broker	62
Arc::BrokerLoader	63
Arc::BrokerPluginArgument	64
Arc::ByteArray	65
Arc::CacheParameters	65
ArcCredential::cert_verify_context	65
Arc::CertEnvLocker	65
Arc::ChainContext (Interface to chain specific functionality)	65
Arc::Checksum (Defines interface for variuos checksum manipulations)	66
Arc::ChecksumAny (Wrapper for Checksum (p. 66) class)	66
Arc::CStringValue (This class implements case insensitive strings as security attributes)	67
Arc::ClassLoader	68
Arc::ClassLoaderPluginArgument	68
Arc::ClientHTTP (Class for setting up a MCC (p. 207) chain for HTTP communication)	69
Arc::ClientHTTPwithSAML2SSO	69
Arc::ClientInterface (Utility base class for MCC (p. 207))	70
Arc::ClientSOAP	70
Arc::ClientSOAPwithSAML2SSO	72
Arc::ClientTCP (Class for setting up a MCC (p. 207) chain for TCP communication)	73
Arc::ClientX509Delegation	73
ArcSec::CombiningAlg (Interface for combining algorithm)	75
Arc::Config (Configuration element - represents (sub)tree of ARC configuration)	76
Arc::ConfusaCertHandler	77
Arc::ConfusaParserUtils	78
Arc::CountedPointer< T > (Wrapper for pointer with automatic destruction and mutiple references)	80
Arc::Counter (A class defining a common interface for counters)	80
Arc::CounterTicket (A class for "tickets" that correspond to counter reservations)	87
Arc::CRC32Sum (Implementation of CRC32 checksum)	88
Arc::Credential	89
Arc::CredentialError	97
Arc::CredentialStore	97
Arc::Database (Interface for calling database client library)	98
Arc::DataBuffer (Represents set of buffers)	100
Arc::DataCallback	105
Arc::DataHandle (This class is a wrapper around the DataPoint (p. 108) class)	105
Arc::DataMover	106
Arc::DataPoint (This base class is an abstraction of URL (p. 330))	108
Arc::DataPointDirect (This is a kind of generalized file handle)	117
Arc::DataPointIndex (Complements DataPoint (p. 108) with attributes common for Indexing Service (p. 288) URLs)	122
Arc::DataPointLoader	128
Arc::DataPointPluginArgument	128
Arc::DataSourceType	128
Arc::DataSpeed (Keeps track of average and instantaneous transfer speed)	128
Arc::DataStagingType	131
Arc::DataStatus	132
Arc::DataTargetType	133

Arc::DataType	133
ArcSec::DateAttribute	134
ArcSec::DateTimeAttribute	135
Arc::DBranch	136
Arc::DelegationConsumer	136
Arc::DelegationConsumerSOAP	138
Arc::DelegationContainerSOAP	139
Arc::DelegationProvider	140
Arc::DelegationProviderSOAP	141
ArcSec::DenyOverridesCombiningAlg (Implement the "Deny-Overrides" algorithm)	143
Arc::DirectoryType	145
Arc::DiskSpaceRequirementType	145
Arc::DItem	145
Arc::DItemString	145
Arc::DNListHandlerConfig	146
ArcSec::DurationAttribute	146
ArcSec::EqualFunction (Evaluate whether the two values are equal)	147
ArcSec::EvalResult (Struct to record the xml node and effect, which will be used by Evaluator (p. 149) to get the information about which rule/policy(in xmlnode) is satisfied)	148
ArcSec::EvaluationCtx (EvaluationCtx (p. 148), in charge of storing some context information for)	148
ArcSec::Evaluator (Interface for policy evaluation. Execute the policy evaluation, based on the request and policy)	149
ArcSec::EvaluatorContext (Context for evaluator. It includes the factories which will be used to create related objects)	152
ArcSec::EvaluatorLoader (EvaluatorLoader (p. 152) is implemented as a helper class for loading different Evaluator (p. 149) objects, like ArcEvaluator)	152
Arc::ExecutableType	154
Arc::ExecutionTarget (ExecutionTarget (p. 154))	154
Arc::ExpirationReminder (A class intended for internal use within counters)	157
Arc::FileCache	158
FileCacheHash	163
Arc::FileInfo (FileInfo (p. 164) stores information about files (metadata))	164
Arc::FileLock (A general file locking class)	164
Arc::FileType	165
Arc::FinderLoader	165
ArcSec::FnFactory (Interface for function factory class)	165
ArcSec::Function (Interface for function, which is in charge of evaluating two AttributeValue (p. 56))	166
ArcSec::GenericAttribute	167
Arc::GlobusResult	168
Arc::GSSCredential	168
Arc::HakaClient	168
Arc::HTTPClientInfo	169
Arc::InfoCache (Stores XML document in filesystem split into parts)	169
Arc::InfoCacheInterface	170
Arc::InfoFilter (Filters information document according to identity of requestor)	170
Arc::InfoRegister (Registration to ISIS interface)	171
Arc::InfoRegisterContainer	172
Arc::InfoRegisters (Handling multiple registrations to ISISes)	173
Arc::InfoRegistrar (Registration process associated with particular ISIS)	173
Arc::InformationContainer (Information System document container and processor)	174
Arc::InformationInterface (Information System message processor)	175
Arc::InformationRequest (Request for information in InfoSystem)	176

Arc::InformationResponse (Informational response from InfoSystem)	178
Arc::IniConfig	178
Arc::initializeCredentialsType	179
ArcSec::InRangeFunction	179
Arc::IntraProcessCounter (A class for counters used by threads within a single process) . . .	179
Arc::ISIS_description	184
Arc::IString	184
Arc::JobDescriptionParserLoader::iterator	184
Arc::Job (Job (p. 184))	184
Arc::JobController (Base class for the JobControllers)	186
Arc::JobControllerLoader	189
Arc::JobControllerPluginArgument	190
Arc::JobDescription	191
Arc::JobDescriptionParser	192
Arc::JobDescriptionParserLoader	192
Arc::JobIdentificationType	193
Arc::JobMetaType	193
Arc::JobState	194
Arc::JobSupervisor (% JobSupervisor (p. 194) class)	194
Arc::LoadableModuleDescription	195
Arc::Loader (Plugins loader)	195
Arc::LogDestination (A base class for log destinations)	196
Arc::LogFile (A class for logging to files)	197
Arc::Logger (A logger class)	199
Arc::LoggerContext (Container for logger configuration)	203
Arc::LoggerFormat	203
Arc::LogMessage (A class for log messages)	203
Arc::LogStream (A class for logging to ostreams)	205
ArcSec::MatchFunction (Evaluate whether arg1 (value in regular expression) matched arg0 (label in regular expression))	206
Arc::MCC (Message (p. 216) Chain Component - base class for every MCC (p. 207) plugin) .	207
Arc::MCC_Status (A class for communication of MCC (p. 207) processing results)	210
Arc::MCCConfig	212
Arc::MCCInterface (Interface for communication between MCC (p. 207), Service (p. 288) and Plexer (p. 253) objects)	213
Arc::MCCLoader (Creator of Message (p. 216) Component Chains (MCC (p. 207))))	214
Arc::MCCPluginArgument	215
Arc::MD5Sum (Implementation of MD5 checksum)	215
Arc::MemoryAllocationException	216
Arc::Message (Object being passed through chain of MCCs)	216
Arc::MessageAttributes (A class for storage of attribute values)	218
Arc::MessageAuth (Contains authenticity information, authorization tokens and decisions) . . .	221
Arc::MessageAuthContext (Handler for content of message auth* context)	222
Arc::MessageContext (Handler for content of message context)	223
Arc::MessageContextElement (Top class for elements contained in message context)	223
Arc::MessagePayload (Base class for content of message passed through chain)	224
Arc::ModuleDesc (Description of loadable module)	224
Arc::ModuleManager (Manager of shared libraries)	224
Arc::MultiSecAttr (Container of multiple SecAttr (p. 283) attributes)	226
Arc::MySQLDatabase	227
Arc::MySQLQuery	229
Arc::NotificationType	231
Arc::NS	231
Arc::OAuthConsumer	231

Arc::OpenIdpClient	232
Arc::OptionParser	233
ArcSec::OrderedCombiningAlg	234
passwd	234
Arc::PathIterator (Class to iterate through elements of path)	234
Arc::PayloadRaw (Raw byte multi-buffer)	235
Arc::PayloadRawBuf	237
Arc::PayloadRawInterface (Random Access Payload for Message (p. 216) objects)	238
Arc::PayloadSOAP (Payload of Message (p. 216) with SOAP content)	240
Arc::PayloadStream (POSIX handle as Payload)	241
Arc::PayloadStreamInterface (Stream-like Payload for Message (p. 216) object)	244
Arc::PayloadWSRF (This class combines MessagePayload (p. 224) with WSRF (p. 376))	247
ArcSec::PDP (Base class for Policy (p. 260) Decision Point plugins)	248
ArcSec::PDPCfgContext	248
ArcSec::PDPPluginArgument	249
Arc::Period	249
ArcSec::PeriodAttribute	251
ArcSec::PermitOverridesCombiningAlg (Implement the "Permit-Overrides" algorithm)	252
Arc::Plexer (The Plexer (p. 253) class, used for routing messages to services)	253
Arc::PlexerEntry (A pair of label (regex) and pointer to MCC (p. 207))	255
Arc::Plugin (Base class for loadable ARC components)	255
Arc::PluginArgument (Base class for passing arguments to loadable ARC components)	256
Arc::PluginDesc (Description of plugin)	258
Arc::PluginDescriptor (Description of ARC lodable component)	258
Arc::PluginsFactory (Generic ARC plugins loader)	258
ArcSec::Policy (Interface for containing and processing different types of policy)	260
ArcSec::PolicyStore::PolicyElement	262
ArcSec::PolicyParser (A interface which will isolate the policy object from actual policy storage (files, urls, database))	262
ArcSec::PolicyStore (Storage place for policy objects)	263
Arc::Printf< T0, T1, T2, T3, T4, T5, T6, T7 >	264
Arc::PrintfBase	264
Arc::Profile	264
ArcCredential::PROXYCERTINFO_st	265
ArcCredential::PROXYPOLICY_st	265
Arc::Query	265
Arc::Range< T >	267
Arc::Register_Info_Type	268
Arc::RegisteredService (RegisteredService (p. 268) - extension of Service (p. 288) performing self-registration)	268
Arc::RegularExpression (A regular expression class)	268
ArcSec::Request (Base class/Interface for request, includes a container for RequestItems and some operations)	269
ArcSec::RequestAttribute (Wrapper which includes AttributeValue (p. 56) object which is generated according to date type of one spefic node in Request.xml)	271
ArcSec::RequestItem (Interface for request item container, <subjects, actions, objects, ctxs> tuple)	272
ArcSec::RequestTuple	272
Arc::ResourceSlotType	273
Arc::ResourcesType	273
Arc::ResourceTargetType	273
ArcSec::Response (Container for the evaluation results)	273
ArcSec::ResponseItem (Evaluation result concerning one RequestTuple (p. 272))	273
ArcSec::ResponseList	274

Arc::Run	274
Arc::SAML2LoginClient	277
Arc::SAML2SSOHTTPClient	278
Arc::SAMLToken (Class for manipulating SAML Token Profile (p. 264))	280
Arc::ScalableTime< T >	283
Arc::ScalableTime< int >	283
Arc::SecAttr (This is an abstract interface to a security attribute)	283
Arc::SecAttrFormat (Export/import format)	285
Arc::SecAttrValue (This is an abstract interface to a security attribute)	285
ArcSec::SecHandler (Base class for simple security handling plugins)	286
ArcSec::SecHandlerConfig	287
ArcSec::SecHandlerConfig	287
ArcSec::SecHandlerPluginArgument	287
ArcSec::Security (Common stuff used by security related slasses)	288
Arc::Service (Service (p. 288) - last component in a Message (p. 216) Chain)	288
Arc::ServicePluginArgument	290
Arc::SimpleCondition (Simple triggered condition)	290
Arc::SimpleCounter	292
Arc::SOAPMessage (Message (p. 216) restricted to SOAP payload)	292
Arc::Software (Used to represent software (names and version) and comparison)	293
Arc::SoftwareRequirement (Class used to express and resolve version requirements on software)	301
ArcSec::Source (Acquires and parses XML document from specified source)	308
ArcSec::SourceFile (Convenience class for obtaining XML document from file)	309
ArcSec::SourceURL (Convenience class for obtaining XML document from remote URL)	310
ArcSec::StringAttribute	310
Arc::Submitter (Base class for the Submitters)	311
Arc::SubmitterLoader	312
Arc::SubmitterPluginArgument	314
Arc::TargetGenerator (Target generation class)	314
Arc::TargetRetriever (TargetRetriever base class)	319
Arc::TargetRetrieverLoader	320
Arc::TargetRetrieverPluginArgument	322
Test::TestMCC	322
Test::TestService	323
Arc::ThreadDataItem (Base class for per-thread object)	323
Arc::ThreadInitializer	325
Arc::ThreadRegistry	325
Arc::Time (A class for storing and manipulating times)	326
ArcSec::TimeAttribute	329
Arc::TimedMutex	330
Arc::URL	330
Arc::URLLocation (Class to hold a resolved URL (p. 330) location)	338
Arc::URLMap	340
Arc::User	340
Arc::UserConfig (User configuration class)	340
Arc::UsernameToken (Interface for manipulation of WS-Security according to Username Token Profile (p. 264))	368
Arc::UserSwitch	370
Arc::VOMSTrustList	370
Arc::WSAEndpointReference (Interface for manipulation of WS-Adressing Endpoint Reference)	372
Arc::WSAHeader (Interface for manipulation WS-Adressing information in SOAP header)	373
Arc::WSRF (Base class for every WSRF (p. 376) message)	376

Arc::WSRFBaseFault (Base class for WSRF (p. 376) fault messages)	378
Arc::WSRFResourceUnavailableFault	379
Arc::WSRFResourceUnknownFault	380
Arc::WSRP (Base class for WS-ResourceProperties structures)	380
Arc::WSRPDeleteResourceProperties	382
Arc::WSRPDeleteResourcePropertiesRequest	382
Arc::WSRPDeleteResourcePropertiesRequestFailedFault	383
Arc::WSRPDeleteResourcePropertiesResponse	383
Arc::WSRPFault (Base class for WS-ResourceProperties faults)	383
Arc::WSRPGetMultipleResourcePropertiesRequest	384
Arc::WSRPGetMultipleResourcePropertiesResponse	385
Arc::WSRPGetResourcePropertyDocumentRequest	385
Arc::WSRPGetResourcePropertyDocumentResponse	385
Arc::WSRPGetResourcePropertyRequest	386
Arc::WSRPGetResourcePropertyResponse	386
Arc::WSRPInsertResourceProperties	387
Arc::WSRPInsertResourcePropertiesRequest	387
Arc::WSRPInsertResourcePropertiesRequestFailedFault	387
Arc::WSRPInsertResourcePropertiesResponse	388
Arc::WSRPInvalidModificationFault	388
Arc::WSRPInvalidResourcePropertyQNameFault	389
Arc::WSRPModifyResourceProperties	389
Arc::WSRPPutResourcePropertyDocumentRequest	390
Arc::WSRPPutResourcePropertyDocumentResponse	390
Arc::WSRPQueryResourcePropertiesRequest	390
Arc::WSRPQueryResourcePropertiesResponse	391
Arc::WSRPResourcePropertyChangeFailure	391
Arc::WSRPSetResourcePropertiesRequest	392
Arc::WSRPSetResourcePropertiesResponse	392
Arc::WSRPSetResourcePropertyRequestFailedFault	393
Arc::WSRPUnableToModifyResourcePropertyFault	393
Arc::WSRPUnableToPutResourcePropertyDocumentFault	394
Arc::WSRPUpdateResourceProperties	394
Arc::WSRPUpdateResourcePropertiesRequest	394
Arc::WSRPUpdateResourcePropertiesRequestFailedFault	395
Arc::WSRPUpdateResourcePropertiesResponse	395
ArcSec::X500NameAttribute	396
Arc::X509Token (Class for manipulating X.509 Token Profile (p. 264))	397
Arc::XmlContainer	398
Arc::XmlDatabase	399
Arc::XMLNode (Wrapper for LibXML library Tree interface)	399
Arc::XMLNodeContainer	410
Arc::XMLSecNode (Extends XMLNode (p. 399) class to support XML security operation)	412

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	??
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	??
CredentialStore.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	??
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	??
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	??
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	??
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)	415
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	??

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

Utility base class for MCC (p. 207).

- class **ClientTCP**

Class for setting up a MCC (p. 207) chain for TCP communication.

- struct **HTTPClientInfo**
- class **ClientHTTP**

Class for setting up a MCC (p. 207) chain for HTTP communication.

- class **ClientSOAP**
- class **SecHandlerConfig**
- class **DNListHandlerConfig**
- class **ARCPolicyHandlerConfig**
- class **ClientHTTPwithSAML2SSO**
- class **ClientSOAPwithSAML2SSO**
- class **ClientX509Delegation**
- class **ConfusaCertHandler**
- class **ConfusaParserUtils**
- class **HakaClient**
- class **OpenIdpClient**
- class **OAuthConsumer**
- class **SAML2LoginClient**
- class **SAML2SSOHTTPClient**
- class **ApplicationEnvironment**

ApplicationEnvironment (p. 50).

- class **ExecutionTarget**

ExecutionTarget (p. 154).

- class **Job**

Job (p. 184).

- class **JobController**

Base class for the JobControllers.

- class **JobControllerLoader**
- class **JobControllerPluginArgument**
- class **Range**
- class **ScalableTime**
- class **ScalableTime**< int >
- class **JobIdentificationType**
- class **ExecutableType**
- class **NotificationType**
- 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 **JobDescriptionParserLoader**
- class **JobState**
- class **JobSupervisor**

% JobSupervisor (p. 194) class

- class **Software**

Used to represent software (names and version) and comparison.

- class **SoftwareRequirement**

Class used to express and resolve version requirements on software.

- class **Submitter**

Base class for the Submitters.

- class **SubmitterLoader**
- class **SubmitterPluginArgument**
- class **TargetGenerator**

Target generation class

- class **TargetRetriever**

TargetRetriever base class

- class **TargetRetrieverLoader**
- class **TargetRetrieverPluginArgument**
- class **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**

A general file locking class.

- class **IniConfig**
- class **IntraProcessCounter**

A class for counters used by threads within a single process.

- class **PrintfBase**
- class **Printf**
- class **IString**

- struct **LoggerFormat**
- class **LogMessage**
A class for log messages.
- class **LogDestination**
A base class for log destinations.
- class **LogStream**
A class for logging to ostreams.
- class **LogFile**
A class for logging to files.
- class **LoggerContext**
Container for logger configuration.
- class **Logger**
A logger class.
- class **MySQLDatabase**
- class **MySQLQuery**
- class **OptionParser**
- class **Profile**
- class **Run**
- class **ThreadDataItem**
Base class for per-thread object.
- class **SimpleCondition**
Simple triggered condition.
- class **SimpleCounter**
- class **TimedMutex**
- class **ThreadRegistry**
- class **ThreadInitializer**
- class **URL**
- class **URLLocation**
*Class to hold a resolved **URL** (p. 330) location.*
- class **PathIterator**
Class to iterate through elements of path.
- class **User**
- class **UserSwitch**
- class **initializeCredentialsType**
- class **UserConfig**
User configuration class
- class **CertEnvLocker**
- 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 **CredentialStore**

- 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**

*Wrapper for **Checksum** (p. 66) class.*

- class **DataBuffer**

Represents set of buffers.

- class **DataCallback**

- class **DataHandle**

*This class is a wrapper around the **DataPoint** (p. 108) class.*

- class **DataMover**

- class **DataPoint**

*This base class is an abstraction of **URL** (p. 330).*

- class **DataPointLoader**

- class **DataPointPluginArgument**

- class **DataPointDirect**

This is a kind of generalized file handle.

- class **DataPointIndex**

*Complements **DataPoint** (p. 108) with attributes common for Indexing **Service** (p. 288) URLs.*

- class **DataSpeed**

Keeps track of average and instantaneous transfer speed.

- class **DataStatus**
- struct **CacheParameters**
- class **FileCache**
- class **FileInfo**

FileInfo (p. 164) 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**

RegisteredService (p. 268) - extension of *Service* (p. 288) performing self-registration.

- 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 **PluginDesc**
Description of plugin.
- class **ModuleDesc**
Description of loadable module.
- class **PluginsFactory**
Generic ARC plugins loader.
- class **MCCInterface**
*Interface for communication between **MCC** (p. 207), **Service** (p. 288) and **Plexer** (p. 253) objects.*
- class **MCC**
***Message** (p. 216) Chain Component - base class for every **MCC** (p. 207) plugin.*
- class **MCCConfig**
- class **MCCPluginArgument**
- class **MCC_Status**
*A class for communication of **MCC** (p. 207) processing results.*
- class **MCCLoader**
*Creator of **Message** (p. 216) Component Chains (**MCC** (p. 207)).*
- class **ChainContext**
Interface to chain specific functionality.
- class **MessagePayload**
Base class for content of message passed through chain.
- class **MessageContextElement**
Top class for elements contained in message context.
- class **MessageContext**

Handler for content of message context.

- class **MessageAuthContext**

Handler for content of message auth context.*

- class **Message**

Object being passed through chain of MCCs.

- class **AttributeIterator**

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

- class **MessageAttributes**

A class for storage of attribute values.

- class **MessageAuth**

Contains authenticity information, authorization tokens and decisions.

- class **PayloadRawInterface**

*Random Access Payload for **Message** (p. 216) objects.*

- struct **PayloadRawBuf**

- class **PayloadRaw**

Raw byte multi-buffer.

- class **PayloadSOAP**

*Payload of **Message** (p. 216) with SOAP content.*

- class **PayloadStreamInterface**

*Stream-like Payload for **Message** (p. 216) object.*

- class **PayloadStream**

POSIX handle as Payload.

- class **PlexerEntry**

*A pair of label (regex) and pointer to **MCC** (p. 207).*

- class **Plexer**

*The **Plexer** (p. 253) class, used for routing messages to services.*

- class **CIStrStringValue**

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. 283) attributes.*
- class **Service**
***Service** (p. 288) - last component in a **Message** (p. 216) Chain.*
- class **ServicePluginArgument**
- class **SOAPMessage**
***Message** (p. 216) 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 **SAMLTToken**
*Class for manipulating SAML Token **Profile** (p. 264).*
- class **UsernameToken**
*Interface for manipulation of WS-Security according to Username Token **Profile** (p. 264).*
- class **X509Token**
*Class for manipulating X.509 Token **Profile** (p. 264).*
- class **PayloadWSRF**
*This class combines **MessagePayload** (p. 224) with **WSRF** (p. 376).*
- 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. 376) message.

- class **WSRFBaseFault**

Base class for WSRF (p. 376) fault messages.

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

Extends XMLNode (p. 399) 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())`
- `int FileOpen (const std::string &path, int flags, mode_t mode=0600)`
- `int FileOpen (const std::string &path, int flags, uid_t uid, gid_t gid, mode_t mode=0600)`
- `bool FileCopy (const std::string &source_path, const std::string &destination_path)`
- `bool FileCopy (const std::string &source_path, int destination_handle)`
- `bool FileCopy (int source_handle, const std::string &destination_path)`
- `bool FileCopy (int source_handle, int destination_handle)`
- `Glib::Dir * DirOpen (const std::string &path)`
- `Glib::Dir * DirOpen (const std::string &path, uid_t uid, gid_t gid)`
- `bool FileStat (const std::string &path, struct stat *st, bool follow_symlinks)`
- `bool FileStat (const std::string &path, struct stat *st, uid_t uid, gid_t gid, bool follow_symlinks)`
- `bool DirCreate (const std::string &path, mode_t mode, bool with_parents=false)`
- `bool DirCreate (const std::string &path, uid_t uid, gid_t gid, mode_t mode, bool with_parents=false)`
- `bool DirDelete (const std::string &path)`
- `bool DirDelete (const std::string &path, uid_t uid, gid_t gid)`
- `void GUID (std::string &guid)`
- `std::string UUID (void)`
- `std::ostream & operator<< (std::ostream &os, LogLevel level)`
- `LogLevel string_to_level (const std::string &str)`
- `bool istring_to_level (const std::string &llStr, LogLevel &ll)`
- `bool string_to_level (const std::string &str, LogLevel &ll)`
- `std::string level_to_string (const LogLevel &level)`
- `LogLevel old_level_to_level (unsigned int old_level)`
- `template<typename T >
T stringto (const std::string &s)`
- `template<typename T >
bool stringto (const std::string &s, T &t)`
- `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=" ", const std::string &start_quotes="", const std::string &end_quotes="")`
- `std::string trim (const std::string &str, const char *sep=NULL)`
- `std::string strip (const std::string &str)`
- `std::string uri_unescape (const std::string &str)`
- `std::string convert_to_rdn (const std::string &dn)`
- `bool CreateThreadFunction (void(*func)(void *), void *arg, SimpleCounter *count=NULL)`
- `std::list< URL > ReadURLList (const URL &urllist)`
- `std::string GetEnv (const std::string &var)`
- `std::string GetEnv (const std::string &var, bool &found)`
- `bool SetEnv (const std::string &var, const std::string &value, bool overwrite=true)`
- `void UnsetEnv (const std::string &var)`
- `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 &vname, 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** (const **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)
- const std::string **get_property** (const **Arc::Credential** &u, const std::string property)
- 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 rwflag, void *)
- bool **init_xmlsec** (void)
- bool **final_xmlsec** (void)
- std::string **get_cert_str** (const char *certfile)
- xmlSecKey * **get_key_from_keystr** (const std::string &value)
- xmlSecKey * **get_key_from_keyfile** (const char *keyfile)
- std::string **get_key_from_certfile** (const char *certfile)
- xmlSecKey * **get_key_from_certstr** (const std::string &value)
- xmlSecKeysMngrPtr **load_key_from_keyfile** (xmlSecKeysMngrPtr *keys_manager, const char *keyfile)
- xmlSecKeysMngrPtr **load_key_from_certfile** (xmlSecKeysMngrPtr *keys_manager, const char *certfile)
- xmlSecKeysMngrPtr **load_key_from_certstr** (xmlSecKeysMngrPtr *keys_manager, const std::string &certstr)
- xmlSecKeysMngrPtr **load_trusted_cert_file** (xmlSecKeysMngrPtr *keys_manager, const char *cert_file)
- xmlSecKeysMngrPtr **load_trusted_cert_str** (xmlSecKeysMngrPtr *keys_manager, const std::string &cert_str)
- xmlSecKeysMngrPtr **load_trusted_certs** (xmlSecKeysMngrPtr *keys_manager, const char *cafile, const char *capath)
- **XMLNode** **get_node** (**XMLNode** &parent, const char *name)

Variables

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

5.1.1 Detailed Description

Some utility methods for using xml security library (<http://www.aleksey.com/xmlsec/>). **JobDescription** (p.191) The **JobDescription** (p.191) 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/arcl/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.192) The **JobDescriptionParser** (p.192) 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.

Credential (p.89) class covers the functionality about general processing about certificate/key files, including: 1. cercticate/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.89) 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.218) 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.218) 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 lodable component.

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

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. VERBOSE level designates fine-grained informational events that will give additional information about the application. DEBUG level designates finer-grained informational events which should only be used for debugging purposes.

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. 216) does not fit into expected protocol.
- BUSY_ERROR** There is no destination configured for this message.
- SESSION_CLOSE** **Message** (p. 216) 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. 216) payload.

If no buffer is present or if payload is not of **PayloadRawInterface** (p. 238) type NULL is returned.

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

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

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

5.1.4.4 `bool Arc::createVOMSAC (std::string & codedac, Credential & issuer_cred, Credential & holder_cred, std::vector< std::string > & fqn, 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 `int Arc::FileOpen (const std::string & path, int flags, mode_t mode = 0600)`

Utility functions for handling files and directories.

Open a file and return a file handle

5.1.4.6 bool Arc::final_xmlsec (void)

Finalize the xml security library

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

Get certificate in string format from certificate file

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

Get public key in string format from certificate file

5.1.4.9 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-----")

5.1.4.10 xmlSecKey* Arc::get_key_from_keyfile (const char * *keyfile*)

Get key in xmlSecKey structure from key file

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

Get key in xmlSecKey structure from key in string format

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

Generate a new child **XMLNode** (p. 399) with specified name

5.1.4.13 const std::string Arc::get_property (const Arc::Credential & *u*, const std::string *property*)

Extract the needed field from the certificate

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

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

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

5.1.4.15 bool Arc::init_xmlsec (void)

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

5.1.4.16 bool Arc::istring_to_level (const std::string & *lStr*, LogLevel & *ll*)

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

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

Parameters

lStr a string which should be parsed to a **Arc::LogLevel** (p. 36).

ll a **Arc::LogLevel** (p. 36) reference which will be set to the matching **Arc::LogLevel** (p. 36) upon successful parsing.

Returns

true in case of successful parsing, otherwise false.

See also

LogLevel (p. 36)

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

Load public key from a certificate file into key manager

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

Load public key from a certificate string into key manager

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

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

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

Load trusted certificate from certificate file into key manager

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

Load trusted certificate from certificate string into key manager

5.1.4.22 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

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

Returns true if underlying XML elements have same names

5.1.4.24 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

5.1.4.25 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

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

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

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

Returns true if underlying XML elements belong to same namespaces

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

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

5.1.4.29 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. 50) it is advisable to call it after **ArcLocation::Init()** (p. 51).

5.1.4.30 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.

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

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

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

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

5.1.4.33 `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.

5.1.4.34 `bool Arc::parseVOMSAC (const 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

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

callback method for inputing passphrase of key file

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

Conversion to string.

Conversion from StatusKind to string.

Parameters

kind The StatusKind to convert.

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

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

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

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

5.1.4.39 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

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

Makes WS-Addressing fault.

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

5.1.4.41 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. 199) 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. 258) 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:

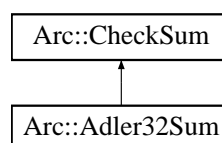
- VOMSAttribute.h

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:

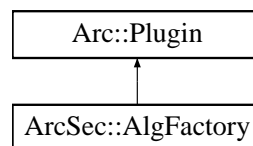
- CheckSum.h

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. 48) is in charge of creating **CombiningAlg** (p. 75) 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

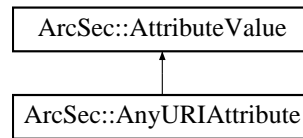
The object of **CombiningAlg** (p. 75)

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 bool **equal** (AttributeValue *other, bool check_id=true)
- 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. 57).

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

Evaluate whether "this" equals to the parameter value

Implements **ArcSec::AttributeValue** (p. 57).

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

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

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

Get the DataType of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

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

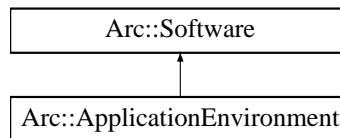
- AnyURIAttribute.h

6.21 Arc::ApplicationEnvironment Class Reference

ApplicationEnvironment (p. 50).

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

Inheritance diagram for Arc::ApplicationEnvironment:



6.21.1 Detailed Description

ApplicationEnvironment (p. 50). The ApplicationEnvironment is closely related to the definition given in GLUE2. By extending the **Software** (p. 293) 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::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** ()

6.23.1 Detailed Description

Determines ARC installation location.

6.23.2 Member Function Documentation

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

Returns ARC plugins directory location.

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

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

Initializes location information.

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

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

- ArcLocation.h

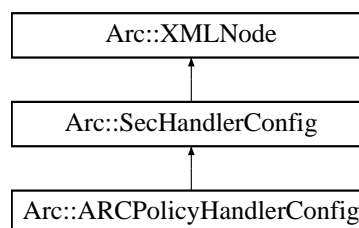
6.24 ArcSec::ArcPeriod Struct Reference

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

- DateTimeAttribute.h

6.25 Arc::ARCPolicyHandlerConfig Class Reference

Inheritance diagram for Arc::ARCPolicyHandlerConfig:



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

- ClientInterface.h

6.26 ArcSec::Attr Struct Reference

Attr (p. 51) contains a tuple of attribute type and value.

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

6.26.1 Detailed Description

Attr (p. 51) contains a tuple of attribute type and value.

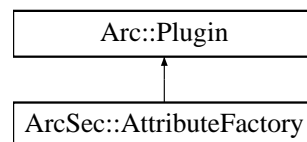
The documentation for this struct was generated from the following file:

- Request.h

6.27 ArcSec::AttributeFactory Class Reference

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

Inheritance diagram for ArcSec::AttributeFactory:



6.27.1 Detailed Description

Base attribute factory class

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

- AttributeFactory.h

6.28 Arc::AttributeIterator Class Reference

A const 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`

6.28.1 Detailed Description

A const iterator class for accessing multiple values of an attribute. This is an iterator class that is used when accessing multiple values of an attribute. The `getAll()` method of the `MessageAttributes` (p. 218) class returns an `AttributeIterator` (p. 52) 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;
```

6.28.2 Constructor & Destructor Documentation

6.28.2.1 Arc::AttributeIterator::AttributeIterator ()

Default constructor.

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

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

Protected constructor used by the `MessageAttributes` (p. 218) 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. 218) class.

Parameters

- begin* A `const_iterator` pointing to the first matching key-value pair in the internal multimap of the `MessageAttributes` (p. 218) class.
- end* A `const_iterator` pointing to the first key-value pair in the internal multimap of the `MessageAttributes` (p. 218) class where the key is larger than the key searched for.

6.28.3 Member Function Documentation

6.28.3.1 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.

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

The key of attribute.

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

6.28.3.3 `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.

6.28.3.4 `const AttributeIterator& Arc::AttributeIterator::operator++ ()`

The prefix advance operator.

Advances the iterator to the next value. Works intuitively.

Returns

A const reference to this iterator.

6.28.3.5 `AttributeIterator Arc::AttributeIterator::operator++ (int)`

The postfix advance operator.

Advances the iterator to the next value. Works intuitively.

Returns

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

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

The arrow operator.

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

6.28.4 Friends And Related Function Documentation**6.28.4.1 `friend class MessageAttributes [friend]`**

The `MessageAttributes` (p. 218) class is a friend.

The constructor that creates an **AttributeIterator** (p. 52) that is connected to the internal multimap of the **MessageAttributes** (p. 218) class should not be exposed to the outside, but it still needs to be accessible from the `getAll()` method of the **MessageAttributes** (p. 218) class. Therefore, that class is a friend.

6.28.5 Field Documentation

6.28.5.1 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. 218) class.

6.28.5.2 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. 218) class where the key is larger than the key searched for.

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

- MessageAttributes.h

6.29 ArcSec::AttributeProxy Class Reference

Interface for creating the **AttributeValue** (p. 56) object, it will be used by **AttributeFactory** (p. 52).

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

Public Member Functions

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

6.29.1 Detailed Description

Interface for creating the **AttributeValue** (p. 56) object, it will be used by **AttributeFactory** (p. 52). The **AttributeProxy** (p. 55) 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. 56)

6.29.2 Member Function Documentation

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

Create a **AttributeValue** (p. 56) object according to the information inside the **XMLNode** as parameter.

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

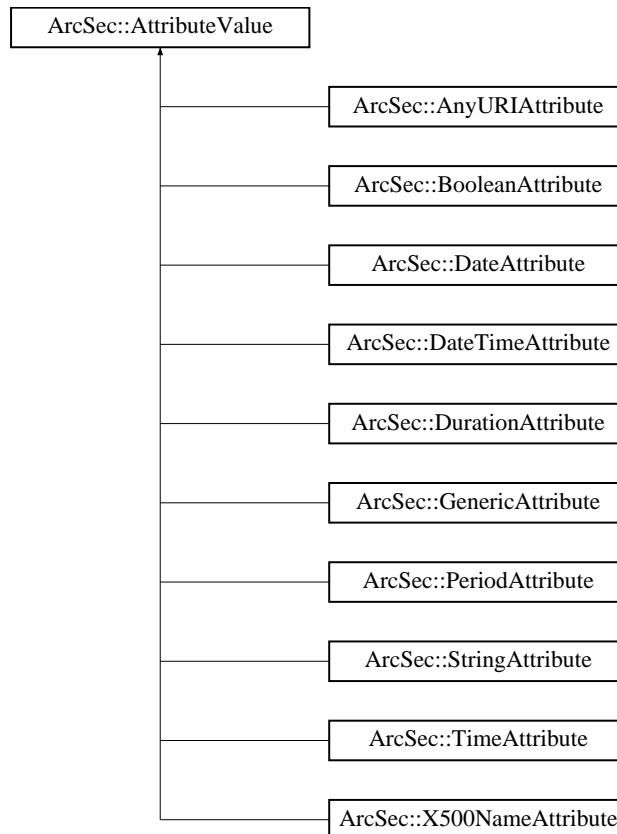
- AttributeProxy.h

6.30 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

6.30.1 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. 310), **DateAttribute** (p. 134), **TimeAttribute** (p. 329), **DurationAttribute** (p. 146), **PeriodAttribute** (p. 251), **AnyURIAttribute** (p. 49), **X500NameAttribute** (p. 396)

6.30.2 Member Function Documentation

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

encode the value in a string format

Implemented in [ArcSec::AnyURIAttribute](#) (p. 49), [ArcSec::BooleanAttribute](#) (p. 61), [ArcSec::DateTimeAttribute](#) (p. 135), [ArcSec::TimeAttribute](#) (p. 329), [ArcSec::DateAttribute](#) (p. 134), [ArcSec::DurationAttribute](#) (p. 146), [ArcSec::PeriodAttribute](#) (p. 251), [ArcSec::GenericAttribute](#) (p. 167), [ArcSec::StringAttribute](#) (p. 311), and [ArcSec::X500NameAttribute](#) (p. 396).

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

Evaluate whether "this" equals to the parameter value

Implemented in [ArcSec::AnyURIAttribute](#) (p. 49), [ArcSec::BooleanAttribute](#) (p. 61), [ArcSec::DateTimeAttribute](#) (p. 135), [ArcSec::TimeAttribute](#) (p. 329), [ArcSec::DateAttribute](#) (p. 134), [ArcSec::DurationAttribute](#) (p. 147), [ArcSec::PeriodAttribute](#) (p. 251), [ArcSec::GenericAttribute](#) (p. 167), [ArcSec::StringAttribute](#) (p. 311), and [ArcSec::X500NameAttribute](#) (p. 396).

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

Get the AttributeId of the <Attribute>

Implemented in [ArcSec::AnyURIAttribute](#) (p. 49), [ArcSec::BooleanAttribute](#) (p. 61), [ArcSec::DateTimeAttribute](#) (p. 135), [ArcSec::TimeAttribute](#) (p. 330), [ArcSec::DateAttribute](#) (p. 134), [ArcSec::DurationAttribute](#) (p. 147), [ArcSec::PeriodAttribute](#) (p. 252), [ArcSec::GenericAttribute](#) (p. 168), [ArcSec::StringAttribute](#) (p. 311), and [ArcSec::X500NameAttribute](#) (p. 396).

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

Get the DataType of the <Attribute>

Implemented in [ArcSec::AnyURIAttribute](#) (p. 49), [ArcSec::BooleanAttribute](#) (p. 61), [ArcSec::DateTimeAttribute](#) (p. 135), [ArcSec::TimeAttribute](#) (p. 330), [ArcSec::DateAttribute](#) (p. 134), [ArcSec::DurationAttribute](#) (p. 147), [ArcSec::PeriodAttribute](#) (p. 252), [ArcSec::GenericAttribute](#) (p. 168), [ArcSec::StringAttribute](#) (p. 311), and [ArcSec::X500NameAttribute](#) (p. 396).

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

- AttributeValue.h

6.31 ArcSec::Attrs Class Reference

Attrs (p. 57) is a container for one or more **Attr** (p. 51).

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

6.31.1 Detailed Description

Attr (p.57) is a container for one or more **Attr** (p.51). **Attr** (p.57) 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

6.32 ArcSec::AuthzRequest Struct Reference

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

- PDP.h

6.33 ArcSec::AuthzRequestSection Struct Reference

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

6.33.1 Detailed Description

These structure are based on the request schema for **PDP** (p.248), 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

6.34 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

6.34.1 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 maintaining 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`

6.35 Arc::Base64 Class Reference

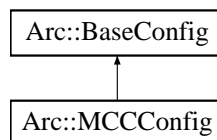
The documentation for this class was generated from the following file:

- `Base64.h`

6.36 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

6.36.1 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.

6.36.2 Member Function Documentation

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

Add CA directory

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

Add CA file

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

Add certificate

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

Add configuration overlay

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

Adds non-standard location of plugins

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

Add private key

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

Add credentials proxy

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

Read overlay from file

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

Adds configuration part corresponding to stored information into common configuration tree supplied in 'cfg' argument. Returns reference to XML node representing configuration of **ModuleManager** (p. 224)

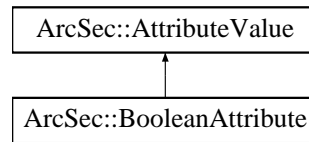
Reimplemented in **Arc::MCCCConfig** (p. 213).

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

- ArcConfig.h

6.37 ArcSec::BooleanAttribute Class Reference

Inheritance diagram for ArcSec::BooleanAttribute:



Public Member Functions

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

6.37.1 Member Function Documentation

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

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 57).

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

Evaluate whether "this" equale to the parameter value

Implements **ArcSec::AttributeValue** (p. 57).

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

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

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

Get the DataType of the <Attribute>

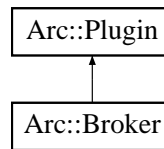
Implements **ArcSec::AttributeValue** (p. 57).

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

- BooleanAttribute.h

6.38 Arc::Broker Class Reference

Inheritance diagram for Arc::Broker:



Public Member Functions

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

Protected Member Functions

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

Protected Attributes

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

6.38.1 Member Function Documentation

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

Returns next target from the list of **ExecutionTarget** (p. 154) objects.

When first called this method will sort its list of **ExecutionTarget** (p. 154) 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. 154) in the list is returned.

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

ExecutionTarget (p. 154) filtering, view-point: enough memory, disk space, CPUs, etc.

The "bad" targets will be ignored and only the good targets will be added to the list of **ExecutionTarget** (p. 154) objects which be used for brokering.

Parameters

- targets* A list of **ExecutionTarget** (p. 154) objects to be considered for addition to the **Broker** (p. 62).
- jd* **JobDescription** (p. 191) object of the actual job.

6.38.1.3 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. 154) which has the shortest queue length will be at the beginning of the PossibleTargets list

6.38.2 Field Documentation**6.38.2.1 std::list<const ExecutionTarget*> Arc::Broker::PossibleTargets [protected]**

This content the Prefilteres ExecutionTargets.

If an Execution Target has enough memory, CPU, disk space, etc. for the actual job requirement than it will be added to the PossibleTargets list

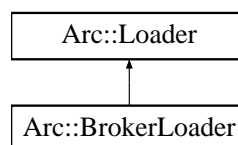
The documentation for this class was generated from the following file:

- Broker.h

6.39 Arc::BrokerLoader Class Reference

```
#include <Broker.h>
```

Inheritance diagram for Arc::BrokerLoader:

**Public Member Functions**

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

6.39.1 Detailed Description

Class responsible for loading **Broker** (p. 62) plugins The **Broker** (p. 62) objects returned by a **BrokerLoader** (p. 63) must not be used after the **BrokerLoader** (p. 63) goes out of scope.

6.39.2 Constructor & Destructor Documentation

6.39.2.1 Arc::BrokerLoader::BrokerLoader ()

Constructor Creates a new **BrokerLoader** (p. 63).

6.39.2.2 Arc::BrokerLoader::~~BrokerLoader ()

Destructor Calling the destructor destroys all Brokers loaded by the **BrokerLoader** (p. 63) instance.

6.39.3 Member Function Documentation

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

Retrieve the list of loaded Brokers.

Returns

A reference to the list of Brokers.

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

Load a new **Broker** (p. 62)

Parameters

name The name of the **Broker** (p. 62) to load.

usercfg The **UserConfig** (p. 340) object for the new **Broker** (p. 62).

Returns

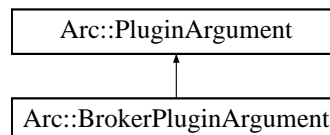
A pointer to the new **Broker** (p. 62) (NULL on error).

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

- Broker.h

6.40 Arc::BrokerPluginArgument Class Reference

Inheritance diagram for Arc::BrokerPluginArgument:



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

- Broker.h

6.41 Arc::ByteArray Class Reference

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

- ByteArray.h

6.42 Arc::CacheParameters Struct Reference

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

6.42.1 Detailed Description

Contains data on the parameters of a cache.

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

- FileCache.h

6.43 ArcCredential::cert_verify_context Struct Reference

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

- CertUtil.h

6.44 Arc::CertEnvLocker Class Reference

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

- UserConfig.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. 214) object. It is accessible for **MCC** (p. 207) and **Service** (p. 288) components and provides an interface to manipulate chains stored in **Loader** (p. 195). 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. 258) object

References Arc::Loader::factory_.

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

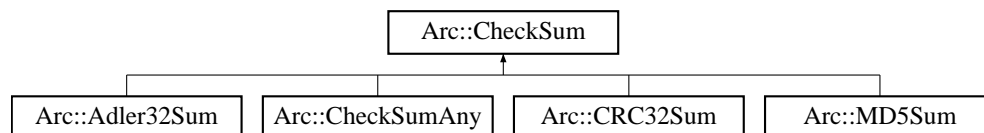
- MCCLoader.h

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. 100) class

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

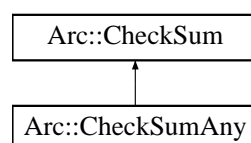
- CheckSum.h

6.47 Arc::ChecksumAny Class Reference

Wrapper for **Checksum** (p. 66) class.

```
#include <Checksum.h>
```

Inheritance diagram for Arc::ChecksumAny:



6.47.1 Detailed Description

Wrapper for **Checksum** (p. 66) 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:

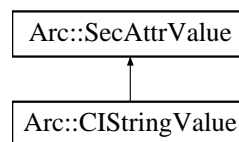
- CheckSum.h

6.48 Arc::CIStrStringValue Class Reference

This class implements case insensitive strings as security attributes.

```
#include <CIStrStringValue.h>
```

Inheritance diagram for Arc::CIStrStringValue:



Public Member Functions

- **CIStrStringValue** ()
- **CIStrStringValue** (const char *ss)
- **CIStrStringValue** (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. 285). The class is meant to implement security attributes that are case insensitive strings.

6.48.2 Constructor & Destructor Documentation

6.48.2.1 Arc::CIStrStringValue::CIStrStringValue ()

Default constructor

6.48.2.2 Arc::CIStrStringValue::CIStrStringValue (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

Reimplemented from **Arc::SecAttrValue** (p. 285).

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

This function returns false if the string is empty or uninitialized

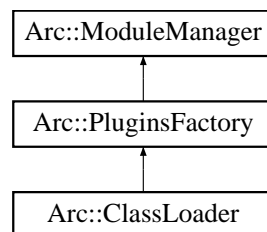
Reimplemented from **Arc::SecAttrValue** (p. 286).

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

- CStringValue.h

6.49 Arc::ClassLoader Class Reference

Inheritance diagram for Arc::ClassLoader:

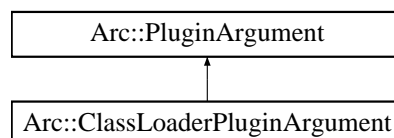


The documentation for this class was generated from the following file:

- ClassLoader.h

6.50 Arc::ClassLoaderPluginArgument Class Reference

Inheritance diagram for Arc::ClassLoaderPluginArgument:



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

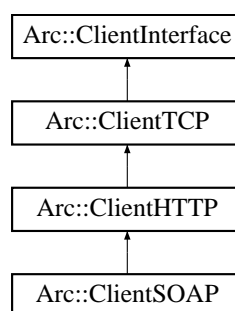
- ClassLoader.h

6.51 Arc::ClientHTTP Class Reference

Class for setting up a **MCC** (p. 207) chain for HTTP communication.

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

Inheritance diagram for Arc::ClientHTTP:



6.51.1 Detailed Description

Class for setting up a **MCC** (p. 207) chain for HTTP communication. The **ClientHTTP** (p. 69) class inherits from the **ClientTCP** (p. 73) class and adds an HTTP **MCC** (p. 207) to the chain.

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. 207) 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:

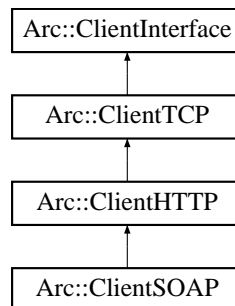
- ClientSAML2SSO.h

6.53 Arc::ClientInterface Class Reference

Utility base class for **MCC** (p. 207).

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

Inheritance diagram for Arc::ClientInterface:



6.53.1 Detailed Description

Utility base class for **MCC** (p. 207). The **ClientInterface** (p. 70) class is a utility base class used for configuring a client side **Message** (p. 216) Chain Component (**MCC** (p. 207)) chain and loading it into memory. It has several specializations of increasing complexity of the **MCC** (p. 207) chains.

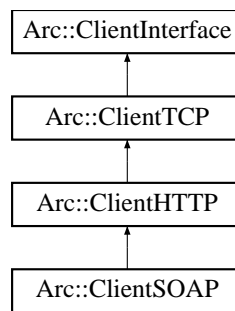
The documentation for this class was generated from the following file:

- 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 bool 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. 207) chain and making an entry point.

6.54.2 Constructor & Destructor Documentation

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

Constructor creates MCC (p. 207) 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. 207)

Reimplemented from **Arc::ClientHTTP** (p. 69).

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

Returns entry point to SOAP MCC (p. 207) in configured chain. To initialize entry point **Load()** (p. 72) method must be called.

Reimplemented from **Arc::ClientHTTP** (p. 69).

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

Instantiates pluggable elements according to generated configuration

Reimplemented from **Arc::ClientHTTP** (p. 69).

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

Send SOAP request and receive response.

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

Send SOAP request with specified SOAP action and receive response.

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

- ClientInterface.h

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. 207) chain and connects to server.

6.55.2 Member Function Documentation

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

Send SOAP request and receive response.

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

Send SOAP request with specified SOAP action and receive response.

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

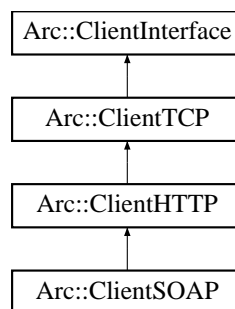
- ClientSAML2SSO.h

6.56 Arc::ClientTCP Class Reference

Class for setting up a **MCC** (p. 207) chain for TCP communication.

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

Inheritance diagram for Arc::ClientTCP:



6.56.1 Detailed Description

Class for setting up a **MCC** (p. 207) chain for TCP communication. The **ClientTCP** (p. 73) class is a specialization of the **ClientInterface** (p. 70) which sets up a client **MCC** (p. 207) chain for TCP communication, and optionally with a security layer on top which can be either TLS, GSI or SSL3.

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

- ClientInterface.h

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. 207) 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 aquires this delegation credential from the delegation service and also acts on behalf of the EEC's holder by using this delegation credential).

Parameters

deleg Delegation type

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

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

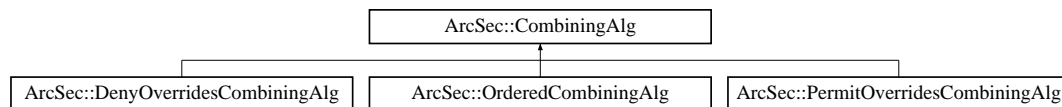
- ClientX509Delegation.h

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 combining 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. 144), and **ArcSec::PermitOverridesCombiningAlg** (p. 252).

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. 144), and **ArcSec::PermitOverridesCombiningAlg** (p. 253).

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

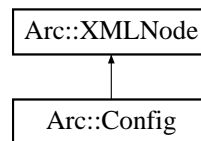
- CombiningAlg.h

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. 399) 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. 89) 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. 77) for DN dn and given keysize Basically Confusa cert handler wraps around **Credential** (p. 89)

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::MCCCConfig 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:

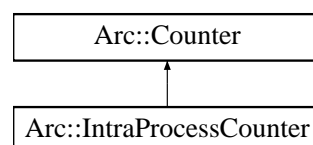
- Utils.h

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 already 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. 87) 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. 80) is an abstract class, it should only be used by subclasses. Therefore it is protected. Furthermore, since the **Counter** (p. 80) 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. 80) class. Since the **Counter** (p. 80) 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. 87) that corresponds to the reservation.

Parameters

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

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. 181).

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. 181).

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. 87) 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.

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. 87) class.

This method acts as a relay for one of the constructors of the **CounterTicket** (p. 87) class. That constructor is private, but needs to be accessible from the subclasses of **Counter** (p. 80) (but not from anywhere else). In order not to have to declare every possible subclass of **Counter** (p. 80) as a friend of **CounterTicket** (p. 87), only the base class **Counter** (p. 80) 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. 87).

expiryTime the expiry time of the reservation corresponding to the **CounterTicket** (p. 87).

counter The **Counter** (p. 80) 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. 182).

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

A "relay method" for the constructor of **ExpirationReminder** (p. 157).

This method acts as a relay for one of the constructors of the **ExpirationReminder** (p. 157) class. That constructor is private, but needs to be accessible from the subclasses of **Counter** (p. 80) (but not from anywhere else). In order not to have to declare every possible subclass of **Counter** (p. 80) as a friend of **ExpirationReminder** (p. 157), only the base class **Counter** (p. 80) 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. 157).

resID The identity number of the reservation corresponding to the **ExpirationReminder** (p. 157).

Returns

The **ExpirationReminder** (p. 157) 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. 182).

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 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. 182).

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

Implemented in **Arc::IntraProcessCounter** (p. 183).

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. 183).

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. 183).

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. 80), 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. 87) 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. 80).

6.64.3 Member Function Documentation

6.64.3.1 void Arc::CounterTicket::cancel ()

Cancels 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. 87).

This method checks whether a **CounterTicket** (p. 87) is valid. The ticket was probably returned earlier by the `reserve()` method of a **Counter** (p. 80) but the corresponding reservation may have expired.

Returns

The validity of the ticket.

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

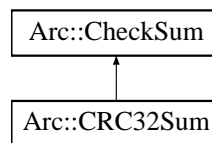
- Counter.h

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 &cacfile, const std::string &passphrase4key="", const bool is_file=true)
- **Credential** (const **UserConfig** &usercfg, const std::string &passphrase4key="")
- void **AddCertExtObj** (std::string &sn, std::string &oid)
- void **LogError** (void) const
- bool **GetVerification** (void) const
- EVP_PKEY * **GetPrivKey** (void) const
- EVP_PKEY * **GetPubKey** (void) const
- X509 * **GetCert** (void) const
- X509_REQ * **GetCertReq** (void) const
- **STACK_OF** (X509) * **GetCertChain** (void) const
- int **GetCertNumofChain** (void) const
- Credformat **getFormat** (BIO *in, const bool is_file=true) const
- std::string **GetDN** (void) const
- std::string **GetIdentityName** (void) const
- **ArcCredential::certType** **GetType** (void) const
- std::string **GetProxyPolicy** (void) const
- 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) const
- **Time GetStartTime** () const
- **Time GetEndTime** () const
- void **SetLifeTime** (const **Period** &period)
- void **SetStartTime** (const **Time** &start_time)
- bool **IsValid** (void)
- 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)
- static bool **IsCredentialsValid** (const **UserConfig** &usercfg)

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>=0.9.8, 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

passphrase4key, specifies the password for decrypting private key (if needed). If value is empty then password will be asked interactively. To avoid asking for password use value provided by NoPassword() method.

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

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

Constructor, specific constructor for usual certificate, constructing from information in UserConfig (p. 340) object. Only acts as a container for parsing the certificate and key files, is meaningless for any other use. this constructor will parse the credential * information, and put them into "this" object

Parameters

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

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*, 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

6.66.2.3 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 **VOMSAtribute.h** (p. ??) and VOMSAtribute.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)

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

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

6.66.2.5 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

6.66.2.6 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 (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

6.66.2.8 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 (const char * *filename*, bool *if_der* = *false*)

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

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

Get the certificate attached to this object

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

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

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

Get the certificate request, if there is any

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

Get the DN of the certificate attached to this object

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

Returns validity end time of certificate or proxy

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

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

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

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

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

Returns lifetime of certificate or proxy

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

Get the private key attached to this object

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

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) const`

Get the public key attached to this object

6.66.2.21 `Time Arc::Credential::GetStartTime () const`

Returns validity start time of certificate or proxy

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

Get type of the certificate attached to this object

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

Get the verification result about certificate chain checking

6.66.2.24 `static void Arc::Credential::InitProxyCertInfo (void) [static]`

Initiate nid for proxy certificate extension

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

Inquire the certificate request from a file

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

Inquire the certificate request from a string

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

Returns true if credentials are valid. Credentials are read from locations specified in **UserConfig** (p. 340) object. This method is deprecated. **User** (p. 340) per-instance method **IsValid()** (p. 95) instead.

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

Returns true if credentials are valid

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

Log error information related with openssl

6.66.2.31 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

6.66.2.32 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

6.66.2.33 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

6.66.2.34 bool Arc::Credential::OutputPublicKey (std::string & *content*)

Output the public key into string

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

Set lifetime of certificate or proxy

6.66.2.36 `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

6.66.2.37 `void Arc::Credential::SetStartTime (const Time & start_time)`

Set start time of certificate or proxy

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

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

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

Sign request and output the signed certificate to a file

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

Sign request and output the signed certificate to a string

6.66.2.41 `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

6.66.2.42 `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

6.66.2.43 `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

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

Get the certificate chain attached to this object

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

- Credential.h

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. 89) 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. 97) class.

Parameters

what An explanation of the error.

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

- Credential.h

6.68 Arc::CredentialStore Class Reference

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

6.68.1 Detailed Description

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

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

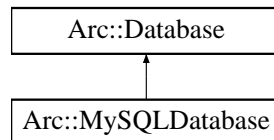
- CredentialStore.h

6.69 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

6.69.1 Detailed Description

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

6.69.2 Constructor & Destructor Documentation

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

Default constructor

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

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

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

Copy constructor

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

Deconstructor

6.69.3 Member Function Documentation

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

Close the connection with database server

Implemented in **Arc::MySQLDatabase** (p. 228).

6.69.3.2 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. 228).

6.69.3.3 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. 228).

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

Get the connection status

Implemented in **Arc::MySQLDatabase** (p. 228).

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

Ask database server to shutdown

Implemented in **Arc::MySQLDatabase** (p. 228).

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

- DBInterface.h

6.70 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

6.70.1 Detailed Description

Represents set of buffers. This class is used during data transfer using **DataPoint** (p. 108) classes.

6.70.2 Constructor & Destructor Documentation

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

Constructor

Parameters

size size of every buffer in bytes.

blocks number of buffers.

6.70.2.2 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. 100) itself.

6.70.3 Member Function Documentation

6.70.3.1 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. 100) itself.

Returns

integer position in the list of checksum objects.

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

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

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

Returns **CheckSum** (p. 66) object specified in constructor, returns NULL if index is not in list.

Parameters

index of the checksum in question.

6.70.3.4 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.

6.70.3.5 bool Arc::DataBuffer::eof_read ()

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

6.70.3.6 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.

6.70.3.7 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.

6.70.3.8 bool Arc::DataBuffer::eof_write ()

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

6.70.3.9 bool Arc::DataBuffer::error ()

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

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

Informs object if error occurred on 'read' side.

Parameters

v true if error.

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

Informs object if error accured on 'write' side.

Parameters

v true if error.

6.70.3.12 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

6.70.3.13 bool Arc::DataBuffer::for_read ()

Check if there are buffers which can be taken by **for_read()** (p. 103). This function checks only for buffers and does not take eof and error conditions into account.

6.70.3.14 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.

6.70.3.15 bool Arc::DataBuffer::for_write ()

Check if there are buffers which can be taken by **for_write()** (p. 103). This function checks only for buffers and does not take eof and error conditions into account.

6.70.3.16 bool Arc::DataBuffer::is_notwritten (int *handle*)

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

Parameters

handle buffer's number.

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

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

Parameters

buf - address of buffer

6.70.3.18 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.

6.70.3.19 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.

6.70.3.20 bool Arc::DataBuffer::is_written (int *handle*)

Informs object that data was written from buffer.

Parameters

handle buffer's number.

6.70.3.21 bool Arc::DataBuffer::is_written (char * *buf*)

Informs object that data was written from buffer.

Parameters

buf - address of buffer

6.70.3.22 `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. 100) itself.

6.70.3.23 `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

6.71 Arc::DataCallback Class Reference

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

6.71.1 Detailed Description

This class is used by **DataHandle** (p. 105) 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

6.72 Arc::DataHandle Class Reference

This class is a wrapper around the **DataPoint** (p. 108) class.

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

6.72.1 Detailed Description

This class is a wrapper around the **DataPoint** (p. 108) class. It simplifies the construction, use and destruction of **DataPoint** (p. 108) objects.

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

- DataHandle.h

6.73 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)

6.73.1 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. 107). Instance represents only attributes used during transfer.

6.73.2 Member Function Documentation

6.73.2.1 bool Arc::DataMover::checks ()

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

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

Set if to make 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).

6.73.2.3 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.

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

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

6.73.2.5 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. 128) class.

6.73.2.6 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. 128) class.

6.73.2.7 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. 128) class.

6.73.2.8 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. 330).

destination destination **URL** (p. 330).

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. 330) mapping/conversion table (for 'source' **URL** (p. 330)).

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.

6.73.2.9 `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.

6.73.2.10 `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. 107) is NULL.

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

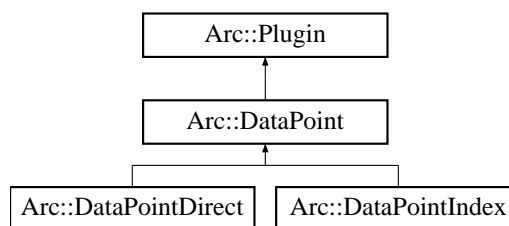
- DataMover.h

6.74 Arc::DataPoint Class Reference

This base class is an abstraction of **URL** (p. 330).

```
#include <DataPoint.h>
```

Inheritance diagram for Arc::DataPoint:



Public Types

- enum **DataPointAccessLatency** { ACCESS_LATENCY_ZERO, ACCESS_LATENCY_SMALL, ACCESS_LATENCY_LARGE }
- enum **DataPointInfoType** { ,
INFO_TYPE_NAME = 1, INFO_TYPE_TYPE = 2, INFO_TYPE_TIMES = 4, INFO_TYPE_CONTENT = 8,
INFO_TYPE_ACCESS = 16, INFO_TYPE_STRUCT = 32, INFO_TYPE_REST = 64, INFO_TYPE_ALL = 127 }

Public Member Functions

- **DataPoint** (const **URL** &url, const **UserConfig** &usercfg)
- virtual ~**DataPoint** ()
- virtual const **URL** & **GetURL** () const
- virtual const **UserConfig** & **GetUserConfig** () 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** **Stat** (**FileInfo** &file, **DataPointInfoType** verb=INFO_TYPE_ALL)=0
- virtual **DataStatus** **List** (std::list< **FileInfo** > &files, **DataPointInfoType** verb=INFO_TYPE_ALL)=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 const std::string **DefaultChecksum** () 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 void **SetAccessLatency** (const **DataPointAccessLatency** &latency)
- virtual **DataPointAccessLatency** **GetAccessLatency** () 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 void **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 **DataStatus** **CompareLocationMetadata** () const =0
- virtual bool **NextLocation** ()=0
- virtual bool **LocationValid** () const =0
- virtual bool **LastLocation** ()=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
- virtual int **AddChecksumObject** (**Checksum** *cksum)=0
- virtual void **SortLocations** (const std::string &pattern, const **URLMap** &url_map)=0

Protected Attributes

- std::list< std::string > **valid_url_options**

6.74.1 Detailed Description

This base class is an abstraction of **URL** (p. 330). 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. 108) provides means to resolve an indexing service **URL** (p. 330) into multiple URLs and to loop through them.

6.74.2 Member Enumeration Documentation

6.74.2.1 enum Arc::DataPoint::DataPointAccessLatency

Describes the latency to access this **URL** (p. 330).

For now this value is one of a small set specified by the enumeration. In the future with more sophisticated protocols or information it could be replaced by a more fine-grained list of possibilities such as an int value.

Enumerator:

ACCESS_LATENCY_ZERO **URL** (p. 330) can be accessed instantly.

ACCESS_LATENCY_SMALL **URL** (p. 330) has low (but non-zero) access latency, for example staged from disk.

ACCESS_LATENCY_LARGE **URL** (p. 330) has a large access latency, for example staged from tape.

6.74.2.2 enum Arc::DataPoint::DataPointInfoType

Describes type of information about **URL** (p. 330) to request.

Enumerator:

INFO_TYPE_NAME Whatever protocol can get with no additional effort.
INFO_TYPE_TYPE Only name of object (relative).
INFO_TYPE_TIMES Type of object - currently file or dir.
INFO_TYPE_CONTENT Timestamps associated with object.
INFO_TYPE_ACCESS Metadata describing content, like size, checksum, etc.
INFO_TYPE_STRUCT Access control - ownership, permission, etc.
INFO_TYPE_REST Fine structure - replicas, transfer locations, redirections.
INFO_TYPE_ALL All the other parameters.

6.74.3 Constructor & Destructor Documentation

6.74.3.1 Arc::DataPoint::DataPoint (const URL & *url*, const UserConfig & *usercfg*)

Constructor requires **URL** (p. 330) to be provided.

References to *url* and *usercfg* arguments are stored internally and hence corresponding objects must stay available during whole lifetime of this instance.

6.74.4 Member Function Documentation

6.74.4.1 virtual int Arc::DataPoint::AddChecksumObject (CheckSum * *cksum*) [pure virtual]

Add a checksum object which will compute checksum during transmission.

Parameters

cksum object which will compute checksum. Should not be destroyed till DataPointer itself.

Returns

integer position in the list of checksum objects.

Implemented in **Arc::DataPointDirect** (p. 118), and **Arc::DataPointIndex** (p. 124).

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

Add **URL** (p. 330) to list.

Parameters

url Location **URL** (p. 330) to add.

meta Location meta information.

Implemented in **Arc::DataPointDirect** (p. 119), and **Arc::DataPointIndex** (p. 124).

6.74.4.3 **virtual DataStatus Arc::DataPoint::Check () [pure virtual]**

Query (p. 265) the **DataPoint** (p. 108) to check if object is accessible.

If possible this method will also try to provide meta information about the object. It returns positive response if object's content can be retrieved.

Implemented in **Arc::DataPointIndex** (p. 124).

6.74.4.4 **virtual DataStatus Arc::DataPoint::CompareLocationMetadata () const [pure virtual]**

Compare metadata of **DataPoint** (p. 108) and current location.

Returns inconsistency error or error encountered during operation, or success

Implemented in **Arc::DataPointDirect** (p. 119), and **Arc::DataPointIndex** (p. 124).

6.74.4.5 **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.

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

Returns meta information used to create current **URL** (p. 330).

Usage differs between different indexing services.

Implemented in **Arc::DataPointDirect** (p. 119), and **Arc::DataPointIndex** (p. 125).

6.74.4.7 **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.

6.74.4.8 **virtual DataStatus Arc::DataPoint::List (std::list< FileInfo > & files, DataPointInfoType verb = INFO_TYPE_ALL) [pure virtual]**

List hierarchical content of this object.

If the **DataPoint** (p. 108) represents a directory or something similar its contents will be listed.

Parameters

files will contain list of file names and requested attributes. There may be more attributes than requested. There may be less if object can't provide particular information.

verb defines attribute types which method must try to retrieve. It is not a failure if some attributes could not be retrieved due to limitation of protocol or access control.

6.74.4.9 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. 119), and **Arc::DataPointIndex** (p. 125).

6.74.4.10 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. 119), and **Arc::DataPointIndex** (p. 125).

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

Index **Service** (p. 288) 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. 288) under same name.

Implemented in **Arc::DataPointDirect** (p. 120).

6.74.4.12 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. 288).

Implemented in **Arc::DataPointDirect** (p. 120).

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

Index **Service** (p. 288) 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. 288) under same name.

Implemented in **Arc::DataPointDirect** (p. 120).

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

If endpoint can provide at least some meta information directly.

Implemented in **Arc::DataPointDirect** (p. 120), and **Arc::DataPointIndex** (p. 125).

6.74.4.15 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. 120), and **Arc::DataPointIndex** (p. 125).

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

List file(s).

If the **DataPoint** (p. 108) represents a directory its contents will be listed.

Parameters

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

long_list if true, list additional properties of each file.

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

metadata if true, find all available metadata. Allow/disallow **DataPoint** (p. 108) to produce scattered data during reading* operation.

v true if allowed (default is false).

Implemented in **Arc::DataPointDirect** (p. 121), and **Arc::DataPointIndex** (p. 125).

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

Check if file is registered in Indexing **Service** (p. 288).

Proper value is obtainable only after Resolve.

Implemented in **Arc::DataPointDirect** (p. 121), and **Arc::DataPointIndex** (p. 126).

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

Resolves index service **URL** (p. 330) into list of ordinary URLs.

Also obtains meta information about the file.

Parameters

source true if **DataPoint** (p. 108) object represents source of information.

Implemented in **Arc::DataPointDirect** (p. 121).

6.74.4.19 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. 121), and **Arc::DataPointIndex** (p. 126).

6.74.4.20 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.

Reimplemented in **Arc::DataPointIndex** (p. 126).

6.74.4.21 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. 122), and **Arc::DataPointIndex** (p. 126).

6.74.4.22 virtual void Arc::DataPoint::SortLocations (const std::string & *pattern*, const URLMap & *url_map*) [pure virtual]

Sort locations according to the specified pattern.

Parameters

pattern a set of strings, separated by |, to match against.

Implemented in **Arc::DataPointDirect** (p. 122), and **Arc::DataPointIndex** (p. 126).

6.74.4.23 virtual `DataStream Arc::DataPoint::StartReading (DataBuffer & buffer) [pure virtual]`

Start reading data from **URL** (p. 330).

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. 127).

6.74.4.24 virtual `DataStream Arc::DataPoint::StartWriting (DataBuffer & buffer, DataCallback * space_cb = NULL) [pure virtual]`

Start writing data to **URL** (p. 330).

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. 127).

6.74.4.25 virtual `DataStream Arc::DataPoint::Stat (FileInfo & file, DataPointInfoType verb = INFO_TYPE_ALL) [pure virtual]`

Retrieve information about this object.

If the **DataPoint** (p. 108) represents a directory or something similar its contents will be listed.

Parameters

file will contain object name and requested attributes. There may be more attributes than requested. There may be less if object can't provide particular information.

verb defines attribute types which method must try to retrieve. It is not a failure if some attributes could not be retrieved due to limitation of protocol or access control.

6.74.4.26 virtual `DataStream 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. 127).

6.74.4.27 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. 127).

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

Index **Service** (p. 288) unregistration.

Remove information about file registered in Indexing **Service** (p. 288).

Parameters

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

Implemented in **Arc::DataPointDirect** (p. 122).

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

Returns true if **URL** (p. 330) can accept scattered data for *writing* operation.

Implemented in **Arc::DataPointDirect** (p. 122), and **Arc::DataPointIndex** (p. 127).

6.74.5 Field Documentation**6.74.5.1 std::list<std::string> Arc::DataPoint::valid_url_options [protected]**

Subclasses should add their own specific options to this list

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

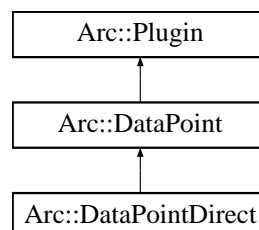
- DataPoint.h

6.75 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 int **AddChecksumObject** (**Checksum** *cksum)
- 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 **DataStatus** **CompareLocationMetadata** () const
- virtual bool **NextLocation** ()
- virtual bool **LocationValid** () const
- virtual bool **HaveLocations** () const
- virtual bool **LastLocation** ()
- virtual **DataStatus** **AddLocation** (const **URL** &url, const std::string &meta)
- virtual **DataStatus** **RemoveLocation** ()
- virtual **DataStatus** **RemoveLocations** (const **DataPoint** &p)
- virtual void **SortLocations** (const std::string &, const **URLMap** &)

6.75.1 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. 100) 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.

6.75.2 Member Function Documentation

6.75.2.1 virtual int Arc::DataPointDirect::AddChecksumObject (**Checksum** * *cksum*) [virtual]

Add a checksum object which will compute checksum during transmission.

Parameters

checksum object which will compute checksum. Should not be destroyed till DataPointer itself.

Returns

integer position in the list of checksum objects.

Implements **Arc::DataPoint** (p. 111).

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

Add **URL** (p. 330) to list.

Parameters

url Location **URL** (p. 330) to add.

meta Location meta information.

Implements **Arc::DataPoint** (p. 111).

6.75.2.3 **virtual DataStatus Arc::DataPointDirect::CompareLocationMetadata () const [virtual]**

Compare metadata of **DataPoint** (p. 108) and current location.

Returns inconsistency error or error encountered during operation, or success

Implements **Arc::DataPoint** (p. 112).

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

Returns meta information used to create current **URL** (p. 330).

Usage differs between different indexing services.

Implements **Arc::DataPoint** (p. 112).

6.75.2.5 **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. 113).

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

Request passive transfers for FTP-like protocols.

Parameters

true to request.

Implements **Arc::DataPoint** (p. 113).

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

Index **Service** (p. 288) 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. 288) under same name.

Implements **Arc::DataPoint** (p. 113).

6.75.2.8 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. 288).

Implements **Arc::DataPoint** (p. 113).

6.75.2.9 virtual DataStatus Arc::DataPointDirect::PreUnregister (bool *replication*) [virtual]

Index **Service** (p. 288) 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. 288) under same name.

Implements **Arc::DataPoint** (p. 113).

6.75.2.10 virtual bool Arc::DataPointDirect::ProvidesMeta () [virtual]

If endpoint can provide at least some meta information directly.

Implements **Arc::DataPoint** (p. 114).

6.75.2.11 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. 114).

6.75.2.12 virtual void Arc::DataPointDirect::ReadOutOfOrder (bool *v*) [virtual]

List file(s).

If the **DataPoint** (p. 108) represents a directory its contents will be listed.

Parameters

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

long_list if true, list additional properties of each file.

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

metadata if true, find all available metadata. Allow/disallow **DataPoint** (p. 108) to produce scattered data during reading* operation.

v true if allowed (default is false).

Implements **Arc::DataPoint** (p. 114).

6.75.2.13 virtual bool Arc::DataPointDirect::Registered () const [virtual]

Check if file is registered in Indexing **Service** (p. 288).

Proper value is obtainable only after Resolve.

Implements **Arc::DataPoint** (p. 114).

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

Resolves index service **URL** (p. 330) into list of ordinary URLs.

Also obtains meta information about the file.

Parameters

source true if **DataPoint** (p. 108) object represents source of information.

Implements **Arc::DataPoint** (p. 114).

6.75.2.15 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. 115).

6.75.2.16 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. 115).

6.75.2.17 virtual void Arc::DataPointDirect::SortLocations (const std::string & *pattern*, const URLMap & *url_map*) [inline, virtual]

Sort locations according to the specified pattern.

Parameters

pattern a set of strings, separated by |, to match against.

Implements **Arc::DataPoint** (p. 115).

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

Index **Service** (p. 288) unregistration.

Remove information about file registered in Indexing **Service** (p. 288).

Parameters

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

Implements **Arc::DataPoint** (p. 117).

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

Returns true if **URL** (p. 330) can accept scattered data for *writing* operation.

Implements **Arc::DataPoint** (p. 117).

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

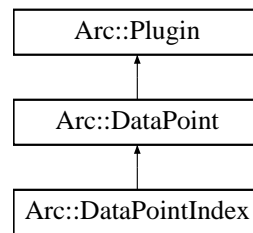
- DataPointDirect.h

6.76 Arc::DataPointIndex Class Reference

Complements **DataPoint** (p. 108) with attributes common for Indexing **Service** (p. 288) URLs.

```
#include <DataPointIndex.h>
```

Inheritance diagram for Arc::DataPointIndex:



Public Member Functions

- virtual const **URL & CurrentLocation** () const
- virtual const std::string & **CurrentLocationMetadata** () const
- virtual **DataStatus CompareLocationMetadata** () const
- virtual bool **NextLocation** ()
- virtual bool **LocationValid** () const
- virtual bool **HaveLocations** () const
- virtual bool **LastLocation** ()
- virtual **DataStatus RemoveLocation** ()
- virtual **DataStatus RemoveLocations** (const **DataPoint** &p)
- virtual **DataStatus AddLocation** (const **URL** &url, const std::string &meta)
- virtual void **SortLocations** (const std::string &pattern, const **URLMap** &url_map)
- virtual bool **IsIndex** () const
- virtual bool **AcceptsMeta** ()
- virtual bool **ProvidesMeta** ()
- virtual void **SetMeta** (const **DataPoint** &p)
- virtual void **SetChecksum** (const std::string &val)
- virtual void **SetSize** (const unsigned long long int val)
- 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 **DataPointAccessLatency GetAccessLatency** () const
- virtual void **Passive** (bool v)
- virtual void **Range** (unsigned long long int start=0, unsigned long long int end=0)
- virtual int **AddChecksumObject** (**Checksum** *cksum)

6.76.1 Detailed Description

Complements **DataPoint** (p. 108) with attributes common for Indexing **Service** (p. 288) URLs. It should never be used directly. Instead inherit from it to provide a class for specific a Indexing **Service** (p. 288).

6.76.2 Member Function Documentation

6.76.2.1 `virtual int Arc::DataPointIndex::AddChecksumObject (CheckSum * cksum) [virtual]`

Add a checksum object which will compute checksum during transmission.

Parameters

cksum object which will compute checksum. Should not be destroyed till DataPointer itself.

Returns

integer position in the list of checksum objects.

Implements **Arc::DataPoint** (p. 111).

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

Add **URL** (p. 330) to list.

Parameters

url Location **URL** (p. 330) to add.

meta Location meta information.

Implements **Arc::DataPoint** (p. 111).

6.76.2.3 `virtual DataStatus Arc::DataPointIndex::Check () [virtual]`

Query (p. 265) the **DataPoint** (p. 108) to check if object is accessible.

If possible this method will also try to provide meta information about the object. It returns positive response if object's content can be retrieved.

Implements **Arc::DataPoint** (p. 112).

6.76.2.4 `virtual DataStatus Arc::DataPointIndex::CompareLocationMetadata () const [virtual]`

Compare metadata of **DataPoint** (p. 108) and current location.

Returns inconsistency error or error encountered during operation, or success

Implements **Arc::DataPoint** (p. 112).

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

Returns meta information used to create current **URL** (p. 330).

Usage differs between different indexing services.

Implements **Arc::DataPoint** (p. 112).

6.76.2.6 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. 113).

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

Request passive transfers for FTP-like protocols.

Parameters

true to request.

Implements **Arc::DataPoint** (p. 113).

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

If endpoint can provide at least some meta information directly.

Implements **Arc::DataPoint** (p. 114).

6.76.2.9 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. 114).

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

List file(s).

If the **DataPoint** (p. 108) represents a directory its contents will be listed.

Parameters

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

long_list if true, list additional properties of each file.

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

metadata if true, find all available metadata. Allow/disallow **DataPoint** (p. 108) to produce scattered data during reading* operation.

v true if allowed (default is false).

Implements **Arc::DataPoint** (p. 114).

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

Check if file is registered in Indexing **Service** (p. 288).

Proper value is obtainable only after Resolve.

Implements **Arc::DataPoint** (p. 114).

6.76.2.12 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. 115).

6.76.2.13 virtual void Arc::DataPointIndex::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.

Reimplemented from **Arc::DataPoint** (p. 115).

6.76.2.14 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. 115).

6.76.2.15 virtual void Arc::DataPointIndex::SortLocations (const std::string & *pattern*, const URLMap & *url_map*) [virtual]

Sort locations according to the specified pattern.

Parameters

pattern a set of strings, separated by |, to match against.

Implements **Arc::DataPoint** (p. 115).

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

Start reading data from **URL** (p. 330).

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. 116).

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

Start writing data to **URL** (p. 330).

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. 116).

6.76.2.18 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. 116).

6.76.2.19 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. 117).

6.76.2.20 virtual bool Arc::DataPointIndex::WriteOutOfOrder () [virtual]

Returns true if **URL** (p. 330) can accept scattered data for *writing* operation.

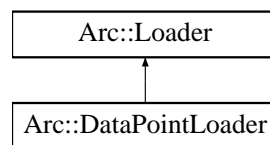
Implements **Arc::DataPoint** (p. 117).

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

- DataPointIndex.h

6.77 Arc::DataPointLoader Class Reference

Inheritance diagram for Arc::DataPointLoader:

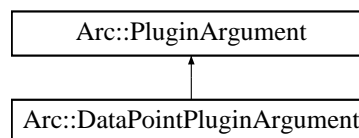


The documentation for this class was generated from the following file:

- DataPoint.h

6.78 Arc::DataPointPluginArgument Class Reference

Inheritance diagram for Arc::DataPointPluginArgument:



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

- DataPoint.h

6.79 Arc::DataSourceType Class Reference

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

- JobDescription.h

6.80 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)
- time_t **get_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)

6.80.1 Detailed Description

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

6.80.2 Constructor & Destructor Documentation

6.80.2.1 Arc::DataSpeed::DataSpeed (time_t base = DATASPEED_AVERAGING_PERIOD)

Constructor

Parameters

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

6.80.2.2 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.

6.80.3 Member Function Documentation

6.80.3.1 void Arc::DataSpeed::hold (bool *disable*)

Turn off speed control.

Parameters

disable true to turn off.

6.80.3.2 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).

6.80.3.3 void Arc::DataSpeed::set_max_data (unsigned long long int *max* = 0)

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

Parameters

max amount of data in bytes.

6.80.3.4 void Arc::DataSpeed::set_max_inactivity_time (time_t *max_inactivity_time*)

Set inactivity timeout.

Parameters

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

6.80.3.5 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.

6.80.3.6 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 (Butes per second). If speed drops and holds below threshold for min_speed_time_ seconds error is triggered.

min_speed_time

6.80.3.7 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.

6.80.3.8 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).

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

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

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

Print information about current speed and amout of data.

Parameters

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

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

- DataSpeed.h

6.81 Arc::DataStagingType Class Reference

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

- JobDescription.h

6.82 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, **StatError** = 27, **NotInitializedError** = 29,
SystemError = 30, **StageError** = 31, **InconsistentMetadataError** = 32, **SuccessCached** = 33,
UnknownError = 34 }

6.82.1 Detailed Description

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

6.82.2 Member Enumeration Documentation

6.82.2.1 enum Arc::DataStatus::DataStatusType

Enumerator:

- Success** Operation completed successfully.
- ReadAcquireError** Source is bad **URL** (p. 330) or can't be used due to some reason.
- WriteAcquireError** Destination is bad **URL** (p. 330) or can't be used due to some reason.
- ReadResolveError** Resolving of index service **URL** (p. 330) for source failed.
- WriteResolveError** Resolving of index service **URL** (p. 330) 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. 330) failed.
- PostRegisterError** Last stage of registration of index service **URL** (p. 330) failed.

UnregisterError Unregistration of index service **URL** (p. 330) failed.

CacheError Error in caching procedure.

CredentialsExpiredError Error due to provided credentials are expired.

DeleteError Error deleting location or **URL** (p. 330).

NoLocationError No valid location available.

LocationAlreadyExistsError No valid location available.

NotSupportedForDirectDataPointsError Operation has no sense for this kind of **URL** (p. 330).

UnimplementedError Feature is unimplemented.

IsReadingError **DataPoint** (p. 108) is already reading.

IsWritingError **DataPoint** (p. 108) is already writing.

CheckError Access check failed.

ListError File listing failed.

StatError File/dir stating failed.

NotInitializedError Object initialization failed.

SystemError Error in OS.

StageError Staging error.

InconsistentMetadataError Inconsistent metadata.

SuccessCached Data was already cached.

UnknownError Undefined.

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

- DataStatus.h

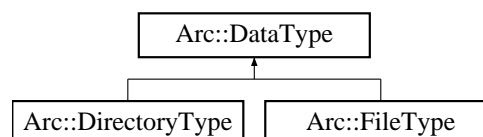
6.83 Arc::DataTargetType Class Reference

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

- JobDescription.h

6.84 Arc::DataType Class Reference

Inheritance diagram for Arc::DataType:

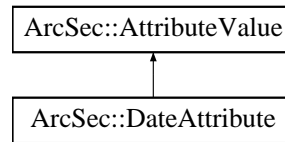


The documentation for this class was generated from the following file:

- JobDescription.h

6.85 ArcSec::DateAttribute Class Reference

Inheritance diagram for ArcSec::DateAttribute:



Public Member Functions

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

6.85.1 Member Function Documentation

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

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 57).

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

Evaluate whether "this" equals to the parameter value

Implements **ArcSec::AttributeValue** (p. 57).

6.85.1.3 virtual std::string ArcSec::DateAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

6.85.1.4 virtual std::string ArcSec::DateAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

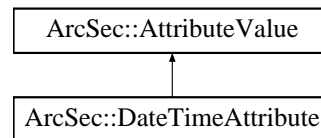
The documentation for this class was generated from the following file:

- DateTimeAttribute.h

6.86 ArcSec::DateTimeAttribute Class Reference

```
#include <DateTimeAttribute.h>
```

Inheritance diagram for ArcSec::DateTimeAttribute:



Public Member Functions

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

6.86.1 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

6.86.2 Member Function Documentation

6.86.2.1 virtual std::string ArcSec::DateTimeAttribute::encode () [virtual]

encode the value in a string format

Implements ArcSec::AttributeValue (p. 57).

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

Evaluate whether "this" equals to the parameter value

Implements ArcSec::AttributeValue (p. 57).

6.86.2.3 virtual std::string ArcSec::DateTimeAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements ArcSec::AttributeValue (p. 57).

6.86.2.4 virtual std::string ArcSec::DateTimeAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

Implements ArcSec::AttributeValue (p. 57).

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

- DateTimeAttribute.h

6.87 Arc::DBranch Class Reference

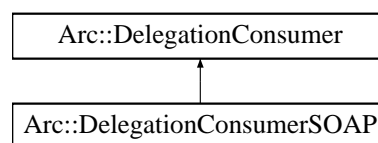
The documentation for this class was generated from the following file:

- DBranch.h

6.88 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)

6.88.1 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. 137) method for generating certificate request followed by call to **Acquire()** (p. 137) method for making complete credentials from certificate chain.

6.88.2 Constructor & Destructor Documentation

6.88.2.1 Arc::DelegationConsumer::DelegationConsumer (void)

Creates object with new private key

6.88.2.2 Arc::DelegationConsumer::DelegationConsumer (const std::string & *content*)

Creates object with provided private key

6.88.3 Member Function Documentation

6.88.3.1 bool Arc::DelegationConsumer::Acquire (std::string & *content*)

Ads private key into certificates chain in 'content' On exit content contains complete delegated credentials.

6.88.3.2 bool Arc::DelegationConsumer::Acquire (std::string & *content*, std::string & *identity*)

Includes the functionality in Acquire(content); pluse extracting the credential identity

6.88.3.3 bool Arc::DelegationConsumer::Backup (std::string & *content*)

Stores content of this object into a string

6.88.3.4 bool Arc::DelegationConsumer::Generate (void) [protected]

Private key

6.88.3.5 const std::string& Arc::DelegationConsumer::ID (void)

Return identifier of this object - not implemented

6.88.3.6 void Arc::DelegationConsumer::LogError (void) [protected]

Creates private key

6.88.3.7 bool Arc::DelegationConsumer::Request (std::string & *content*)

Make X509 certificate request from internal private key

6.88.3.8 bool Arc::DelegationConsumer::Restore (const std::string & *content*)

Restores content of object from string

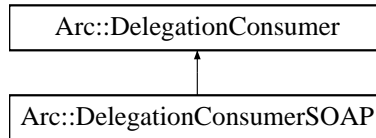
The documentation for this class was generated from the following file:

- DelegationInterface.h

6.89 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, **XMLNode** token)

6.89.1 Detailed Description

This class extends **DelegationConsumer** (p. 136) to support SOAP message exchange. Implements WS interface <http://www.nordugrid.org/schemas/delegation> described in delegation.wsdl.

6.89.2 Constructor & Destructor Documentation

6.89.2.1 Arc::DelegationConsumerSOAP::DelegationConsumerSOAP (void)

Creates object with new private key

6.89.2.2 Arc::DelegationConsumerSOAP::DelegationConsumerSOAP (const std::string &content)

Creates object with specified private key

6.89.3 Member Function Documentation

6.89.3.1 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.

6.89.3.2 `bool Arc::DelegationConsumerSOAP::DelegatedToken (std::string & credentials, XMLNode token)`

Similar to UpdateCredentials but takes only DelegatedToken XML element

6.89.3.3 `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

6.89.3.4 `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

6.90 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, XMLNode token)`

Protected Attributes

- `int max_size_`
- `int max_duration_`
- `int max_usage_`
- `bool context_lock_`
- `bool restricted_`

6.90.1 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. 138) with identifier included in SOAP message used to route execution to one of managed **DelegationConsumerSOAP** (p. 138) instances.

6.90.2 Member Function Documentation

6.90.2.1 `bool Arc::DelegationContainerSOAP::DelegateCredentialsInit (const SOAPEnvelope & in, SOAPEnvelope & out)`

See `DelegationConsumerSOAP::DelegateCredentialsInit` (p. 138)

6.90.2.2 `bool Arc::DelegationContainerSOAP::DelegatedToken (std::string & credentials, XMLNode token)`

See `DelegationConsumerSOAP::DelegatedToken` (p. 139)

6.90.2.3 `bool Arc::DelegationContainerSOAP::UpdateCredentials (std::string & credentials, const SOAPEnvelope & in, SOAPEnvelope & out)`

See `DelegationConsumerSOAP::UpdateCredentials` (p. 139)

6.90.3 Field Documentation

6.90.3.1 `bool Arc::DelegationContainerSOAP::context_lock_ [protected]`

If true delegation consumer is deleted when connection context is destroyed

6.90.3.2 `int Arc::DelegationContainerSOAP::max_duration_ [protected]`

Lifetime of unused delegation consumer

6.90.3.3 `int Arc::DelegationContainerSOAP::max_size_ [protected]`

Max. number of delegation consumers

6.90.3.4 `int Arc::DelegationContainerSOAP::max_usage_ [protected]`

Max. times same delegation consumer may accept credentials

6.90.3.5 `bool Arc::DelegationContainerSOAP::restricted_ [protected]`

If true all delegation phases must be performed by same identity

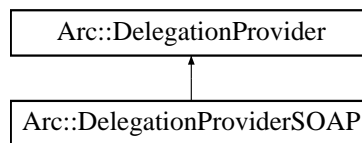
The documentation for this class was generated from the following file:

- `DelegationInterface.h`

6.91 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())

6.91.1 Detailed Description

A provider of delegated credentials. During delegation procedure this class generates new credential to be used in proxy/delegated credential.

6.91.2 Constructor & Destructor Documentation

6.91.2.1 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.

6.91.2.2 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.

6.91.3 Member Function Documentation

6.91.3.1 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. 137)

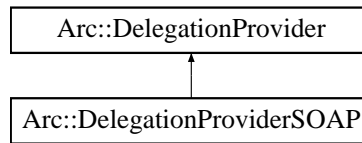
The documentation for this class was generated from the following file:

- DelegationInterface.h

6.92 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)

6.92.1 Detailed Description

Extension of **DelegationProvider** (p. 140) with SOAP exchange interface. This class is also a temporary container for intermediate information used during delegation procedure.

6.92.2 Constructor & Destructor Documentation

6.92.2.1 Arc::DelegationProviderSOAP::DelegationProviderSOAP (const std::string & credentials)

Creates instance from provided credentials. Credentials are used to sign delegated credentials.

6.92.2.2 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.

6.92.3 Member Function Documentation

6.92.3.1 **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.

6.92.3.2 **bool Arc::DelegationProviderSOAP::DelegateCredentialsInit (MCCInterface & *mcc_interface*, MessageAttributes * *attributes_in*, MessageAttributes * *attributes_out*, MessageContext * *context*)**

Extended version of **DelegateCredentialsInit(MCCInterface&,MessageContext*)** (p. 143). Additionally takes attributes for request and response message to make fine control on message processing possible.

6.92.3.3 **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.

6.92.3.4 **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.

6.92.3.5 **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.

6.92.3.6 **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. 138) instance.

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

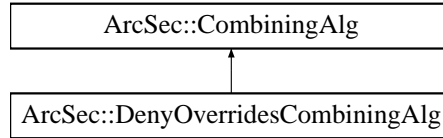
- DelegationInterface.h

6.93 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

6.93.1 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".

6.93.2 Member Function Documentation

6.93.2.1 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. 75).

6.93.2.2 virtual const std::string& ArcSec::DenyOverridesCombiningAlg::getalgId (void) const [inline, virtual]

Get the identifier

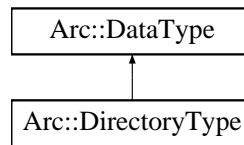
Implements **ArcSec::CombiningAlg** (p. 75).

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

- DenyOverridesAlg.h

6.94 Arc::DirectoryType Class Reference

Inheritance diagram for Arc::DirectoryType:



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

- JobDescription.h

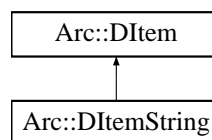
6.95 Arc::DiskSpaceRequirementType Class Reference

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

- JobDescription.h

6.96 Arc::DItem Class Reference

Inheritance diagram for Arc::DItem:

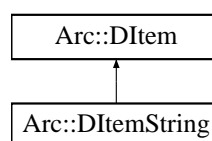


The documentation for this class was generated from the following file:

- DBranch.h

6.97 Arc::DItemString Class Reference

Inheritance diagram for Arc::DItemString:

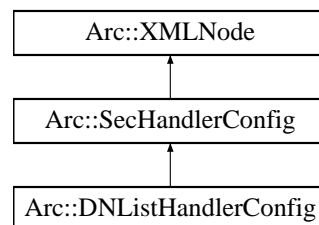


The documentation for this class was generated from the following file:

- DBranch.h

6.98 Arc::DNListHandlerConfig Class Reference

Inheritance diagram for Arc::DNListHandlerConfig:



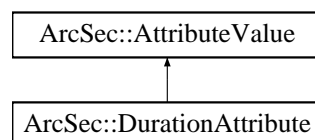
The documentation for this class was generated from the following file:

- ClientInterface.h

6.99 ArcSec::DurationAttribute Class Reference

```
#include <DateTimeAttribute.h>
```

Inheritance diagram for ArcSec::DurationAttribute:



Public Member Functions

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

6.99.1 Detailed Description

Format: P??Y??M??DT??H??M??S

6.99.2 Member Function Documentation

6.99.2.1 virtual std::string ArcSec::DurationAttribute::encode () [virtual]

encode the value in a string format

Implements `ArcSec::AttributeValue` (p. 57).

6.99.2.2 `virtual bool ArcSec::DurationAttribute::equal (AttributeValue * value, bool check_id = true) [virtual]`

Evaluate whether "this" equal to the parameter value

Implements `ArcSec::AttributeValue` (p. 57).

6.99.2.3 `virtual std::string ArcSec::DurationAttribute::getId () [inline, virtual]`

Get the AttributeId of the <Attribute>

Implements `ArcSec::AttributeValue` (p. 57).

6.99.2.4 `virtual std::string ArcSec::DurationAttribute::getType () [inline, virtual]`

Get the DataType of the <Attribute>

Implements `ArcSec::AttributeValue` (p. 57).

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

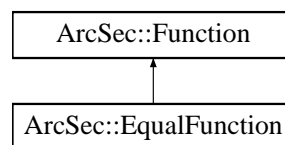
- `DateTimeAttribute.h`

6.100 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)`

6.100.1 Detailed Description

Evaluate whether the two values are equal.

6.100.2 Member Function Documentation

6.100.2.1 `virtual AttributeValue* ArcSec::EqualFunction::evaluate (AttributeValue * arg0, AttributeValue * arg1, bool check_id = true) [virtual]`

Evaluate two **AttributeValue** (p. 56) objects, and return one **AttributeValue** (p. 56) object

Implements **ArcSec::Function** (p. 167).

6.100.2.2 `virtual std::list<AttributeValue*> ArcSec::EqualFunction::evaluate (std::list< AttributeValue * > args, bool check_id = true) [virtual]`

Evaluate a list of **AttributeValue** (p. 56) objects, and return a list of Attribute objects

Implements **ArcSec::Function** (p. 167).

6.100.2.3 `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

6.101 ArcSec::EvalResult Struct Reference

Struct to record the xml node and effect, which will be used by **Evaluator** (p. 149) to get the information about which rule/policy(in xmlnode) is satisfied.

```
#include <Result.h>
```

6.101.1 Detailed Description

Struct to record the xml node and effect, which will be used by **Evaluator** (p. 149) 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

6.102 ArcSec::EvaluationCtx Class Reference

EvaluationCtx (p. 148), in charge of storing some context information for.

```
#include <EvaluationCtx.h>
```

Public Member Functions

- **EvaluationCtx** (**Request** *request)

6.102.1 Detailed Description

EvaluationCtx (p. 148), in charge of storing some context information for.

6.102.2 Constructor & Destructor Documentation

6.102.2.1 ArcSec::EvaluationCtx::EvaluationCtx (**Request** * *request*) [inline]

Construct a new **EvaluationCtx** (p. 148) based on the given request

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

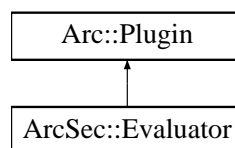
- EvaluationCtx.h

6.103 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

6.103.1 Detailed Description

Interface for policy evaluation. Execute the policy evaluation, based on the request and policy.

6.103.2 Member Function Documentation

6.103.2.1 virtual void **ArcSec::Evaluator::addPolicy** (const **Source** & *policy*, const std::string & *id* = "") [**pure virtual**]

Add policy from specified source to the evaluator. **Policy** (p. 260) will be marked with id.

6.103.2.2 virtual void **ArcSec::Evaluator::addPolicy** (**Policy** * *policy*, const std::string & *id* = "") [**pure virtual**]

Add policy to the evaluator. **Policy** (p. 260) will be marked with id. The policy object is taken over by this instance and will be destroyed in destructor.

6.103.2.3 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 policies inside the evaluator may be destroyed by this method.

6.103.2.4 virtual **Response*** **ArcSec::Evaluator::evaluate** (**Request** * *request*) [**pure virtual**]

Evaluates the request by using a **Request** (p. 269) object. Evaluation is done till at least one of policies is satisfied.

6.103.2.5 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.

6.103.2.6 virtual **Response*** **ArcSec::Evaluator::evaluate** (const **Source** & *request*) [**pure virtual**]

Evaluates the request by using a specified source

6.103.2.7 `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.

6.103.2.8 `virtual Response* ArcSec::Evaluator::evaluate (const Source & request, Policy * policyobj) [pure virtual]`

Evaluate the request from specified source against the specified policy. In some implementations all of the existing policies inside the evaluator may be destroyed by this method.

6.103.2.9 `virtual Response* ArcSec::Evaluator::evaluate (EvaluationCtx * ctx) [protected, pure virtual]`

Evaluate the request by using the **EvaluationCtx** (p. 148) object (which includes the information about request). The ctx is destroyed inside this method (why?!?!?).

6.103.2.10 `virtual AlgFactory* ArcSec::Evaluator::getAlgFactory () [pure virtual]`

Get the **AlgFactory** (p. 48) object

6.103.2.11 `virtual AttributeFactory* ArcSec::Evaluator::getAttrFactory () [pure virtual]`

Get the **AttributeFactory** (p. 52) object

6.103.2.12 `virtual FnFactory* ArcSec::Evaluator::getFnFactory () [pure virtual]`

Get the **FnFactory** (p. 165) object

6.103.2.13 `virtual const char* ArcSec::Evaluator::getName (void) const [pure virtual]`

Get the name of this evaluator

6.103.2.14 `virtual void ArcSec::Evaluator::setCombiningAlg (EvaluatorCombiningAlg alg) [pure virtual]`

Specifies one of simple combining algorithms. In case of multiple policies their results will be combined using this algorithm.

6.103.2.15 `virtual void ArcSec::Evaluator::setCombiningAlg (CombiningAlg * alg = NULL) [pure virtual]`

Specifies loadable combining algorithms. In case of multiple policies their results will be combined using this algorithm. To switch to simple algorithm specify NULL argument.

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

- `Evaluator.h`

6.104 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 * ()`

6.104.1 Detailed Description

Context for evaluator. It includes the factories which will be used to create related objects.

6.104.2 Member Function Documentation

6.104.2.1 ArcSec::EvaluatorContext::operator AlgFactory * () [inline]

Returns associated **AlgFactory** (p. 48) object

6.104.2.2 ArcSec::EvaluatorContext::operator AttributeFactory * () [inline]

Returns associated **AttributeFactory** (p. 52) object

6.104.2.3 ArcSec::EvaluatorContext::operator FnFactory * () [inline]

Returns associated **FnFactory** (p. 165) object

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

- `Evaluator.h`

6.105 ArcSec::EvaluatorLoader Class Reference

EvaluatorLoader (p. 152) is implemented as a helper class for loading different **Evaluator** (p. 149) 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)

6.105.1 Detailed Description

EvaluatorLoader (p. 152) is implemented as a helper class for loading different **Evaluator** (p. 149) objects, like ArcEvaluator. The object loading is based on the configuration information about evaluator, including information for factory class, request, policy and evaluator itself

6.105.2 Member Function Documentation

6.105.2.1 **Evaluator*** ArcSec::EvaluatorLoader::getEvaluator (const std::string & *classname*)

Get evaluator object according to the class name

6.105.2.2 **Evaluator*** ArcSec::EvaluatorLoader::getEvaluator (const **Policy** * *policy*)

Get evaluator object suitable for presented policy

6.105.2.3 **Evaluator*** ArcSec::EvaluatorLoader::getEvaluator (const **Request** * *request*)

Get evaluator object suitable for presented request

6.105.2.4 **Policy*** ArcSec::EvaluatorLoader::getPolicy (const **Source** & *polycysource*)

Get proper policy object according to the policy source

6.105.2.5 **Policy*** ArcSec::EvaluatorLoader::getPolicy (const std::string & *classname*, const **Source** & *polycysource*)

Get policy object according to the class name, based on the policy source

6.105.2.6 **Request*** ArcSec::EvaluatorLoader::getRequest (const std::string & *classname*, const **Source** & *requestsource*)

Get request object according to the class name, based on the request source

6.105.2.7 **Request*** ArcSec::EvaluatorLoader::getRequest (const **Source** & *requestsource*)

Get request object according to the request source

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

- EvaluatorLoader.h

6.106 Arc::ExecutableType Class Reference

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

- JobDescription.h

6.107 Arc::ExecutionTarget Class Reference

ExecutionTarget (p. 154).

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

Public Member Functions

- **ExecutionTarget** ()
- **ExecutionTarget** (const **ExecutionTarget** &target)
- **ExecutionTarget** (const long int addrptr)
- **ExecutionTarget** & **operator=** (const **ExecutionTarget** &target)
- **Submitter** * **GetSubmitter** (const **UserConfig** &ucfg) const
- void **Update** (const **JobDescription** &jobdesc)
- void **Print** (bool longlist) const
- void **SaveToStream** (std::ostream &out, bool longlist) const

Data Fields

- std::string **ComputingShareName**
- int64_t **MaxMainMemory**
- int64_t **MaxVirtualMemory**
- int64_t **MaxDiskSpace**
- std::map< **Period**, int > **FreeSlotsWithDuration**
- **Software** **OperatingSystem**
- std::list< **ApplicationEnvironment** > **ApplicationEnvironments**

6.107.1 Detailed Description

ExecutionTarget (p. 154). 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).

6.107.2 Constructor & Destructor Documentation

6.107.2.1 Arc::ExecutionTarget::ExecutionTarget ()

Create an **ExecutionTarget** (p. 154).

Default constructor to create an **ExecutionTarget** (p. 154). Takes no arguments.

6.107.2.2 Arc::ExecutionTarget::ExecutionTarget (const ExecutionTarget & *target*)

Create an **ExecutionTarget** (p. 154).

Copy constructor.

Parameters

target **ExecutionTarget** (p. 154) to copy.

6.107.2.3 Arc::ExecutionTarget::ExecutionTarget (const long int *addrptr*)

Create an **ExecutionTarget** (p. 154).

Copy constructor? Needed from Python?

Parameters

addrptr

6.107.3 Member Function Documentation

6.107.3.1 Submitter* Arc::ExecutionTarget::GetSubmitter (const UserConfig & *ucfg*) const

Get **Submitter** (p. 311) to the computing resource represented by the **ExecutionTarget** (p. 154).

Method which returns a specialized **Submitter** (p. 311) which can be used for submitting jobs to the computing resource represented by the **ExecutionTarget** (p. 154). In order to return the correct specialized **Submitter** (p. 311) the GridFlavour variable must be correctly set.

Parameters

ucfg **UserConfig** (p. 340) object with paths to user credentials etc.

6.107.3.2 ExecutionTarget& Arc::ExecutionTarget::operator= (const ExecutionTarget & *target*)

Create an **ExecutionTarget** (p. 154).

Assignment operator

Parameters

target is **ExecutionTarget** (p. 154) to copy.

6.107.3.3 void Arc::ExecutionTarget::Print (bool *longlist*) const

DEPRECATED: Print the **ExecutionTarget** (p. 154) information to std::cout.

This method is deprecated, use the SaveToStream method instead. Method to print the **ExecutionTarget** (p. 154) attributes to std::cout

Parameters

longlist is true for long list printing.

See also

SaveToStream (p. 156)

6.107.3.4 void Arc::ExecutionTarget::SaveToStream (std::ostream & *out*, bool *longlist*) const

Print the **ExecutionTarget** (p. 154) information to a std::ostream object.

Method to print the **ExecutionTarget** (p. 154) attributes to a std::ostream object.

Parameters

out is the std::ostream to print the attributes to.

longlist should be set to true for printing a long list.

6.107.3.5 void Arc::ExecutionTarget::Update (const JobDescription & *jobdesc*)

Update **ExecutionTarget** (p. 154) after succesful job submission.

Method to update the **ExecutionTarget** (p. 154) after a job succesfully has been submitted to the computing resource it represents. E.g. if a job is sent to the computing resource and is expected to enter the queue, then the WaitingJobs attribute is incremented with 1.

Parameters

jobdesc contains all information about the job submitted.

6.107.4 Field Documentation

6.107.4.1 std::list<ApplicationEnvironment> Arc::ExecutionTarget::ApplicationEnvironments

ApplicationEnvironments.

The ApplicationEnvironments member is a list of ApplicationEnvironment's, defined in section 6.7 GLUE2.

6.107.4.2 std::string Arc::ExecutionTarget::ComputingShareName

ComputingShareName String 0..1.

Human-readable name. This variable represents the ComputingShare.Name attribute of GLUE2.

6.107.4.3 std::map<Period, int> Arc::ExecutionTarget::FreeSlotsWithDuration

FreeSlotsWithDuration std::map<Period, int>

This attribute express the number of free slots with their time limits. The keys in the std::map are the time limit (**Period** (p. 249)) for the number of free slots stored as the value (int). If no time limit has been specified for a set of free slots then the key will equal Period(LONG_MAX).

6.107.4.4 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.

6.107.4.5 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.

6.107.4.6 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.

6.107.4.7 Software Arc::ExecutionTarget::OperatingSystem

OperatingSystem.

The OperatingSystem member is not present in GLUE2 but contains the three GLUE2 attributes OSFamily, OSName and OSVersion.

- OSFamily OSFamily_t 1 * The general family to which the Execution Environment operating * system belongs.
- OSName OSName_t 0..1 * The specific name of the operating sytem
- OSVersion String 0..1 * The version of the operating system, as defined by the vendor.

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

- ExecutionTarget.h

6.108 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**

6.108.1 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.

6.108.2 Member Function Documentation

6.108.2.1 `Glib::TimeVal Arc::ExpirationReminder::getExpiryTime () const`

Returns the expiry time.

This method returns the expiry time of the reservation that this **ExpirationReminder** (p. 157) is associated with.

Returns

The expiry time.

6.108.2.2 `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. 157) is associated with.

Returns

The identification number.

6.108.2.3 `bool Arc::ExpirationReminder::operator< (const ExpirationReminder & other) const`

Less than operator, compares "soonness".

This is the less than operator for the **ExpirationReminder** (p. 157) class. It compares the priority of such objects with respect to which reservation expires first. It is used when reminder objects are inserted in a priority queue in order to allways place the next reservation to expire at the top.

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

- Counter.h

6.109 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** (std::vector< std::string > caches, std::vector< std::string > remote_caches, std::vector< std::string > draining_caches, std::string id, uid_t job_uid, gid_t job_gid, int cache_max=100, int cache_min=100)
- **FileCache** ()
- bool **Start** (std::string url, bool &available, bool &is_locked, bool use_remote=true)
- 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 **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)

6.109.1 Detailed Description

FileCache (p. 158) 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. 163) should be called, so that the cache file can be prepared and locked. When a transfer has finished successfully, **Link**() (p. 162) or **Copy**() (p. 161) 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. 163) 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. 330) 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. 330) 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.330) 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. 163) creates this lock and **Stop**() (p. 163) releases it. All processes calling **Start**() (p. 163) must wait until they successfully obtain the lock before downloading can begin.

6.109.2 Constructor & Destructor Documentation

6.109.2.1 `Arc::FileCache::FileCache (std::string cache_path, std::string id, uid_t job_uid, gid_t job_gid)`

Create a new **FileCache** (p. 158) 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

6.109.2.2 `Arc::FileCache::FileCache (std::vector< std::string > caches, std::string id, uid_t job_uid, gid_t job_gid)`

Create a new **FileCache** (p. 158) 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

6.109.2.3 `Arc::FileCache::FileCache (std::vector< std::string > caches, std::vector< std::string > remote_caches, std::vector< std::string > draining_caches, std::string id, uid_t job_uid, gid_t job_gid, int cache_max = 100, int cache_min = 100)`

Create a new **FileCache** (p. 158) instance with multiple cache dirs, remote caches and draining cache directories.

Parameters

caches a vector of strings describing caches. The format of each string is "cache_dir[link_path]".

remote_caches Same format as caches. These are the paths to caches which are under the control of other Grid Managers and are read-only for this process.

draining_caches Same format as caches. These are the paths to caches which are to be drained.

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

cache_max maximum used space by cache, as percentage of the file system

cache_min minimum used space by cache, as percentage of the file system

6.109.2.4 Arc::FileCache::FileCache () [inline]

Default constructor. Invalid cache.

6.109.3 Member Function Documentation

6.109.3.1 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

6.109.3.2 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

6.109.3.3 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

6.109.3.4 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

6.109.3.5 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

6.109.3.6 std::string Arc::FileCache::File (std::string *url*)

Returns the full pathname of the file in the cache which corresponds to the given url.

6.109.3.7 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

6.109.3.8 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

6.109.3.9 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. 162).

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

6.109.3.10 Arc::FileCache::operator bool (void) [inline]

Returns true if object is useable.

6.109.3.11 bool Arc::FileCache::operator== (const FileCache & *a*)

Return true if all attributes are equal

6.109.3.12 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.

6.109.3.13 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

6.109.3.14 `bool Arc::FileCache::Start (std::string url, bool & available, bool & is_locked, bool use_remote = true)`

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

remote_caches Same format as `caches`. These are the paths to caches which are under the control of other Grid Managers and are read-only for this process.

6.109.3.15 `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. 163) 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. 163)), or if it fails to delete the lock file.

Parameters

url the url of the file that was downloaded

6.109.3.16 `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. 163).

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

6.110 FileCacheHash Class Reference

```
#include <FileCacheHash.h>
```

Static Public Member Functions

- static std::string **getHash** (std::string url)
- static int **maxLength** ()

6.110.1 Detailed Description

FileCacheHash (p. 163) provides methods to make hashes from strings. Currently the md5 hash from the openssl library is used.

6.110.2 Member Function Documentation

6.110.2.1 static std::string FileCacheHash::getHash (std::string *url*) [static]

Return a hash of the given URL, according to the current hash scheme.

6.110.2.2 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

6.111 Arc::FileInfo Class Reference

FileInfo (p. 164) stores information about files (metadata).

```
#include <FileInfo.h>
```

6.111.1 Detailed Description

FileInfo (p. 164) stores information about files (metadata).

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

- FileInfo.h

6.112 Arc::FileLock Class Reference

A general file locking class.

```
#include <FileLock.h>
```

Public Member Functions

- **FileLock** (const std::string &filename)
- **~FileLock** ()
- **operator bool** ()
- **bool operator!** ()

6.112.1 Detailed Description

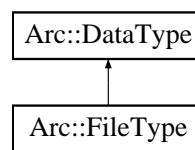
A general file locking class.

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

- FileLock.h

6.113 Arc::FileType Class Reference

Inheritance diagram for Arc::FileType:



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

- JobDescription.h

6.114 Arc::FinderLoader Class Reference

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

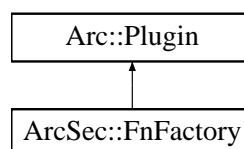
- FinderLoader.h

6.115 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

6.115.1 Detailed Description

Interface for function factory class. **FnFactory** (p. 165) is in charge of creating **Function** (p. 166) 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. 166) objects.

6.115.2 Member Function Documentation

6.115.2.1 `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. 166)

Returns

The object of **Function** (p. 166)

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

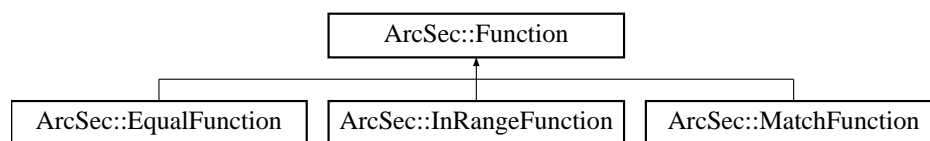
- FnFactory.h

6.116 ArcSec::Function Class Reference

Interface for function, which is in charge of evaluating two **AttributeValue** (p. 56).

```
#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

6.116.1 Detailed Description

Interface for function, which is in charge of evaluating two **AttributeValue** (p. 56).

6.116.2 Member Function Documentation

6.116.2.1 `virtual AttributeValue* ArcSec::Function::evaluate (AttributeValue * arg0, AttributeValue * arg1, bool check_id = true) [pure virtual]`

Evaluate two **AttributeValue** (p. 56) objects, and return one **AttributeValue** (p. 56) object

Implemented in **ArcSec::EqualFunction** (p. 148), **ArcSec::InRangeFunction** (p. 179), and **ArcSec::MatchFunction** (p. 207).

6.116.2.2 `virtual std::list<AttributeValue*> ArcSec::Function::evaluate (std::list< AttributeValue * > args, bool check_id = true) [pure virtual]`

Evaluate a list of **AttributeValue** (p. 56) objects, and return a list of Attribute objects

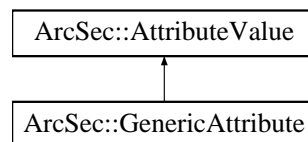
Implemented in **ArcSec::EqualFunction** (p. 148), **ArcSec::InRangeFunction** (p. 179), and **ArcSec::MatchFunction** (p. 207).

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

- Function.h

6.117 ArcSec::GenericAttribute Class Reference

Inheritance diagram for ArcSec::GenericAttribute:



Public Member Functions

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

6.117.1 Member Function Documentation

6.117.1.1 `virtual std::string ArcSec::GenericAttribute::encode () [inline, virtual]`

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 57).

6.117.1.2 `virtual bool ArcSec::GenericAttribute::equal (AttributeValue * value, bool check_id = true) [virtual]`

Evaluate whether "this" equals to the parameter value

Implements **ArcSec::AttributeValue** (p. 57).

6.117.1.3 `virtual std::string ArcSec::GenericAttribute::getId () [inline, virtual]`

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

6.117.1.4 `virtual std::string ArcSec::GenericAttribute::getType () [inline, virtual]`

Get the DataType of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

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

- GenericAttribute.h

6.118 Arc::GlobusResult Class Reference

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

- GlobusErrorUtils.h

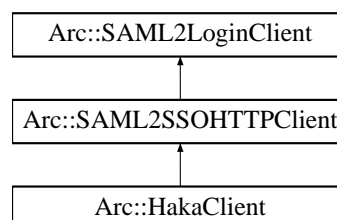
6.119 Arc::GSSCredential Class Reference

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

- GSSCredential.h

6.120 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** ()

6.120.1 Member Function Documentation

6.120.1.1 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. 279).

6.120.1.2 MCC_Status Arc::HakaClient::processIdP2Confusa () [protected, virtual]

Redirects the user back from identity provider to the Confusa SP

Implements **Arc::SAML2SSOHTTPClient** (p. 279).

6.120.1.3 MCC_Status Arc::HakaClient::processIdPLogin (const std::string *username*, const std::string *password*) [protected, virtual]

Actual identity provider parsers for next three methods implemented in subdirectory idp/

Parse identity provider login page and submit username and password in the previsioned way

Implements **Arc::SAML2SSOHTTPClient** (p. 279).

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

- HakaClient.h

6.121 Arc::HTTPClientInfo Struct Reference

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

- ClientInterface.h

6.122 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)

6.122.1 Detailed Description

Stores XML document in filesystem split into parts.

6.122.2 Constructor & Destructor Documentation

6.122.2.1 Arc::InfoCache::InfoCache (const Config & *cfg*, const std::string & *service_id*)

Creates object according to configuration (see InfoCacheConfig.xsd).

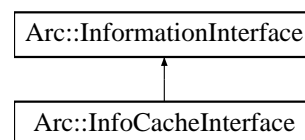
XML configuration is passed in *cfg*. Argument *service_id* is used to distinguish between various documents stored under same path - corresponding files will be stored in subdirectory with *service_id* name.

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

- InfoCache.h

6.123 Arc::InfoCacheInterface Class Reference

Inheritance diagram for Arc::InfoCacheInterface:



Protected Member Functions

- virtual void **Get** (const std::list< std::string > &*path*, XMLNodeContainer &*result*)

6.123.1 Member Function Documentation

6.123.1.1 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. 176).

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

- InfoCache.h

6.124 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

6.124.1 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.

6.124.2 Constructor & Destructor Documentation

6.124.2.1 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.

6.124.3 Member Function Documentation

6.124.3.1 bool Arc::InfoFilter::Filter (XMLNode doc) const

Filter information document according to internal policies.

In provided document all policies and nodes which have their policies evaluated to negative result are removed.

6.124.3.2 bool Arc::InfoFilter::Filter (XMLNode doc, const InfoFilterPolicies & policies, const NS & ns) const

Filter information document according to internal and external policies.

In provided document all policies and nodes which have their policies evaluated to negative result are removed. External policies are provided in policies argument. First element of every pair is XPath defining to which XML node policy must be applied. Second element is policy itself. Argument ns defines XML namespaces for XPath evaluation.

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

- InfoFilter.h

6.125 Arc::InfoRegister Class Reference

Registration to ISIS interface.

```
#include <InfoRegister.h>
```

6.125.1 Detailed Description

Registration to ISIS interface. This class represents service registering to Information Indexing **Service** (p. 288). 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

6.126 Arc::InfoRegisterContainer Class Reference

```
#include <InfoRegister.h>
```

Public Member Functions

- **InfoRegistrar** * **addRegistrar** (**XMLNode** doc)
- void **addService** (**InfoRegister** *reg, const std::list< std::string > &ids, **XMLNode** cfg=**XMLNode**())
- void **removeService** (**InfoRegister** *reg)

6.126.1 Detailed Description

Singleton class for scanning configuration and storing references to registration elements.

6.126.2 Member Function Documentation

6.126.2.1 InfoRegistrar* Arc::InfoRegisterContainer::addRegistrar (XMLNode doc)

Adds ISISes to list of handled services.

Supplied configuration document is scanned for **InfoRegistrar** (p. 173) elements and those are turned into **InfoRegistrar** (p. 173) classes for handling connection to ISIS service each.

6.126.2.2 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.

6.126.2.3 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

6.127 Arc::InfoRegisters Class Reference

Handling multiple registrations to ISISes.

```
#include <InfoRegister.h>
```

Public Member Functions

- **InfoRegisters** (XMLNode &cfg, Service *service_)

6.127.1 Detailed Description

Handling multiple registrations to ISISes.

6.127.2 Constructor & Destructor Documentation

6.127.2.1 Arc::InfoRegisters::InfoRegisters (XMLNode & cfg, Service * service_)

Constructor creates **InfoRegister** (p. 171) objects according to configuration.

Inside cfg elements InfoRegistration are found and for each corresponding **InfoRegister** (p. 171) 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

6.128 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 *)

6.128.1 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. 173).

6.128.2 Member Function Documentation

6.128.2.1 `bool Arc::InfoRegistrar::addService (InfoRegister *, XMLNode &)`

Adds new service to list of handled services.

Service (p. 288) is described by it's **InfoRegister** (p. 171) object which must be valid as long as this object is functional.

6.128.2.2 `void Arc::InfoRegistrar::registration (void)`

Performs registartion in a loop.

Never exits unless there is a critical error or requested by destructor.

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

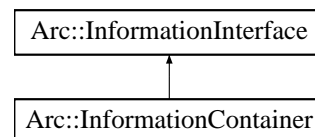
- InfoRegister.h

6.129 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_**

6.129.1 Detailed Description

Information System document container and processor. This class inherits form **InformationInterface** (p. 175) and offers container for storing informational XML document.

6.129.2 Constructor & Destructor Documentation

6.129.2.1 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.

6.129.3 Member Function Documentation

6.129.3.1 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()

6.129.3.2 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.

6.129.3.3 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. 176).

6.129.4 Field Documentation

6.129.4.1 XMLNode Arc::InformationContainer::doc_ [protected]

Either link or container of XML document

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

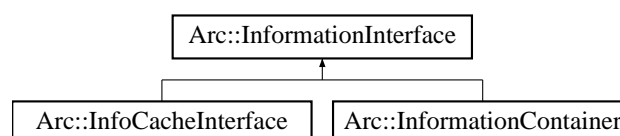
- InformationInterface.h

6.130 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_**

6.130.1 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.

6.130.2 Constructor & Destructor Documentation

6.130.2.1 Arc::InformationInterface::InformationInterface (bool *safe* = *true*)

Constructor. If 'safe' is true all calls to Get will be locked.

6.130.3 Member Function Documentation

6.130.3.1 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. 170), and **Arc::InformationContainer** (p. 175).

6.130.4 Field Documentation

6.130.4.1 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

6.131 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)

6.131.1 Detailed Description

Request for information in InfoSystem. This is a convenience wrapper creating proper WS-ResourceProperties request targeted InfoSystem interface of service.

6.131.2 Constructor & Destructor Documentation

6.131.2.1 Arc::InformationRequest::InformationRequest (void)

Dummy constructor

6.131.2.2 Arc::InformationRequest::InformationRequest (const std::list< std::string > & path)

Request for attribute specified by elements of path. Currently only first element is used.

6.131.2.3 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.

6.131.2.4 Arc::InformationRequest::InformationRequest (XMLNode query)

Request for attributes specified by XPath query.

6.131.3 Member Function Documentation

6.131.3.1 SOAPEnvelope* Arc::InformationRequest::SOAP (void)

Returns generated SOAP message

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

- InformationInterface.h

6.132 Arc::InformationResponse Class Reference

Informational response from InfoSystem.

```
#include <InformationInterface.h>
```

Public Member Functions

- **InformationResponse** (SOAPEnvelope &soap)
- std::list< **XMLNode** > **Result** (void)

6.132.1 Detailed Description

Informational response from InfoSystem. This is a convenience wrapper analyzing WS-ResourceProperties response from InfoSystem interface of service.

6.132.2 Constructor & Destructor Documentation

6.132.2.1 Arc::InformationResponse::InformationResponse (SOAPEnvelope & soap)

Constructor parses WS-ResourceProperties response. Provided SOAPEnvelope object must be valid as long as this object is in use.

6.132.3 Member Function Documentation

6.132.3.1 std::list<XMLNode> Arc::InformationResponse::Result (void)

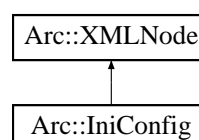
Returns set of attributes which were in SOAP message passed to constructor.

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

- InformationInterface.h

6.133 Arc::IniConfig Class Reference

Inheritance diagram for Arc::IniConfig:



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

- IniConfig.h

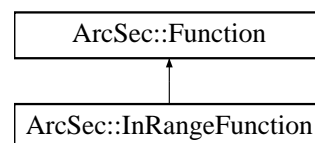
6.134 Arc::initializeCredentialsType Class Reference

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

- UserConfig.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 **AttributeValue*** ArcSec::InRangeFunction::evaluate (**AttributeValue** * *arg0*, **AttributeValue** * *arg1*, bool *check_id* = *true*) [virtual]

Evaluate two **AttributeValue** (p. 56) objects, and return one **AttributeValue** (p. 56) object

Implements **ArcSec::Function** (p. 167).

6.135.1.2 virtual std::list<**AttributeValue***> ArcSec::InRangeFunction::evaluate (std::list< **AttributeValue** * > *args*, bool *check_id* = *true*) [virtual]

Evaluate a list of **AttributeValue** (p. 56) objects, and return a list of Attribute objects

Implements **ArcSec::Function** (p. 167).

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

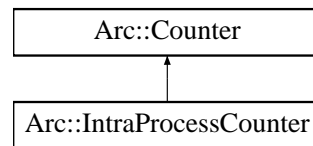
- InRangeFunction.h

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. 80) 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. 179) 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. 179) 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. 87) that corresponds to the reservation.

Parameters

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

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. 83).

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. 83).

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. 87) 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.

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. 84).

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. 85).

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. 86).

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

Implements **Arc::Counter** (p. 86).

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. 86).

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. 87).

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::JobDescriptionParserLoader::iterator Class Reference

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

- JobDescriptionParser.h

6.140 Arc::Job Class Reference

Job (p. 184).

```
#include <Job.h>
```

Public Member Functions

- **Job** ()
- void **Print** (bool longlist) const
- void **SaveToStream** (std::ostream &out, bool longlist) const
- **Job** & **operator=** (XMLNode job)
- void **ToXML** (XMLNode job) const

6.140.1 Detailed Description

Job (p. 184). This class describe a Grid job. Most of the members contained in this class are directly linked to the ComputingActivity defined in the GLUE Specification v. 2.0 (GFD-R-P.147).

6.140.2 Constructor & Destructor Documentation

6.140.2.1 Arc::Job::Job ()

Create a **Job** (p. 184) object.

Default constructor. Takes no arguments.

6.140.3 Member Function Documentation

6.140.3.1 Job& Arc::Job::operator= (XMLNode *job*)

Set **Job** (p. 184) attributes from a **XMLNode** (p. 399).

The attributes of the **Job** (p. 184) object is set to the values specified in the **XMLNode** (p. 399). The **XMLNode** (p. 399) should be a ComputingActivity type using the GLUE2 XML hierarchical rendering, see <http://forge.gridforum.org/sf/wiki/do/viewPage/projects.glue-wg/wiki/GLUE2XMLSchema> for more information. Note that associations are not parsed.

Parameters

job is a **XMLNode** (p. 399) of GLUE2 ComputingActivity type.

See also

ToXML (p. 186)

6.140.3.2 void Arc::Job::Print (bool *longlist*) const

DEPRECATED: Print the **Job** (p. 184) information to std::cout.

This method is DEPRECATED, use the SaveToStream method instead. Method to print the **Job** (p. 184) attributes to std::cout

Parameters

longlist is boolean for long listing (more details).

See also

SaveToStream (p. 185)

6.140.3.3 void Arc::Job::SaveToStream (std::ostream & *out*, bool *longlist*) const

Write job information to a std::ostream object.

This method will write job information to the passed std::ostream object. The longlist boolean specifies whether more (true) or less (false) information should be printed.

Parameters

out is the std::ostream object to print the attributes to.

longlist is a boolean for switching on long listing (more details).

6.140.3.4 void Arc::Job::ToXML (XMLNode *job*) const

Add job information to a **XMLNode** (p. 399).

Child nodes of GLUE ComputingActivity type containing job information of this object will be added to the passed **XMLNode** (p. 399).

Parameters

job is the **XMLNode** (p. 399) to add job information to in form of GLUE2 ComputingActivity type child nodes.

See also

operator=

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

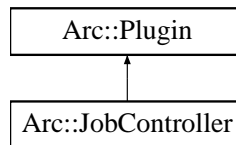
- Job.h

6.141 Arc::JobController Class Reference

Base class for the JobControllers.

```
#include <JobController.h>
```

Inheritance diagram for Arc::JobController:



Public Member Functions

- void **FillJobStore** (const std::list< **URL** > &jobids)
- bool **Cat** (const std::list< std::string > &status, const std::string &whichfile)
- bool **Cat** (std::ostream &out, const std::list< std::string > &status, const std::string &whichfile)
- bool **PrintJobStatus** (const std::list< std::string > &status, const bool longlist)
- bool **SaveJobStatusToStream** (std::ostream &out, const std::list< std::string > &status, bool longlist)
- bool **Migrate** (**TargetGenerator** &targetGen, **Broker** *broker, const **UserConfig** &usercfg, const bool forcemigration, std::list< **URL** > &migratedJobIDs)

6.141.1 Detailed Description

Base class for the JobControllers. The **JobController** (p. 186) is the base class for middleware specialized derived classes. The **JobController** (p. 186) base class is also the implementer of all public functionality that should be offered by the middleware specific specializations. In other words all virtual functions of the **JobController** (p. 186) are private. The initialization of a (specialized) **JobController** (p. 186) object takes

two steps. First the **JobController** (p. 186) specialization for the required grid flavour must be loaded by the **JobControllerLoader** (p. 189), which sees to that the **JobController** (p. 186) receives information about its Grid flavour and the local joblist file containing information about all active jobs (flavour independent). The next step is the filling of the **JobController** (p. 186) job pool (JobStore) which is the pool of jobs that the **JobController** (p. 186) can manage. Must be specialised for each supported middleware flavour.

6.141.2 Member Function Documentation

6.141.2.1 `bool Arc::JobController::Cat (const std::list< std::string > & status, const std::string & whichfile)`

DEPRECATED: Catenate a log-file to standard out.

This method is DEPRECATED, use the `Cat(std::ostream&, const std::list<std::string>&, const std::string&)` (p. 187) instead.

This method is not supposed to be overloaded by extending classes.

Parameters

status a list of strings representing states to be considered.

longlist a boolean indicating whether verbose job information should be printed.

Returns

This method always returns true.

See also

`Cat(std::ostream&, const std::list<std::string>&, const std::string&)` (p. 187)

`GetJobInformation`

`JobState` (p. 194)

6.141.2.2 `bool Arc::JobController::Cat (std::ostream & out, const std::list< std::string > & status, const std::string & whichfile)`

Catenate a output log-file to a std::ostream object.

The method catenates one of the log-files standard out or error, or the job log file from the CE for each of the jobs contained in this object. A file can only be catenated if the location relative to the session directory are set in `Job::StdOut`, `Job::StdErr` and `Job::LogDir` respectively, and if supported so in the specialised ACC module. If the status parameter is non-empty only jobs having a job status specified in this list will be considered. The whichfile parameter specifies what log-file to catenate. Possible values are "stdout", "stderr" and "joblog" respectively specifying standard out, error and job log file.

This method is not supposed to be overloaded by extending classes.

Parameters

status a list of strings representing states to be considered.

longlist a boolean indicating whether verbose job information should be printed.

Returns

This method always returns true.

See also

SaveJobStatusToStream (p. 189)
GetJobInformation
JobState (p. 194)

6.141.2.3 void Arc::JobController::FillJobStore (const std::list< URL > & *jobids*)

Fill jobstore.

Method to fill the jobstore with jobs that should be managed.

Parameters

jobids List of jobids to be loaded to the jobstore. If empty all jobs of the specialized grid flavour present in the joblist file (given through the *usercfg* to the constructor) will be loaded to the jobstore.

6.141.2.4 bool Arc::JobController::Migrate (TargetGenerator & *targetGen*, Broker * *broker*, const UserConfig & *usercfg*, const bool *forcemigration*, std::list< URL > & *migratedJobIDs*)

Migrate job from cluster A to Cluster B.

Method to migrate the jobs contained in the jobstore.

Parameters

targetGen **TargetGenerator** (p. 314) with targets to migrate the job to.

broker **Broker** (p. 62) to be used when selecting target.

forcemigration boolean which specifies whether a migrated job should persist if the new cluster does not succeed sending a kill/terminate request for the job.

6.141.2.5 bool Arc::JobController::PrintJobStatus (const std::list< std::string > & *status*, const bool *longlist*)

DEPRECATED: Print job status to std::cout.

This method is DEPRECATED, use the SaveJobStatusToStream instead.

This method is not supposed to be overloaded by extending classes.

Parameters

status a list of strings representing states to be considered.

longlist a boolean indicating whether verbose job information should be printed.

Returns

This method always returns true.

See also

SaveJobStatusToStream (p. 189)
GetJobInformation
JobState (p. 194)

6.141.2.6 bool Arc::JobController::SaveJobStatusToStream (std::ostream & *out*, const std::list< std::string > & *status*, bool *longlist*)

Print job status to a std::ostream object.

The job status is printed to a std::ostream object when calling this method. More specifically the **Job::SaveToStream** (p. 185) method is called on each of the **Job** (p. 184) objects stored in this object, and the boolean argument *longlist* is passed directly to the method indicating whether verbose job status should be printed. The *status* argument is a list of strings each representing a job state (**JobState** (p. 194)) which is used to indicate that only jobs with a job state in the list should be considered. If the list *status* is empty all jobs will be considered.

This method is not supposed to be overloaded by extending classes.

Parameters

out a std::ostream object to direct job status information to.

status a list of strings representing states to be considered.

longlist a boolean indicating whether verbose job information should be printed.

Returns

This method always returns true.

See also

[GetJobInformation](#)

[Job::SaveToStream](#) (p. 185)

[JobState](#) (p. 194)

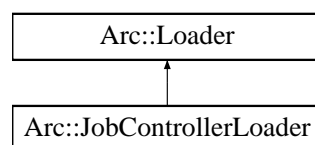
The documentation for this class was generated from the following file:

- 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 **UserConfig** &usercfg)
- const std::list< **JobController** * > & **GetJobControllers** () const

6.142.1 Detailed Description

Class responsible for loading **JobController** (p. 186) plugins The **JobController** (p. 186) objects returned by a **JobControllerLoader** (p. 189) must not be used after the **JobControllerLoader** (p. 189) goes out of scope.

6.142.2 Constructor & Destructor Documentation

6.142.2.1 `Arc::JobControllerLoader::JobControllerLoader ()`

Constructor Creates a new **JobControllerLoader** (p. 189).

6.142.2.2 `Arc::JobControllerLoader::~~JobControllerLoader ()`

Destructor Calling the destructor destroys all JobControllers loaded by the **JobControllerLoader** (p. 189) 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.

Referenced by `Arc::JobSupervisor::GetJobControllers()`.

6.142.3.2 `JobController* Arc::JobControllerLoader::load (const std::string & name, const UserConfig & usercfg)`

Load a new **JobController** (p. 186)

Parameters

name The name of the **JobController** (p. 186) to load.

usercfg The **UserConfig** (p. 340) object for the new **JobController** (p. 186).

Returns

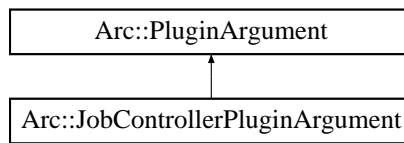
A pointer to the new **JobController** (p. 186) (NULL on error).

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

Public Member Functions

- void **Print** (bool longlist=false) const
- bool **SaveToStream** (std::ostream &out, const std::string &format) const

6.144.1 Member Function Documentation

6.144.1.1 void Arc::JobDescription::Print (bool *longlist* = *false*) const

DEPRECATED: Print all values to standard output.

This method is DEPRECATED, use the SaveToStream method instead.

Parameters

longlist

See also

SaveToStream (p. 191)

6.144.1.2 bool Arc::JobDescription::SaveToStream (std::ostream & *out*, const std::string & *format*) const

Print job description to a std::ostream object.

The job description will be written to the passed std::ostream object out in the format indicated by the format parameter. The format parameter should specify the format of one of the job description languages supported by the library. Or by specifying the special "user" or "userlong" format the job description will be written as a attribute/value pair list with respectively less or more attributes.

The mote

Returns

true if writing the job description to the out object succeeds, otherwise false.

Parameters

out a `std::ostream` reference specifying the ostream to write the job description to.

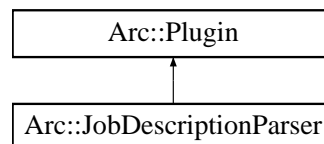
format specifies the format the job description should be written in.

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

- JobDescription.h

6.145 Arc::JobDescriptionParser Class Reference

Inheritance diagram for Arc::JobDescriptionParser:



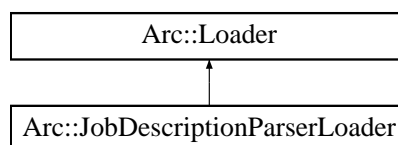
The documentation for this class was generated from the following file:

- JobDescriptionParser.h

6.146 Arc::JobDescriptionParserLoader Class Reference

```
#include <JobDescriptionParser.h>
```

Inheritance diagram for Arc::JobDescriptionParserLoader:



Data Structures

- class `iterator`

Public Member Functions

- `JobDescriptionParserLoader()`
- `~JobDescriptionParserLoader()`
- `JobDescriptionParser * load(const std::string &name)`
- `const std::list< JobDescriptionParser * > & GetJobDescriptionParsers() const`

6.146.1 Detailed Description

Class responsible for loading **JobDescriptionParser** (p. 192) plugins The **JobDescriptionParser** (p. 192) objects returned by a **JobDescriptionParserLoader** (p. 192) must not be used after the **JobDescriptionParserLoader** (p. 192) goes out of scope.

6.146.2 Constructor & Destructor Documentation

6.146.2.1 Arc::JobDescriptionParserLoader::JobDescriptionParserLoader ()

Constructor Creates a new **JobDescriptionParserLoader** (p. 192).

6.146.2.2 Arc::JobDescriptionParserLoader::~~JobDescriptionParserLoader ()

Destructor Calling the destructor destroys all **JobDescriptionParser** (p. 192) object loaded by the **JobDescriptionParserLoader** (p. 192) instance.

6.146.3 Member Function Documentation

6.146.3.1 const std::list<JobDescriptionParser*>& Arc::JobDescriptionParserLoader::GetJobDescriptionParsers () const [inline]

Retrieve the list of loaded **JobDescriptionParser** (p. 192) objects.

Returns

A reference to the list of **JobDescriptionParser** (p. 192) objects.

6.146.3.2 JobDescriptionParser* Arc::JobDescriptionParserLoader::load (const std::string & name)

Load a new **JobDescriptionParser** (p. 192)

Parameters

name The name of the **JobDescriptionParser** (p. 192) to load.

Returns

A pointer to the new **JobDescriptionParser** (p. 192) (NULL on error).

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

- JobDescriptionParser.h

6.147 Arc::JobIdentificationType Class Reference

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

- JobDescription.h

6.148 Arc::JobMetaType Class Reference

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

- JobDescription.h

6.149 Arc::JobState Class Reference

```
#include <JobState.h>
```

6.149.1 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. 194):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

6.150 Arc::JobSupervisor Class Reference

% **JobSupervisor** (p. 194) class

```
#include <JobSupervisor.h>
```

Public Member Functions

- **JobSupervisor** (const **UserConfig** &usercfg, const std::list< std::string > &jobs)
- const std::list< **JobController** * > & **GetJobControllers** ()

6.150.1 Detailed Description

% **JobSupervisor** (p. 194) class The **JobSupervisor** (p. 194) class is tool for loading **JobController** (p. 186) plugins for managing Grid jobs.

6.150.2 Constructor & Destructor Documentation

6.150.2.1 Arc::JobSupervisor::JobSupervisor (const UserConfig & usercfg, const std::list< std::string > & jobs)

Create a **JobSupervisor** (p. 194) object.

Default constructor to create a **JobSupervisor** (p. 194). Automatically loads **JobController** (p. 186) plugins based upon the input jobids.

Parameters

usercfg Reference to **UserConfig** (p. 340) object with information about user credentials and joblist-file.

jobs List of jobs(jobid or job name) to be managed.

6.150.3 Member Function Documentation**6.150.3.1 const std::list<JobController*>& Arc::JobSupervisor::GetJobControllers ()
[inline]**

Get list of JobControllers.

Method to get the list of JobControllers loaded by constructor.

References Arc::JobControllerLoader::GetJobControllers().

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

- JobSupervisor.h

6.151 Arc::LoadableModuleDescription Class Reference

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

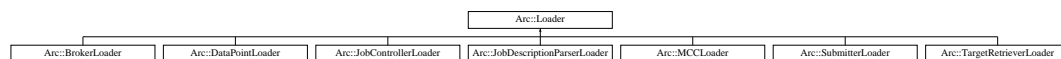
- ModuleManager.h

6.152 Arc::Loader Class Reference

Plugins loader.

```
#include <Loader.h>
```

Inheritance diagram for Arc::Loader:

**Public Member Functions**

- **Loader** (XMLNode cfg)
- **~Loader** ()

Protected Attributes

- **PluginsFactory * factory_**

6.152.1 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.

6.152.2 Constructor & Destructor Documentation

6.152.2.1 `Arc::Loader::Loader (XMLNode cfg)`

Constructor that takes whole XML configuration and performs common configuration part

6.152.2.2 `Arc::Loader::~~Loader ()`

Destructor destroys all components created by constructor

6.152.3 Field Documentation

6.152.3.1 `PluginsFactory* Arc::Loader::factory_ [protected]`

Link to Factory responsible for loading and creation of **Plugin** (p. 255) and derived objects

Referenced by `Arc::ChainContext::operator PluginsFactory *`.

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

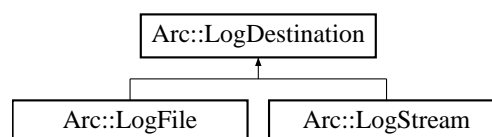
- `Loader.h`

6.153 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)

6.153.1 Detailed Description

A base class for log destinations. This class defines an interface for LogDestinations. **LogDestination** (p. 196) objects will typically contain synchronization mechanisms and should therefore never be copied.

6.153.2 Constructor & Destructor Documentation

6.153.2.1 Arc::LogDestination::LogDestination () [protected]

Default constructor.

This destination will use the default locale.

6.153.2.2 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:

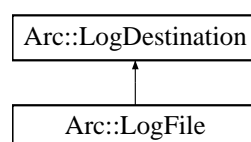
- Logger.h

6.154 Arc::LogFile Class Reference

A class for logging to files.

```
#include <Logger.h>
```

Inheritance diagram for Arc::LogFile:



Public Member Functions

- **LogFile** (const std::string &path)
- **LogFile** (const std::string &path, const std::string &locale)
- void **setMaxSize** (int newsize)
- void **setBackups** (int newbackup)
- void **setReopen** (bool newreopen)
- **operator bool** (void)
- bool **operator!** (void)
- virtual void **log** (const **LogMessage** &message)

6.154.1 Detailed Description

A class for logging to files. This class is used for logging to files. It provides synchronization in order to prevent different LogMessages to appear mixed with each other in the stream. It is possible to limit size of created file. Whenever specified size is exceeded file is deleted and new one is created. Old files may be moved into backup files instead of being deleted. Those files have names same as initial file with additional number suffix - similar to those found in /var/log of many Unix-like systems.

6.154.2 Constructor & Destructor Documentation

6.154.2.1 Arc::LogFile::LogFile (const std::string & *path*)

Creates a **LogFile** (p. 197) connected to a file.

Creates a **LogFile** (p. 197) connected to the file located at specified path. In order not to break synchronization, it is important not to connect more than one **LogFile** (p. 197) object to a certain file. If file does not exist it will be created.

Parameters

path The path to file to which to write LogMessages.

6.154.2.2 Arc::LogFile::LogFile (const std::string & *path*, const std::string & *locale*)

Creates a **LogFile** (p. 197) connected to a file.

Creates a **LogFile** (p. 197) connected to the file located at specified path. The output will be localised to the specified locale.

6.154.3 Member Function Documentation

6.154.3.1 virtual void Arc::LogFile::log (const LogMessage & *message*) [virtual]

Writes a **LogMessage** (p. 203) to the file.

This method writes a **LogMessage** (p. 203) to the file that is connected to this **LogFile** (p. 197) object. If after writing size of file exceeds one set by **setMaxSize()** (p. 198) file is moved to backup and new one is created.

Parameters

message The **LogMessage** (p. 203) to write.

Implements **Arc::LogDestination** (p. 196).

6.154.3.2 void Arc::LogFile::setBackups (int *newbackup*)

Set number of backups to store.

Set number of backups to store. When file size exceeds one specified with **setMaxSize()** (p. 198) file is closed and moved to one named path.1. If path.1 exists it is moved to path.2 and so on. Number of path.# files is one set in newbackup.

Parameters

newbackup Number of backup files.

6.154.3.3 void Arc::LogFile::setMaxSize (int *newsize*)

Set maximal allowed size of file.

Set maximal allowed size of file. This value is not obeyed exactly. Specified size may be exceeded by amount of one **LogMessage** (p. 203). To disable limit specify -1.

Parameters

newsize Max size of log file.

6.154.3.4 void Arc::LogFile::setReopen (bool *newreopen*)

Set file reopen on every write.

Set file reopen on every write. If set to true file is opened before writing every log record and closed afterward.

Parameters

newreopen If file to be reopened for every log record.

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

- Logger.h

6.155 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 **addDestinations** (const std::list< **LogDestination** * > &destinations)
- const std::list< **LogDestination** * > &**getDestinations** (void) const
- void **removeDestinations** (void)
- void **setThreshold** (**LogLevel** threshold)
- **LogLevel** **getThreshold** () const
- void **setThreadContext** (void)
- void **msg** (**LogMessage** message)
- void **msg** (**LogLevel** level, const std::string &str)

Static Public Member Functions

- static **Logger** & **getRootLogger** ()
- static void **setThresholdForDomain** (**LogLevel** threshold, const std::list< std::string > &subdomains)
- static void **setThresholdForDomain** (**LogLevel** threshold, const std::string &domain)

6.155.1 Detailed Description

A logger class. This class defines a **Logger** (p. 199) to which LogMessages can be sent.

Every **Logger** (p. 199) (except for the rootLogger) has a parent **Logger** (p. 199). The domain of a **Logger** (p. 199) (a string that indicates the origin of LogMessages) is composed by adding a subdomain to the domain of its parent **Logger** (p. 199).

A **Logger** (p. 199) also has a threshold. Every **LogMessage** (p. 203) that have a level that is greater than or equal to the threshold is forwarded to any **LogDestination** (p. 196) connected to this **Logger** (p. 199) as well as to the parent **Logger** (p. 199).

Typical usage of the **Logger** (p. 199) class is to declare a global **Logger** (p. 199) object for each library/module/component to be used by all classes and methods there.

6.155.2 Constructor & Destructor Documentation

6.155.2.1 Arc::Logger::Logger (**Logger** & *parent*, const std::string & *subdomain*)

Creates a logger.

Creates a logger. The threshold is inherited from its parent **Logger** (p. 199).

Parameters

parent The parent **Logger** (p. 199) of the new **Logger** (p. 199).

subdomain The subdomain of the new logger.

6.155.2.2 Arc::Logger::Logger (**Logger** & *parent*, const std::string & *subdomain*, **LogLevel** *threshold*)

Creates a logger.

Creates a logger.

Parameters

parent The parent **Logger** (p. 199) of the new **Logger** (p. 199).

subdomain The subdomain of the new logger.

threshold The threshold of the new logger.

6.155.2.3 Arc::Logger::~~Logger ()

Destroys a logger.

Destructor

6.155.3 Member Function Documentation

6.155.3.1 void Arc::Logger::addDestination (LogDestination & *destination*)

Adds a **LogDestination** (p. 196).

Adds a **LogDestination** (p. 196) to which to forward LogMessages sent to this logger (if they pass the threshold). Since LogDestinatoin should not be copied, the new **LogDestination** (p. 196) is passed by reference and a pointer to it is kept for later use. It is therefore important that the **LogDestination** (p. 196) passed to this **Logger** (p. 199) exists at least as long as the **Logger** (p. 199) itself.

6.155.3.2 void Arc::Logger::addDestinations (const std::list< LogDestination * > & *destinations*)

Adds LogDestinations.

See `addDestination(LogDestination& destination)` (p. 200).

6.155.3.3 const std::list<LogDestination*>& Arc::Logger::getDestinations (void) const

Obtains current LogDestinations.

Returns list of pointers to **LogDestination** (p. 196) objects. Returned result refers directly to internal member of **Logger** (p. 199) instance. Hence it should not be used after this **Logger** (p. 199) is destroyed.

6.155.3.4 static Logger& Arc::Logger::getRootLogger () [static]

The root **Logger** (p. 199).

This is the root **Logger** (p. 199). It is an ancestor of any other **Logger** (p. 199) and always exists.

6.155.3.5 LogLevel Arc::Logger::getThreshold () const

Returns the threshold.

Returns the threshold.

Returns

The threshold of this **Logger** (p. 199).

6.155.3.6 void Arc::Logger::msg (LogMessage *message*)

Sends a **LogMessage** (p. 203).

Sends a **LogMessage** (p. 203).

Parameters

The **LogMessage** (p. 203) to send.

Referenced by `msg()`, and `Arc::stringto()`.

6.155.3.7 void Arc::Logger::msg (LogLevel *level*, const std::string & *str*) [inline]

Logs a message text.

Logs a message text string at the specified LogLevel. This is a convenience method to save some typing. It simply creates a **LogMessage** (p. 203) and sends it to the other **msg()** (p. 201) method.

Parameters

level The level of the message.

str The message text.

References msg().

6.155.3.8 void Arc::Logger::setThreadContext (void)

Creates per-thread context.

Creates new context for this logger which becomes effective for operations initiated by this thread. All new threads started by this one will inherit new context. Context stores current threshold and pointers to destinations. Hence new context is identical to current one. One can modify new context using **setThreshold()** (p. 202), **removeDestinations()** (p. 199) and **addDestination()** (p. 200). All such operations will not affect old context.

6.155.3.9 void Arc::Logger::setThreshold (LogLevel *threshold*)

Sets the threshold.

This method sets the threshold of the **Logger** (p. 199). Any message sent to this **Logger** (p. 199) that has a level below this threshold will be discarded.

Parameters

The threshold

6.155.3.10 static void Arc::Logger::setThresholdForDomain (LogLevel *threshold*, const std::string & *domain*) [static]

Sets the threshold for domain.

This method sets the default threshold of the domain. All new loggers created with specified domain will have specified threshold set by default. The domain is composed of all subdomains of all loggers in chain by merging them with '.' as separator.

Parameters

threshold The threshold

domain The domain of logger

6.155.3.11 static void Arc::Logger::setThresholdForDomain (LogLevel *threshold*, const std::list< std::string > & *subdomains*) [static]

Sets the threshold for domain.

This method sets the default threshold of the domain. All new loggers created with specified domain will have specified threshold set by default. The subdomains of all loggers in chain are matched against list of provided subdomains.

Parameters

- threshold* The threshold
- subdomains* The subdomains of all loggers in chain

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

- Logger.h

6.156 Arc::LoggerContext Class Reference

Container for logger configuration.

```
#include <Logger.h>
```

6.156.1 Detailed Description

Container for logger configuration.

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

- Logger.h

6.157 Arc::LoggerFormat Struct Reference

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

- Logger.h

6.158 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)`

6.158.1 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.

6.158.2 Constructor & Destructor Documentation

6.158.2.1 `Arc::LogMessage::LogMessage (LogLevel level, const IString & message)`

Creates a **LogMessage** (p. 203) with the specified level and message text.

This constructor creates a **LogMessage** (p. 203) with the specified level and message text. The time is set automatically, the domain is set by the **Logger** (p. 199) to which the **LogMessage** (p. 203) 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. 203).

message The message text.

6.158.2.2 `Arc::LogMessage::LogMessage (LogLevel level, const IString & message, const std::string & identifier)`

Creates a **LogMessage** (p. 203) with the specified attributes.

This constructor creates a **LogMessage** (p. 203) with the specified level, message text and identifier. The time is set automatically and the domain is set by the **Logger** (p. 199) to which the **LogMessage** (p. 203) is sent.

Parameters

level The level of the **LogMessage** (p. 203).

message The message text.

ident The identifier of the **LogMessage** (p. 203).

6.158.3 Member Function Documentation

6.158.3.1 `LogLevel Arc::LogMessage::getLevel () const`

Returns the level of the **LogMessage** (p. 203).

Returns the level of the **LogMessage** (p. 203).

Returns

The level of the **LogMessage** (p. 203).

6.158.3.2 void Arc::LogMessage::setIdentifier (std::string *identifier*) [protected]

Sets the identifier of the **LogMessage** (p. 203).

The purpose of this method is to allow subclasses (in case there are any) to set the identifier of a **LogMessage** (p. 203).

Parameters

The identifier.

6.158.4 Friends And Related Function Documentation**6.158.4.1 friend class Logger [friend]**

The **Logger** (p. 199) class is a friend.

The **Logger** (p. 199) class must have some privileges (e.g. ability to call the setDomain() method), therefore it is a friend.

6.158.4.2 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:

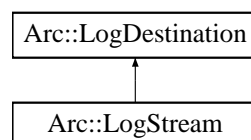
- Logger.h

6.159 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)

6.159.1 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. 205) object as long as the **Logger** (p. 199) to which it has been registered.

6.159.2 Constructor & Destructor Documentation

6.159.2.1 Arc::LogStream::LogStream (std::ostream & *destination*)

Creates a **LogStream** (p. 205) connected to an ostream.

Creates a **LogStream** (p. 205) connected to the specified ostream. In order not to break synchronization, it is important not to connect more than one **LogStream** (p. 205) object to a certain stream.

Parameters

destination The ostream to which to erite LogMessages.

6.159.2.2 Arc::LogStream::LogStream (std::ostream & *destination*, const std::string & *locale*)

Creates a **LogStream** (p. 205) connected to an ostream.

Creates a **LogStream** (p. 205) connected to the specified ostream. The output will be localised to the specified locale.

6.159.3 Member Function Documentation

6.159.3.1 virtual void Arc::LogStream::log (const LogMessage & *message*) [virtual]

Writes a **LogMessage** (p. 203) to the stream.

This method writes a **LogMessage** (p. 203) to the ostream that is connected to this **LogStream** (p. 205) object. It is synchronized so that not more than one **LogMessage** (p. 203) can be written at a time.

Parameters

message The **LogMessage** (p. 203) to write.

Implements **Arc::LogDestination** (p. 196).

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

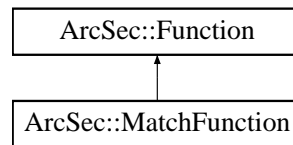
- Logger.h

6.160 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)

6.160.1 Detailed Description

Evaluate whether arg1 (value in regular expression) matched arg0 (table in regular expression).

6.160.2 Member Function Documentation

6.160.2.1 virtual **AttributeValue*** ArcSec::MatchFunction::evaluate (**AttributeValue** * *arg0*, **AttributeValue** * *arg1*, bool *check_id* = *true*) [virtual]

Evaluate two **AttributeValue** (p. 56) objects, and return one **AttributeValue** (p. 56) object

Implements **ArcSec::Function** (p. 167).

6.160.2.2 virtual std::list<**AttributeValue***> ArcSec::MatchFunction::evaluate (std::list< **AttributeValue** * > *args*, bool *check_id* = *true*) [virtual]

Evaluate a list of **AttributeValue** (p. 56) objects, and return a list of Attribute objects

Implements **ArcSec::Function** (p. 167).

6.160.2.3 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:

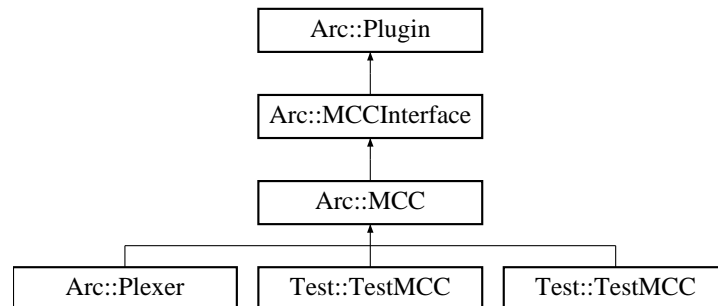
- MatchFunction.h

6.161 Arc::MCC Class Reference

Message (p. 216) Chain Component - base class for every **MCC** (p. 207) 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="") const

Protected Attributes

- std::map< std::string, **MCCInterface** * > **next_**
- std::map< std::string, std::list< **ArcSec::SecHandler** * > > **sechandlers_**

Static Protected Attributes

- static **Logger** **logger**

6.161.1 Detailed Description

Message (p. 216) Chain Component - base class for every **MCC** (p. 207) plugin. This is partially virtual class which defines interface and common functionality for every **MCC** (p. 207) plugin needed for managing of component in a chain.

6.161.2 Constructor & Destructor Documentation

6.161.2.1 Arc::MCC::MCC (Config *) [inline]

Example constructor - **MCC** (p. 207) takes at least it's configuration subtree

6.161.3 Member Function Documentation

6.161.3.1 virtual void Arc::MCC::AddSecHandler (Config * *cfg*, ArcSec::SecHandler * *sechandler*, const std::string & *label* = "") [virtual]

Add security components/handlers to this **MCC** (p. 207). 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. 207) 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. 207) 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.

6.161.3.2 virtual void Arc::MCC::Next (MCCInterface * *next*, const std::string & *label* = "") [virtual]

Add reference to next **MCC** (p. 207) in chain. This method is called by **Loader** (p. 195) for every potentially labeled link to next component which implements **MCCInterface** (p. 213). If next is NULL corresponding link is removed.

Reimplemented in **Arc::Plexer** (p. 254).

6.161.3.3 virtual MCC_Status Arc::MCC::process (Message &, Message &) [inline, virtual]

Dummy **Message** (p. 216) processing method. Just a placeholder.

Implements **Arc::MCCInterface** (p. 213).

Reimplemented in **Arc::Plexer** (p. 254).

6.161.3.4 bool Arc::MCC::ProcessSecHandlers (Message & *message*, const std::string & *label* = "") const [protected]

Executes security handlers of specified queue. Returns true if the message is authorized for further processing or if there are no security handlers which implement authorization functionality. This is a convenience method and has to be called by the implementation of the **MCC** (p. 207).

6.161.3.5 virtual void Arc::MCC::Unlink () [virtual]

Removing all links. Useful for destroying chains.

6.161.4 Field Documentation

6.161.4.1 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. 254).

6.161.4.2 std::map<std::string, MCCInterface *> Arc::MCC::next_ [protected]

Set of labeled "next" components. Each implemented **MCC** (p. 207) must call **process()** (p. 209) method of corresponding **MCCInterface** (p. 213) from this set in own **process()** (p. 209) method.

6.161.4.3 std::map<std::string, std::list<ArcSec::SecHandler *> > Arc::MCC::sechandlers_ [protected]

Set of labeled authentication and authorization handlers. **MCC** (p. 207) calls sequence of handlers at specific point depending on associated identifier. In most aces those are "in" and "out" for incoming and outgoing messages correspondingly.

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

- MCC.h

6.162 Arc::MCC_Status Class Reference

A class for communication of **MCC** (p. 207) 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

6.162.1 Detailed Description

A class for communication of **MCC** (p. 207) processing results. This class is used to communicate result status between MCCs. It contains a status kind, a string specifying the origin (**MCC** (p. 207)) of the status object and an explanation.

6.162.2 Constructor & Destructor Documentation

6.162.2.1 `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. 210) object.

Parameters

kind The StatusKind (default: STATUS_UNDEFINED)

origin The origin **MCC** (p. 207) (default: "??")

explanation An explanation (default: "No explanation.")

6.162.3 Member Function Documentation

6.162.3.1 `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.

6.162.3.2 `StatusKind Arc::MCC_Status::getKind () const`

Returns the status kind.

Returns the status kind of this object.

Returns

The status kind of this object.

6.162.3.3 `const std::string& Arc::MCC_Status::getOrigin () const`

Returns the origin.

This method returns a string specifying the origin **MCC** (p. 207) of this object.

Returns

A string specifying the origin **MCC** (p. 207) of this object.

6.162.3.4 `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!().

6.162.3.5 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().

6.162.3.6 Arc::MCC_Status::operator std::string () const

Conversion to string.

This operator converts a **MCC_Status** (p. 210) object to a string.

6.162.3.7 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

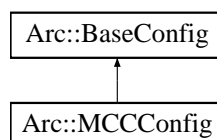
References isOk().

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

- MCC_Status.h

6.163 Arc::MCCConfig Class Reference

Inheritance diagram for Arc::MCCConfig:

**Public Member Functions**

- virtual **XMLNode MakeConfig** (XMLNode cfg) const

6.163.1 Member Function Documentation

6.163.1.1 virtual XMLNode Arc::MCCConfig::MakeConfig (XMLNode *cfg*) const [virtual]

Adds configuration part corresponding to stored information into common configuration tree supplied in 'cfg' argument. Returns reference to XML node representing configuration of **ModuleManager** (p. 224)

Reimplemented from **Arc::BaseConfig** (p. 60).

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

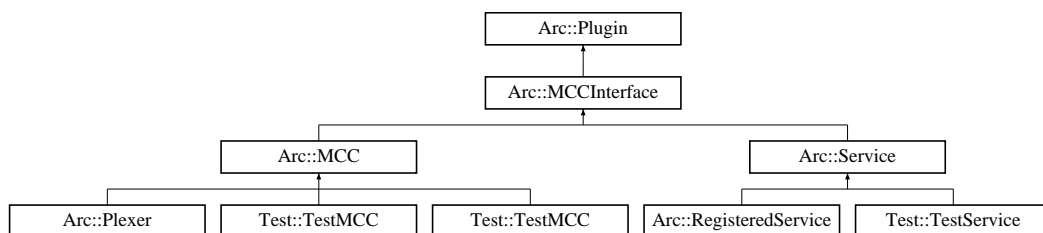
- MCC.h

6.164 Arc::MCCInterface Class Reference

Interface for communication between **MCC** (p. 207), **Service** (p. 288) and **Plexer** (p. 253) objects.

```
#include <MCC.h>
```

Inheritance diagram for Arc::MCCInterface:



Public Member Functions

- virtual **MCC_Status** process (Message &request, Message &response)=0

6.164.1 Detailed Description

Interface for communication between **MCC** (p. 207), **Service** (p. 288) and **Plexer** (p. 253) objects. The Interface consists of the method **process()** (p. 213) which is called by the previous **MCC** (p. 207) in the chain. For memory management policies please read the description of the **Message** (p. 216) class.

6.164.2 Member Function Documentation

6.164.2.1 virtual MCC_Status Arc::MCCInterface::process (Message & *request*, Message & *response*) [pure virtual]

Method for processing of requests and responses. This method is called by preceeding **MCC** (p. 207) in chain when a request needs to be processed. This method must call similar method of next **MCC** (p. 207) in chain unless any failure happens. Result returned by call to next **MCC** (p. 207) should be processed and passed back to previous **MCC** (p. 207). In case of failure this method is expected to generate valid error response and return it back to previous **MCC** (p. 207) without calling the next one.

Parameters

request The request that needs to be processed.

response A **Message** (p. 216) 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. 323), **Arc::MCC** (p. 209), and **Arc::Plexer** (p. 254).

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

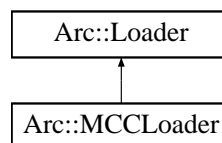
- MCC.h

6.165 Arc::MCCLoader Class Reference

Creator of **Message** (p. 216) Component Chains (**MCC** (p. 207)).

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

Inheritance diagram for Arc::MCCLoader:

**Public Member Functions**

- **MCCLoader** (**Config** &cfg)
- **~MCCLoader** ()
- **MCC * operator[]** (const std::string &id)

6.165.1 Detailed Description

Creator of **Message** (p. 216) Component Chains (**MCC** (p. 207)). 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. 207), **Service** (p. 288) and **Plexer** (p. 253). **MCC** (p. 207) and **Service** (p. 288) are loaded from dynamic libraries. For **Plexer** (p. 253) 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. 216) 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.

6.165.2 Constructor & Destructor Documentation

6.165.2.1 Arc::MCCLoader::MCCLoader (Config & *cfg*)

Constructor that takes whole XML configuration and creates component chains

6.165.2.2 Arc::MCCLoader::~~MCCLoader ()

Destructor destroys all components created by constructor

6.165.3 Member Function Documentation

6.165.3.1 MCC* Arc::MCCLoader::operator[] (const std::string & *id*)

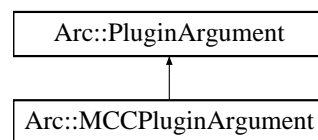
Access entry MCCs in chains. Those are components exposed for external access using 'entry' attribute

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

- MCCLoader.h

6.166 Arc::MCCPluginArgument Class Reference

Inheritance diagram for Arc::MCCPluginArgument:



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

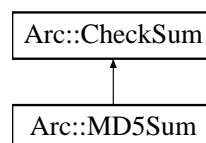
- MCC.h

6.167 Arc::MD5Sum Class Reference

Implementation of MD5 checksum.

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

Inheritance diagram for Arc::MD5Sum:



6.167.1 Detailed Description

Implementation of MD5 checksum.

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

- CheckSum.h

6.168 Arc::MemoryAllocationException Class Reference

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

- ByteArray.h

6.169 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)

6.169.1 Detailed Description

Object being passed through chain of MCCs. An instance of this class refers to objects with main content (**MessagePayload** (p. 224)), authentication/authorization information (**MessageAuth** (p. 221)) and common purpose attributes (**MessageAttributes** (p. 218)). **Message** (p. 216) class does not manage pointers to objects and their content. It only serves for grouping those objects. **Message** (p. 216) objects are supposed to be processed by MCCs and Services implementing **MCCInterface** (p. 213) method process(). All objects constituting content of **Message** (p. 216) 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. 216). b) Objects whose management is completely acquired by objects assigned to 'response' **Message** (p. 216).

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. 216) object).
4. It is allowed to change content of pointers of 'request' **Message** (p. 216). Calling process() method must not rely on that object to stay intact.
5. Called process() method should either fill 'response' **Message** (p. 216) with pointers to valid objects or to keep them intact. This makes it possible for calling process() to preload 'response' with valid error message.

6.169.2 Constructor & Destructor Documentation

6.169.2.1 Arc::Message::Message (void) [inline]

true if auth_ctx_ was created internally Dummy constructor

6.169.2.2 Arc::Message::Message (Message & msg) [inline]

Copy constructor. Ensures shallow copy.

6.169.2.3 Arc::Message::Message (long msg_ptr_addr)

Copy constructor. Used by language bindings

6.169.2.4 Arc::Message::~~Message (void) [inline]

Destructor does not affect referred objects except those created internally

6.169.3 Member Function Documentation

6.169.3.1 MessageAttributes* Arc::Message::Attributes (void) [inline]

Returns a pointer to the current attributes object or creates it if no attributes object has been assigned.

6.169.3.2 MessageAuth* Arc::Message::Auth (void) [inline]

Returns a pointer to the current authentication/authorization object or creates it if no object has been assigned.

6.169.3.3 MessageAuthContext* Arc::Message::AuthContext (void) [inline]

Returns a pointer to the current auth* context object or creates it if no object has been assigned.

6.169.3.4 void Arc::Message::AuthContext (MessageAuthContext * *auth_ctx*) [inline]

Assigns auth* context object

6.169.3.5 void Arc::Message::Context (MessageContext * *ctx*) [inline]

Assigns message context object

6.169.3.6 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.207) in a chain is connectionless like one implementing UDP protocol.

6.169.3.7 Message& Arc::Message::operator= (Message & *msg*) [inline]

Assignment. Ensures shallow copy.

6.169.3.8 MessagePayload* Arc::Message::Payload (void) [inline]

Returns pointer to current payload or NULL if no payload assigned.

6.169.3.9 MessagePayload* Arc::Message::Payload (MessagePayload * *payload*) [inline]

Replaces payload with new one. Returns the old one.

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

- Message.h

6.170 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_`

6.170.1 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. 216) Chain Component (**MCC** (p. 207)) 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. 207) 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. 207). 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. 207) and used by the plexer for routing the message to the appropriate service.

6.170.2 Constructor & Destructor Documentation

6.170.2.1 `Arc::MessageAttributes::MessageAttributes ()`

The default constructor.

This is the default constructor of the **MessageAttributes** (p. 218) class. It constructs an empty object that initially contains no attributes.

6.170.3 Member Function Documentation

6.170.3.1 `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.

6.170.3.2 `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.

6.170.3.3 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.

6.170.3.4 AttributeIterator Arc::MessageAttributes::getAll (const std::string & *key*) const

Access the value(s) of an attribute.

This method returns an **AttributeIterator** (p. 52) 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. 52) for access of the values of the attribute.

6.170.3.5 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.

6.170.3.6 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.

6.170.3.7 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.

6.170.4 Field Documentation**6.170.4.1 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:

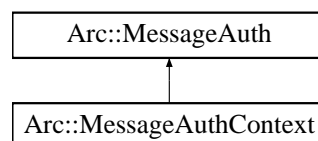
- MessageAttributes.h

6.171 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)

6.171.1 Detailed Description

Contains authenticity information, authorization tokens and decisions. This class only supports string keys and **SecAttr** (p. 283) values.

6.171.2 Member Function Documentation

6.171.2.1 `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. 222) tries to merge generated information to already existing like everything would be generated inside same **Export()** (p. 222) method. If does not represent valid node then new XML tree is created.

6.171.2.2 `MessageAuth* Arc::MessageAuth::Filter (const std::list< std::string > & selected_keys, const std::list< std::string > & rejected_keys)`

Creates new instance of **MessageAuth** (p. 221) 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:

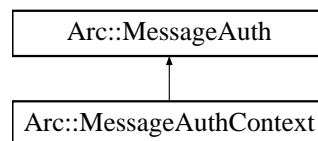
- MessageAuth.h

6.172 Arc::MessageAuthContext Class Reference

Handler for content of message auth* context.

```
#include <Message.h>
```

Inheritance diagram for Arc::MessageAuthContext:



6.172.1 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. 216) object usually by first **MCC** (p. 207) in a chain and is kept as long as connection persists.

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

- Message.h

6.173 Arc::MessageContext Class Reference

Handler for content of message context.

```
#include <Message.h>
```

Public Member Functions

- void **Add** (const std::string &name, **MessageContextElement** *element)

6.173.1 Detailed Description

Handler for content of message context. This class is a container for objects derived from **MessageContextElement** (p. 223). It gets associated with **Message** (p. 216) object usually by first **MCC** (p. 207) in a chain and is kept as long as connection persists.

6.173.2 Member Function Documentation

6.173.2.1 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:

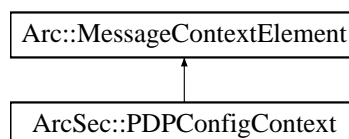
- Message.h

6.174 Arc::MessageContextElement Class Reference

Top class for elements contained in message context.

```
#include <Message.h>
```

Inheritance diagram for Arc::MessageContextElement:



6.174.1 Detailed Description

Top class for elements contained in message context. Objects of classes inherited with this one may be stored in **MessageContext** (p. 223) container.

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

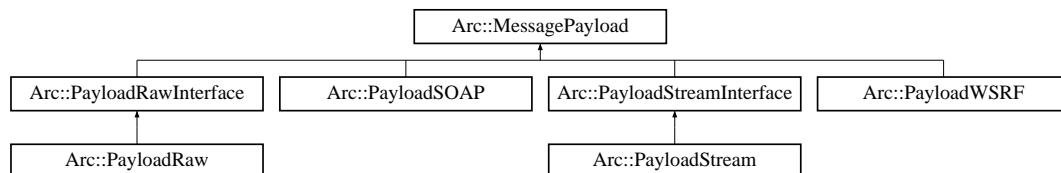
- Message.h

6.175 Arc::MessagePayload Class Reference

Base class for content of message passed through chain.

```
#include <Message.h>
```

Inheritance diagram for Arc::MessagePayload:



6.175.1 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

6.176 Arc::ModuleDesc Class Reference

Description of loadable module.

```
#include <Plugin.h>
```

6.176.1 Detailed Description

Description of loadable module. This class is used for reports

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

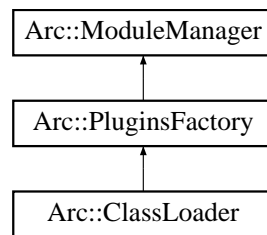
- Plugin.h

6.177 Arc::ModuleManager Class Reference

Manager of shared libraries.

```
#include <ModuleManager.h>
```

Inheritance diagram for Arc::ModuleManager:



Public Member Functions

- **ModuleManager** (**XMLNode** cfg)
- **Glib::Module *** **load** (const std::string &name, bool probe=false)
- std::string **find** (const std::string &name)
- **Glib::Module *** **reload** (**Glib::Module ***module)
- void **unload** (**Glib::Module ***module)
- void **unload** (const std::string &name)
- std::string **findLocation** (const std::string &name)
- bool **makePersistent** (**Glib::Module ***module)
- bool **makePersistent** (const std::string &name)
- void **setCfg** (**XMLNode** cfg)

6.177.1 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.

6.177.2 Constructor & Destructor Documentation

6.177.2.1 Arc::ModuleManager::ModuleManager (XMLNode cfg)

Cache of handles of loaded modules Constructor. It is supposed to process corresponding configuration subtree and tune module loading parameters accordingly.

6.177.3 Member Function Documentation

6.177.3.1 std::string Arc::ModuleManager::find (const std::string & name)

Finds loadable module by 'name' looking in same places as **load()** (p. 225) does, but does not load it.

6.177.3.2 std::string Arc::ModuleManager::findLocation (const std::string & name)

Finds shared library corresponding to module 'name' and returns path to it

6.177.3.3 Glib::Module* Arc::ModuleManager::load (const std::string & name, bool probe = false)

Finds module 'name' in cache or loads corresponding loadable module

6.177.3.4 `bool Arc::ModuleManager::makePersistent (const std::string & name)`

Make sure this module is never unloaded. Even if `unload()` (p. 226) is called.

6.177.3.5 `bool Arc::ModuleManager::makePersistent (Glib::Module * module)`

Make sure this module is never unloaded. Even if `unload()` (p. 226) is called.

6.177.3.6 `Glib::Module* Arc::ModuleManager::reload (Glib::Module * module)`

Reload module previously loaded in probe mode. New module is loaded with all symbols resolved and old module handler is unloaded. In case of error old module is not unloaded.

6.177.3.7 `void Arc::ModuleManager::setCfg (XMLNode cfg)`

Input the configuration subtree, and trigger the module loading (do almost the same as the Constructor); It is function desgined for **ClassLoader** (p. 68) to adopt the singleton pattern

6.177.3.8 `void Arc::ModuleManager::unload (const std::string & name)`

Unload module by its name

6.177.3.9 `void Arc::ModuleManager::unload (Glib::Module * module)`

Unload module by its identifier

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

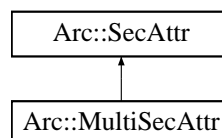
- ModuleManager.h

6.178 Arc::MultiSecAttr Class Reference

Container of multiple **SecAttr** (p. 283) attributes.

```
#include <SecAttr.h>
```

Inheritance diagram for Arc::MultiSecAttr:



Public Member Functions

- virtual **operator bool** () const
- virtual bool **Export** (SecAttrFormat format, XMLNode &val) const

6.178.1 Detailed Description

Container of multiple **SecAttr** (p. 283) 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.

6.178.2 Member Function Documentation

6.178.2.1 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. 284).

6.178.2.2 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. 284).

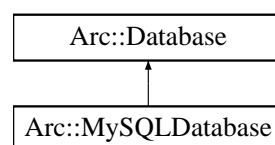
The documentation for this class was generated from the following file:

- SecAttr.h

6.179 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** ()

6.179.1 Detailed Description

Implement the database accessing interface in **DBInterface.h** (p. ??) by using mysql client library for accessing mysql database

6.179.2 Member Function Documentation

6.179.2.1 virtual void Arc::MySQLDatabase::close () [virtual]

Close the connection with database server

Implements **Arc::Database** (p. 99).

6.179.2.2 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. 99).

6.179.2.3 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. 99).

6.179.2.4 virtual bool Arc::MySQLDatabase::isconnected () const [inline, virtual]

Get the connection status

Implements **Arc::Database** (p. 99).

6.179.2.5 virtual bool Arc::MySQLDatabase::shutdown () [virtual]

Ask database server to shutdown

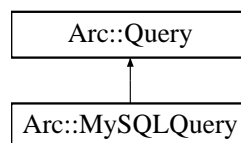
Implements **Arc::Database** (p. 99).

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

- MysqlWrapper.h

6.180 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)

6.180.1 Member Function Documentation

6.180.1.1 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. 266).

6.180.1.2 virtual bool Arc::MySQLQuery::get_array (std::string & *sqlstr*, QueryArrayResult & *result*, std::vector< std::string > & *arguments*) [virtual]

Query (p. 265) 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. 266).

6.180.1.3 virtual int Arc::MySQLQuery::get_num_columns () [virtual]

Get the column number in the query result

Implements **Arc::Query** (p. 266).

6.180.1.4 virtual int Arc::MySQLQuery::get_num_rows () [virtual]

Get the row number in the query result

Implements **Arc::Query** (p. 266).

6.180.1.5 virtual QueryRowResult Arc::MySQLQuery::get_row (int *row_number*) const [virtual]

Get the value of one row in the query result

Parameters

row_number The number of the row

Returns

A vector includes all the values in the row

Implements **Arc::Query** (p. 267).

6.180.1.6 virtual QueryRowResult Arc::MySQLQuery::get_row () const [virtual]

Get the value of one row in the query result, the row number will be automatically increased each time the method is called

Implements **Arc::Query** (p. 267).

6.180.1.7 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 field in the specified row

Implements **Arc::Query** (p. 267).

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

- MysqlWrapper.h

6.181 Arc::NotificationType Class Reference

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

- JobDescription.h

6.182 Arc::NS Class Reference

Public Member Functions

- **NS** (void)
- **NS** (const char *prefix, const char *uri)
- **NS** (const char *nslist[][2])

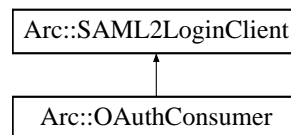
The documentation for this class was generated from the following file:

- XMLNode.h

6.183 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="")

6.183.1 Detailed Description

The OAuth functionality depends on the availability of the liboauth C-bindings library

6.183.2 Constructor & Destructor Documentation

6.183.2.1 Arc::OAuthConsumer::OAuthConsumer (const MCCCConfig *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.

6.183.3 Member Function Documentation

6.183.3.1 MCC_Status Arc::OAuthConsumer::approveCSR (const std::string *approve_page*) [virtual]

Unsupported placeholder function until Confusa supports OAuth.

Implements Arc::SAML2LoginClient (p. 277).

6.183.3.2 MCC_Status Arc::OAuthConsumer::parseDN (std::string * *dn*) [virtual]

Unsupported placeholder function until Confusa supports OAuth.

Implements Arc::SAML2LoginClient (p. 277).

6.183.3.3 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. 278).

6.183.3.4 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. 277).

6.183.3.5 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.

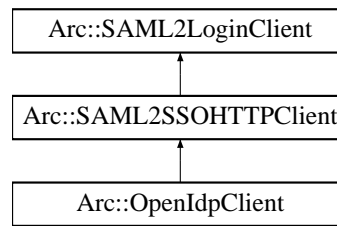
Implements Arc::SAML2LoginClient (p. 277).

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

- OAuthConsumer.h

6.184 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** ()

6.184.1 Member Function Documentation

6.184.1.1 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. 279).

6.184.1.2 MCC_Status Arc::OpenIdpClient::processIdP2Confusa () [protected, virtual]

Redirects the user back from identity provider to the Confusa SP

Implements **Arc::SAML2SSOHTTPClient** (p. 279).

6.184.1.3 MCC_Status Arc::OpenIdpClient::processIdPLogin (const std::string *username*, const std::string *password*) [protected, virtual]

Actual identity provider parsers for next three methods implemented in subdirectory idp/

Parse identity provider login page and submit username and password in the previsioned way

Implements **Arc::SAML2SSOHTTPClient** (p. 279).

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

- OpenIdpClient.h

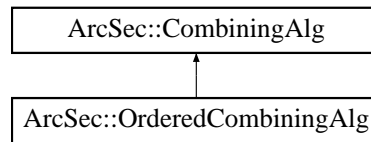
6.185 Arc::OptionParser Class Reference

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

- OptionParser.h

6.186 ArcSec::OrderedCombiningAlg Class Reference

Inheritance diagram for ArcSec::OrderedCombiningAlg:



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

- OrderedAlg.h

6.187 passwd Struct Reference

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

- win32.h

6.188 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

6.188.1 Detailed Description

Class to iterate through elements of path.

6.188.2 Constructor & Destructor Documentation

6.188.2.1 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.

6.188.3 Member Function Documentation

6.188.3.1 Arc::PathIterator::operator bool () const

Return false when iterator moved outside path elements

6.188.3.2 std::string Arc::PathIterator::operator* () const

Returns part of initial path from first till and including current

6.188.3.3 PathIterator& Arc::PathIterator::operator++ ()

Advances iterator to point at next path element

6.188.3.4 PathIterator& Arc::PathIterator::operator-- ()

Moves iterator to element before current

6.188.3.5 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:

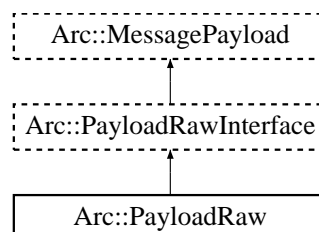
- URL.h

6.189 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)

6.189.1 Detailed Description

Raw byte multi-buffer. This is implementation of **PayloadRawInterface** (p.238). Buffers are memory blocks logically placed one after another.

6.189.2 Constructor & Destructor Documentation

6.189.2.1 `Arc::PayloadRaw::PayloadRaw (void) [inline]`

List of handled buffers. Constructor. Created object contains no buffers.

6.189.2.2 `virtual Arc::PayloadRaw::~~PayloadRaw (void) [virtual]`

Destructor. Frees allocated buffers.

6.189.3 Member Function Documentation

6.189.3.1 `virtual char* Arc::PayloadRaw::Buffer (unsigned int num = 0) [virtual]`

Returns pointer to num'th buffer

Implements **Arc::PayloadRawInterface** (p.239).

6.189.3.2 `virtual Size_t Arc::PayloadRaw::BufferPos (unsigned int num = 0) const [virtual]`

Returns position of num'th buffer

Implements **Arc::PayloadRawInterface** (p.239).

6.189.3.3 `virtual Size_t Arc::PayloadRaw::BufferSize (unsigned int num = 0) const [virtual]`

Returns length of num'th buffer

Implements **Arc::PayloadRawInterface** (p.239).

6.189.3.4 `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. 239).

6.189.3.5 **virtual char* Arc::PayloadRaw::Insert (Size_t pos = 0, Size_t size = 0) [virtual]**

Create new buffer at global position 'pos' of size 'size'.

Implements **Arc::PayloadRawInterface** (p. 239).

6.189.3.6 **virtual char* Arc::PayloadRaw::Insert (const char * s, Size_t pos = 0, Size_t size = -1) [virtual]**

Create new buffer at global position 'pos' of size 'size'. Created buffer is filled with content of memory at 's'. If 'size' is negative content at 's' is expected to be null-terminated.

Implements **Arc::PayloadRawInterface** (p. 239).

6.189.3.7 **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. 240).

6.189.3.8 **virtual Size_t Arc::PayloadRaw::Size (void) const [virtual]**

Returns logical size of whole structure.

Implements **Arc::PayloadRawInterface** (p. 240).

6.189.3.9 **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. 240).

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

- PayloadRaw.h

6.190 Arc::PayloadRawBuf Struct Reference

Data Fields

- int **size**
- int **length**
- bool **allocated**

6.190.1 Field Documentation

6.190.1.1 `bool Arc::PayloadRawBuf::allocated`

size of used memory - size of buffer

6.190.1.2 `int Arc::PayloadRawBuf::length`

size of allocated memory

6.190.1.3 `int Arc::PayloadRawBuf::size`

pointer to buffer in memory

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

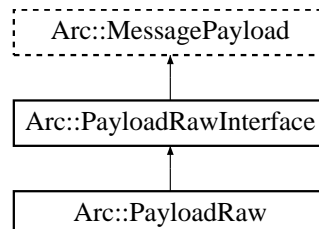
- PayloadRaw.h

6.191 `Arc::PayloadRawInterface` Class Reference

Random Access Payload for **Message** (p. 216) 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

6.191.1 Detailed Description

Random Access Payload for **Message** (p. 216) objects. This class is a virtual interface for managing **Message** (p. 216) 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.

6.191.2 Member Function Documentation

6.191.2.1 `virtual char* Arc::PayloadRawInterface::Buffer (unsigned int num) [pure virtual]`

Returns pointer to num'th buffer

Implemented in **Arc::PayloadRaw** (p. 236).

6.191.2.2 `virtual Size_t Arc::PayloadRawInterface::BufferPos (unsigned int num) const [pure virtual]`

Returns position of num'th buffer

Implemented in **Arc::PayloadRaw** (p. 236).

6.191.2.3 `virtual Size_t Arc::PayloadRawInterface::BufferSize (unsigned int num) const [pure virtual]`

Returns length of num'th buffer

Implemented in **Arc::PayloadRaw** (p. 236).

6.191.2.4 `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. 236).

6.191.2.5 `virtual char* Arc::PayloadRawInterface::Insert (Size_t pos = 0, Size_t size = 0) [pure virtual]`

Create new buffer at global position 'pos' of size 'size'.

Implemented in **Arc::PayloadRaw** (p. 237).

6.191.2.6 `virtual char* Arc::PayloadRawInterface::Insert (const char * s, Size_t pos = 0, Size_t size = -1) [pure virtual]`

Create new buffer at global position 'pos' of size 'size'. Created buffer is filled with content of memory at 's'. If 'size' is negative content at 's' is expected to be null-terminated.

Implemented in **Arc::PayloadRaw** (p. 237).

6.191.2.7 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. 237).

6.191.2.8 virtual Size_t Arc::PayloadRawInterface::Size (void) const [pure virtual]

Returns logical size of whole structure.

Implemented in **Arc::PayloadRaw** (p. 237).

6.191.2.9 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. 237).

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

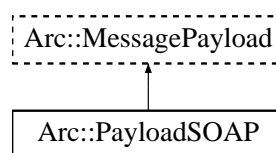
- PayloadRaw.h

6.192 Arc::PayloadSOAP Class Reference

Payload of **Message** (p. 216) 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)

6.192.1 Detailed Description

Payload of **Message** (p. 216) with SOAP content. This class combines **MessagePayload** (p. 224) with SOAPEnvelope to make it possible to pass SOAP messages through **MCC** (p. 207) chain.

6.192.2 Constructor & Destructor Documentation

6.192.2.1 Arc::PayloadSOAP::PayloadSOAP (const NS & ns, bool fault = false)

Constructor - creates new **Message** (p. 216) payload

6.192.2.2 Arc::PayloadSOAP::PayloadSOAP (const SOAPEnvelope & soap)

Constructor - creates **Message** (p. 216) payload from SOAP document. Provided SOAP document is copied to new object.

6.192.2.3 Arc::PayloadSOAP::PayloadSOAP (const MessagePayload & source)

Constructor - creates SOAP message from payload. **PayloadRawInterface** (p. 238) and derived classes are supported.

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

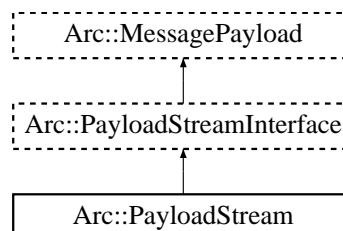
- PayloadSOAP.h

6.193 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
- virtual Size_t **Limit** (void) const

Protected Attributes

- int **handle_**
- bool **seekable_**

6.193.1 Detailed Description

POSIX handle as Payload. This is an implemetation of **PayloadStreamInterface** (p.244) for generic POSIX handle.

6.193.2 Constructor & Destructor Documentation

6.193.2.1 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.

6.193.2.2 virtual Arc::PayloadStream::~~PayloadStream (void) [inline, virtual]

Destructor.

6.193.3 Member Function Documentation

6.193.3.1 virtual bool Arc::PayloadStream::Get (char * *buf*, int & *size*) [virtual]

Extracts information from stream up to 'size' bytes. 'size' contains number of read bytes on exit. Returns true in case of success.

Implements **Arc::PayloadStreamInterface** (p.245).

6.193.3.2 virtual bool Arc::PayloadStream::Get (std::string & *buf*) [virtual]

Read as many as possible (sane amount) of bytes into buf.

Implements **Arc::PayloadStreamInterface** (p.245).

6.193.3.3 virtual std::string Arc::PayloadStream::Get (void) [inline, virtual]

Read as many as possible (sane amount) of bytes.

Implements **Arc::PayloadStreamInterface** (p.245).

References Get().

Referenced by Get().

6.193.3.4 virtual Size_t Arc::PayloadStream::Limit (void) const [inline, virtual]

Returns position at which stream reading will stop if supported. That may be not same as **Size()** (p. 244) if instance is meant to provide access to only part of underlying object.

Implements **Arc::PayloadStreamInterface** (p. 245).

6.193.3.5 virtual Arc::PayloadStream::operator bool (void) [inline, virtual]

Returns true if stream is valid.

Implements **Arc::PayloadStreamInterface** (p. 246).

References `handle_`.

6.193.3.6 virtual bool Arc::PayloadStream::operator! (void) [inline, virtual]

Returns true if stream is invalid.

Implements **Arc::PayloadStreamInterface** (p. 246).

References `handle_`.

6.193.3.7 virtual Size_t Arc::PayloadStream::Pos (void) const [inline, virtual]

Returns current position in stream if supported.

Implements **Arc::PayloadStreamInterface** (p. 246).

6.193.3.8 virtual bool Arc::PayloadStream::Put (const char * buf, Size_t size) [virtual]

Push 'size' bytes from 'buf' into stream. Returns true on success.

Implements **Arc::PayloadStreamInterface** (p. 246).

6.193.3.9 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. 246).

References `Put()`.

Referenced by `Put()`.

6.193.3.10 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. 246).

References `Put()`.

Referenced by `Put()`.

6.193.3.11 `virtual Size_t Arc::PayloadStream::Size (void) const [inline, virtual]`

Returns size of underlying object if supported.

Implements `Arc::PayloadStreamInterface` (p. 246).

6.193.3.12 `virtual int Arc::PayloadStream::Timeout (void) const [inline, virtual]`

Query (p. 265) current timeout for `Get()` (p. 242) and `Put()` (p. 243) operations.

Implements `Arc::PayloadStreamInterface` (p. 246).

6.193.3.13 `virtual void Arc::PayloadStream::Timeout (int to) [inline, virtual]`

Set current timeout for `Get()` (p. 242) and `Put()` (p. 243) operations.

Implements `Arc::PayloadStreamInterface` (p. 247).

6.193.4 Field Documentation

6.193.4.1 `int Arc::PayloadStream::handle_ [protected]`

Timeout for read/write operations

Referenced by operator `bool()`, and operator `!()`.

6.193.4.2 `bool Arc::PayloadStream::seekable_ [protected]`

Handle for operations

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

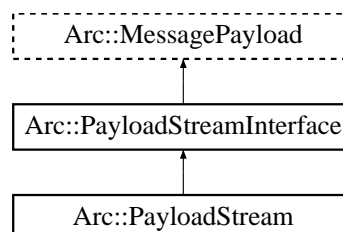
- `PayloadStream.h`

6.194 `Arc::PayloadStreamInterface` Class Reference

Stream-like Payload for `Message` (p. 216) 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
- virtual Size_t **Limit** (void) const =0

6.194.1 Detailed Description

Stream-like Payload for **Message** (p. 216) object. This class is a virtual interface for managing stream-like source and destination. It's supposed to be passed through **MCC** (p. 207) chain as payload of **Message** (p. 216). It must be treated by MCCs and Services as dynamic payload. This class is purely virtual.

6.194.2 Member Function Documentation

6.194.2.1 virtual bool Arc::PayloadStreamInterface::Get (char * *buf*, int & *size*) [pure virtual]

Extracts information from stream up to 'size' bytes. 'size' contains number of read bytes on exit. Returns true in case of success.

Implemented in **Arc::PayloadStream** (p. 242).

6.194.2.2 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. 242).

6.194.2.3 virtual std::string Arc::PayloadStreamInterface::Get (void) [pure virtual]

Read as many as possible (sane amount) of bytes.

Implemented in **Arc::PayloadStream** (p. 242).

6.194.2.4 virtual Size_t Arc::PayloadStreamInterface::Limit (void) const [pure virtual]

Returns position at which stream reading will stop if supported. That may be not same as **Size()** (p. 246) if instance is meant to provide access to only part of underlying object.

Implemented in **Arc::PayloadStream** (p. 243).

6.194.2.5 virtual Arc::PayloadStreamInterface::operator bool (void) [pure virtual]

Returns true if stream is valid.

Implemented in **Arc::PayloadStream** (p. 243).

6.194.2.6 virtual bool Arc::PayloadStreamInterface::operator! (void) [pure virtual]

Returns true if stream is invalid.

Implemented in **Arc::PayloadStream** (p. 243).

6.194.2.7 virtual Size_t Arc::PayloadStreamInterface::Pos (void) const [pure virtual]

Returns current position in stream if supported.

Implemented in **Arc::PayloadStream** (p. 243).

6.194.2.8 virtual bool Arc::PayloadStreamInterface::Put (const char * buf, Size_t size) [pure virtual]

Push 'size' bytes from 'buf' into stream. Returns true on success.

Implemented in **Arc::PayloadStream** (p. 243).

6.194.2.9 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. 243).

6.194.2.10 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. 243).

6.194.2.11 virtual Size_t Arc::PayloadStreamInterface::Size (void) const [pure virtual]

Returns size of underlying object if supported.

Implemented in **Arc::PayloadStream** (p. 244).

6.194.2.12 virtual int Arc::PayloadStreamInterface::Timeout (void) const [pure virtual]

Query (p. 265) current timeout for **Get()** (p. 245) and **Put()** (p. 246) operations.

Implemented in **Arc::PayloadStream** (p. 244).

6.194.2.13 virtual void Arc::PayloadStreamInterface::Timeout (int *to*) [pure virtual]

Set current timeout for **Get()** (p. 245) and **Put()** (p. 246) operations.

Implemented in **Arc::PayloadStream** (p. 244).

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

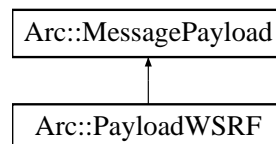
- PayloadStream.h

6.195 Arc::PayloadWSRF Class Reference

This class combines **MessagePayload** (p. 224) with **WSRF** (p. 376).

```
#include <PayloadWSRF.h>
```

Inheritance diagram for Arc::PayloadWSRF:



Public Member Functions

- **PayloadWSRF** (const SOAPEnvelope &soap)
- **PayloadWSRF** (WSRF &wsrp)
- **PayloadWSRF** (const **MessagePayload** &source)

6.195.1 Detailed Description

This class combines **MessagePayload** (p. 224) with **WSRF** (p. 376). It's intention is to make it possible to pass **WSRF** (p. 376) messages through **MCC** (p. 207) chain as one more Payload type.

6.195.2 Constructor & Destructor Documentation

6.195.2.1 Arc::PayloadWSRF::PayloadWSRF (const SOAPEnvelope & *soap*)

Constructor - creates **Message** (p. 216) payload from SOAP message. Returns invalid **WSRF** (p. 376) if SOAP does not represent WS-ResourceProperties

6.195.2.2 Arc::PayloadWSRF::PayloadWSRF (WSRF & *wsrp*)

Constructor - creates **Message** (p. 216) payload with acquired **WSRF** (p. 376) message. **WSRF** (p. 376) message will be destroyed by destructor of this object.

6.195.2.3 Arc::PayloadWSRF::PayloadWSRF (const MessagePayload & source)

Constructor - creates **WSRF** (p. 376) message from payload. All classes derived from SOAPEnvelope are supported.

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

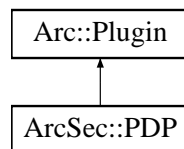
- PayloadWSRF.h

6.196 ArcSec::PDP Class Reference

Base class for **Policy** (p. 260) Decision Point plugins.

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

Inheritance diagram for ArcSec::PDP:



6.196.1 Detailed Description

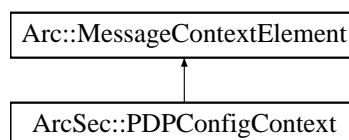
Base class for **Policy** (p. 260) Decision Point plugins. This virtual class defines method isPermitted() which processes security related information/attributes in Message and makes security decision - permit (true) or deny (false). Configuration of **PDP** (p. 248) is consumed during creation of instance through XML subtree fed to constructor.

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

- PDP.h

6.197 ArcSec::PDPCfgContext Class Reference

Inheritance diagram for ArcSec::PDPCfgContext:

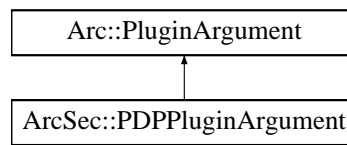


The documentation for this class was generated from the following file:

- PDP.h

6.198 ArcSec::PDPPluginArgument Class Reference

Inheritance diagram for ArcSec::PDPPluginArgument:



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

- PDP.h

6.199 Arc::Period Class Reference

Public Member Functions

- **Period** ()
- **Period** (time_t)
- **Period** (time_t seconds, uint32_t nanoseconds)
- **Period** (const std::string &, PeriodBase base=PeriodSeconds)
- **Period** & **operator=** (time_t)
- **Period** & **operator=** (const **Period** &)
- void **SetPeriod** (time_t)
- time_t **GetPeriod** () const
- const sigc::slot< const char * > * **istr** () const
- **operator std::string** () const
- bool **operator<** (const **Period** &) const
- bool **operator>** (const **Period** &) const
- bool **operator<=** (const **Period** &) const
- bool **operator>=** (const **Period** &) const
- bool **operator==** (const **Period** &) const
- bool **operator!=** (const **Period** &) const

6.199.1 Constructor & Destructor Documentation

6.199.1.1 Arc::Period::Period ()

Default constructor. The period is set to 0 length.

6.199.1.2 Arc::Period::Period (time_t)

Constructor that takes a time_t variable and stores it.

6.199.1.3 Arc::Period::Period (time_t seconds, uint32_t nanoseconds)

Constructor that takes seconds and nanoseconds and stores them.

6.199.1.4 Arc::Period::Period (const std::string & , PeriodBase *base* = *PeriodSeconds*)

Constructor that tries to convert a string.

6.199.2 Member Function Documentation**6.199.2.1 time_t Arc::Period::GetPeriod () const**

gets the period

6.199.2.2 const sigc::slot<const char*>* Arc::Period::istr () const

For use with **IString** (p. 184)

6.199.2.3 Arc::Period::operator std::string () const

Returns a string representation of the period.

6.199.2.4 bool Arc::Period::operator!= (const Period &) const

Comparing two **Period** (p. 249) objects.

6.199.2.5 bool Arc::Period::operator< (const Period &) const

Comparing two **Period** (p. 249) objects.

6.199.2.6 bool Arc::Period::operator<= (const Period &) const

Comparing two **Period** (p. 249) objects.

6.199.2.7 Period& Arc::Period::operator= (time_t)

Assignment operator from a time_t.

6.199.2.8 Period& Arc::Period::operator= (const Period &)

Assignment operator from a **Period** (p. 249).

6.199.2.9 bool Arc::Period::operator== (const Period &) const

Comparing two **Period** (p. 249) objects.

6.199.2.10 bool Arc::Period::operator> (const Period &) const

Comparing two **Period** (p. 249) objects.

6.199.2.11 bool ArcSec::Period::operator>= (const Period &) const

Comparing two **Period** (p. 249) objects.

6.199.2.12 void ArcSec::Period::SetPeriod (time_t)

sets the period

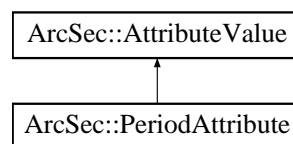
The documentation for this class was generated from the following file:

- DateTime.h

6.200 ArcSec::PeriodAttribute Class Reference

```
#include <DateTimeAttribute.h>
```

Inheritance diagram for ArcSec::PeriodAttribute:

**Public Member Functions**

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

6.200.1 Detailed Description

Formate: datetime"/"duration datetime"/"datetime duration"/"datetime

6.200.2 Member Function Documentation**6.200.2.1 virtual std::string ArcSec::PeriodAttribute::encode () [virtual]**

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 57).

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

Evaluate whether "this" equale to the parameter value

Implements **ArcSec::AttributeValue** (p. 57).

6.200.2.3 virtual std::string ArcSec::PeriodAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

6.200.2.4 virtual std::string ArcSec::PeriodAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

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

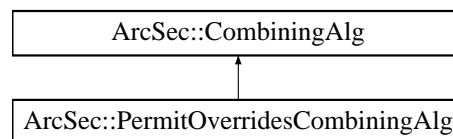
- DateTimeAttribute.h

6.201 ArcSec::PermitOverridesCombiningAlg Class Reference

Implement the "Permit-Overrides" algorithm.

```
#include <PermitOverridesAlg.h>
```

Inheritance diagram for ArcSec::PermitOverridesCombiningAlg:



Public Member Functions

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

6.201.1 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".

6.201.2 Member Function Documentation

6.201.2.1 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. 75).

6.201.2.2 `virtual const std::string& ArcSec::PermitOverridesCombiningAlg::getalgId (void)
const [inline, virtual]`

Get the identifier

Implements **ArcSec::CombiningAlg** (p. 75).

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

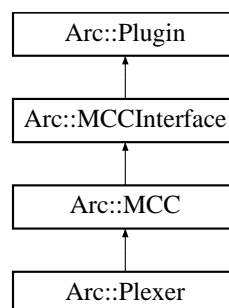
- PermitOverridesAlg.h

6.202 Arc::Plexer Class Reference

The **Plexer** (p. 253) 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

6.202.1 Detailed Description

The **Plexer** (p. 253) class, used for routing messages to services. This is the **Plexer** (p. 253) class. Its purpose is to route incoming messages to appropriate Services and **MCC** (p. 207) chains.

6.202.2 Constructor & Destructor Documentation

6.202.2.1 **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.

6.202.2.2 **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.

6.202.3 Member Function Documentation

6.202.3.1 **virtual void Arc::Plexer::Next** (**MCCInterface** * *next*, **const std::string &** *label*) [**virtual**]

Add reference to next **MCC** (p. 207) in chain.

This method is called by **Loader** (p. 195) for every potentially labeled link to next component which implements **MCCInterface** (p. 213). If next is set NULL corresponding link is removed.

Reimplemented from **Arc::MCC** (p. 209).

6.202.3.2 **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. 209).

6.202.4 Field Documentation

6.202.4.1 **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. 209).

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

- Plexer.h

6.203 Arc::PlexerEntry Class Reference

A pair of label (regex) and pointer to **MCC** (p. 207).

```
#include <Plexer.h>
```

6.203.1 Detailed Description

A pair of label (regex) and pointer to **MCC** (p. 207). 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:

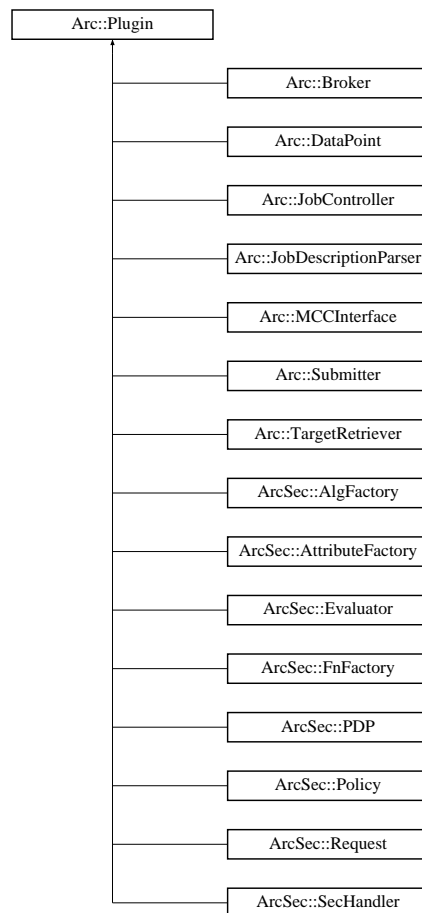
- Plexer.h

6.204 Arc::Plugin Class Reference

Base class for loadable ARC components.

```
#include <Plugin.h>
```

Inheritance diagram for Arc::Plugin:



6.204.1 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:

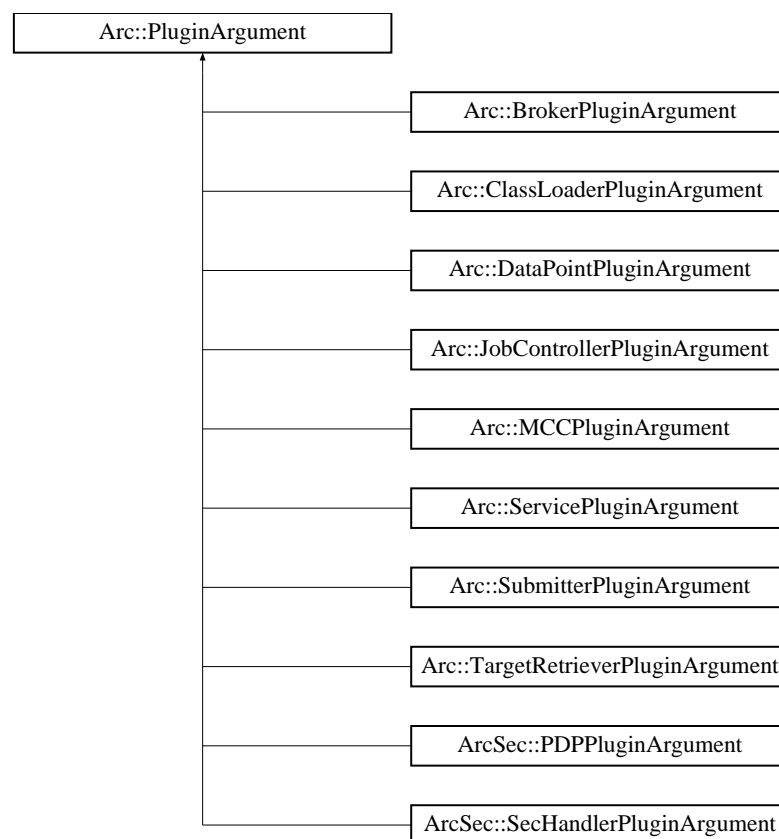
- Plugin.h

6.205 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)

6.205.1 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.

6.205.2 Member Function Documentation

6.205.2.1 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.

6.205.2.2 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

6.206 Arc::PluginDesc Class Reference

Description of plugin.

```
#include <Plugin.h>
```

6.206.1 Detailed Description

Description of plugin. This class is used for reports

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

- Plugin.h

6.207 Arc::PluginDescriptor Struct Reference

Description of ARC lodable component.

```
#include <Plugin.h>
```

6.207.1 Detailed Description

Description of ARC lodable component.

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

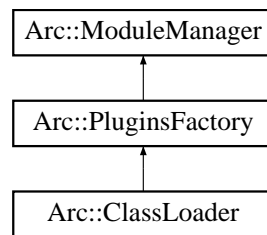
- Plugin.h

6.208 Arc::PluginsFactory Class Reference

Generic ARC plugins loader.

```
#include <Plugin.h>
```

Inheritance diagram for Arc::PluginsFactory:



Public Member Functions

- **PluginsFactory** (XMLNode cfg)
- void **TryLoad** (bool v=true)
- bool **load** (const std::string &name)
- bool **scan** (const std::string &name, **ModuleDesc** &desc)
- void **report** (std::list< **ModuleDesc** > &descs)

Static Public Member Functions

- static void **FilterByKind** (const std::string &kind, std::list< **ModuleDesc** > &descs)

6.208.1 Detailed Description

Generic ARC plugins loader. The instance of this class provides functionality of loading pluggable ARC components stored in shared libraries. For more information please check HED documentation. This class is thread-safe - its methods are protected from simultaneous use from multiple threads. Current thread protection implementation is suboptimal and will be revised in future.

6.208.2 Constructor & Destructor Documentation

6.208.2.1 Arc::PluginsFactory::PluginsFactory (XMLNode *cfg*)

Constructor - accepts configuration (not yet used) meant to tune loading of modules.

6.208.3 Member Function Documentation

6.208.3.1 static void Arc::PluginsFactory::FilterByKind (const std::string & *kind*, std::list< **ModuleDesc** > & *descs*) [static]

Filter list of modules by kind.

6.208.3.2 bool Arc::PluginsFactory::load (const std::string & *name*)

These methods load module named lib'name' and check if it contains ARC plugin(s) of specified 'kind' and 'name'. If there are no specified plugins or module does not contain any ARC plugins it is unloaded. All loaded plugins are also registered in internal list of this instance of **PluginsFactory** (p. 258) class. Returns true if any plugin was loaded.

6.208.3.3 void Arc::PluginsFactory::report (std::list< ModuleDesc > & desc)

Provides information about currently loaded modules and plugins.

6.208.3.4 bool Arc::PluginsFactory::scan (const std::string & name, ModuleDesc & desc)

Collect information about plugins stored in module(s) with specified names. Returns true if any of specified modules has plugins.

6.208.3.5 void Arc::PluginsFactory::TryLoad (bool v = true) [inline]

These methods load module named lib'name', locate plugin constructor functions of specified 'kind' and 'name' (if specified) and call it. Supplied argument affects way plugin instance is created in plugin-specific way. If name of plugin is not specified then all plugins of specified kind are tried with supplied argument till valid instance is created. All loaded plugins are also registered in internal list of this instance of **PluginsFactory** (p. 258) class. If search is set to false then no attempt is made to find plugins in loadable modules. Only plugins already loaded with previous calls to get_instance() and load() are checked. Returns created instance or NULL if failed. Specifies if loadable module may be loaded while looking for analyzing its content. If set to false only *.apd files are checked. Modules without corresponding *.apd will be ignored. Default is true;

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

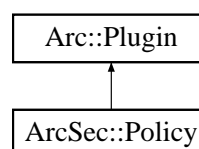
- Plugin.h

6.209 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

6.209.1 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.

6.209.2 Constructor & Destructor Documentation

6.209.2.1 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.

6.209.2.2 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. 152) which includes the factory objects for combining algorithm and function

6.209.3 Member Function Documentation

6.209.3.1 virtual void ArcSec::Policy::addPolicy (Policy * pl) [inline, virtual]

Add a policy element into "this" object

6.209.3.2 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>

6.209.3.3 virtual std::string ArcSec::Policy::getEffect () const [pure virtual]

Get the "Effect" attribute

6.209.3.4 `virtual const char* ArcSec::Policy::getEvalName () const [pure virtual]`

Get the name of **Evaluator** (p. 149) which can evaluate this policy

6.209.3.5 `virtual EvalResult& ArcSec::Policy::getEvalResult () [pure virtual]`

Get evaluation result

6.209.3.6 `virtual const char* ArcSec::Policy::getName () const [pure virtual]`

Get the name of this policy

6.209.3.7 `virtual void ArcSec::Policy::make_policy () [inline, virtual]`

Parse XMLNode, and construct the low-level Rule object

6.209.3.8 `virtual void ArcSec::Policy::setEvalResult (EvalResult & res) [pure virtual]`

Set evaluation result

6.209.3.9 `virtual void ArcSec::Policy::setEvaluatorContext (EvaluatorContext *) [inline, virtual]`

Set **Evaluator** (p. 149) Context for the usage in creating low-level policy object

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

- Policy.h

6.210 ArcSec::PolicyStore::PolicyElement Class Reference

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

- PolicyStore.h

6.211 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)

6.211.1 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.).

6.211.2 Member Function Documentation

6.211.2.1 `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. 152) which includes the ****Factory**

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

- PolicyParser.h

6.212 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)

6.212.1 Detailed Description

Storage place for policy objects.

6.212.2 Constructor & Destructor Documentation

6.212.2.1 `ArcSec::PolicyStore::PolicyStore (const std::string & alg, const std::string & policyclassname, EvaluatorContext * ctx)`

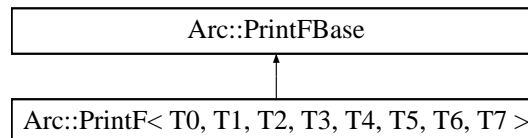
Creates policy store with specified combining algorithm (alg - not used yet), policy name (policyclassname) and context (ctx)

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

- PolicyStore.h

6.213 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 >:



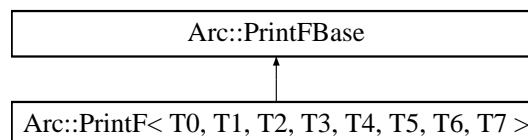
template<class **T0** = int, class **T1** = int, class **T2** = int, class **T3** = int, class **T4** = int, class **T5** = int, class **T6** = int, class **T7** = int> class Arc::Printf< **T0**, **T1**, **T2**, **T3**, **T4**, **T5**, **T6**, **T7** >

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

- IString.h

6.214 Arc::PrintfBase Class Reference

Inheritance diagram for Arc::PrintfBase:

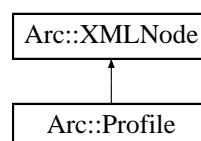


The documentation for this class was generated from the following file:

- IString.h

6.215 Arc::Profile Class Reference

Inheritance diagram for Arc::Profile:



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

- Profile.h

6.216 ArcCredential::PROXYCERTINFO_st Struct Reference

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

- Proxycertinfo.h

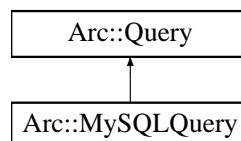
6.217 ArcCredential::PROXYPOLICY_st Struct Reference

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

- Proxycertinfo.h

6.218 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

6.218.1 Constructor & Destructor Documentation

6.218.1.1 Arc::Query::Query () [inline]

Default constructor

6.218.1.2 Arc::Query::Query (Database * *db*) [inline]

Constructor

Parameters

db The database object which will be used by **Query** (p. 265) class to get the database connection

6.218.1.3 virtual Arc::Query::~~Query () [inline, virtual]

Deconstructor

6.218.2 Member Function Documentation

6.218.2.1 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. 229).

6.218.2.2 virtual bool Arc::Query::get_array (std::string & *sqlstr*, QueryArrayResult & *result*, std::vector< std::string > & *arguments*) [pure virtual]

Query (p. 265) 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. 229).

6.218.2.3 virtual int Arc::Query::get_num_columns () [pure virtual]

Get the colum number in the query result

Implemented in **Arc::MySQLQuery** (p. 230).

6.218.2.4 virtual int Arc::Query::get_num_rows () [pure virtual]

Get the row number in the query result

Implemented in **Arc::MySQLQuery** (p. 230).

6.218.2.5 virtual QueryRowResult Arc::Query::get_row (int *row_number*) const [pure virtual]

Get the value of one row in the query result

Parameters

row_number The number of the row

Returns

A vector includes all the values in the row

Implemented in **Arc::MySQLQuery** (p. 230).

6.218.2.6 virtual QueryRowResult Arc::Query::get_row () const [pure virtual]

Get the value of one row in the query result, the row number will be automatically increased each time the method is called

Implemented in **Arc::MySQLQuery** (p. 230).

6.218.2.7 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. 230).

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

- DBInterface.h

6.219 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

6.220 Arc::Register_Info_Type Struct Reference

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

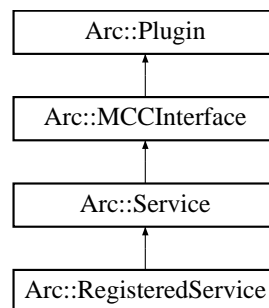
- InfoRegister.h

6.221 Arc::RegisteredService Class Reference

RegisteredService (p. 268) - extension of **Service** (p. 288) performing self-registration.

```
#include <RegisteredService.h>
```

Inheritance diagram for Arc::RegisteredService:



Public Member Functions

- **RegisteredService** (**Config** *)

6.221.1 Detailed Description

RegisteredService (p. 268) - extension of **Service** (p. 288) performing self-registration.

6.221.2 Constructor & Destructor Documentation

6.221.2.1 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

6.222 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

6.222.1 Detailed Description

A regular expression class. This class is a wrapper around the functions provided in regex.h.

6.222.2 Member Function Documentation

6.222.2.1 bool **Arc::RegularExpression::match** (const std::string & *str*, std::list< std::string > & *unmatched*, std::list< std::string > & *matched*) const

Returns true if this regex matches the string provided.

Unmatched parts of the string are stored in 'unmatched'. Matched parts of the string are stored in 'matched'. The first entry in matched is the string that matched the regex, and the following entries are parenthesised elements of the regex

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

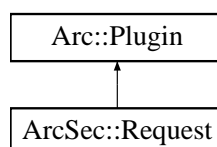
- ArcRegex.h

6.223 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)
- virtual void **addRequestItem** (Attrs &, Attrs &, Attrs &, Attrs &)
- virtual void **setAttributeFactory** (AttributeFactory *attributefactory)=0
- virtual void **make_request** ()=0
- virtual const char * **getEvalName** () const =0
- virtual const char * **getName** () const =0
- **Request** ()
- **Request** (const Source &)

6.223.1 Detailed Description

Base class/Interface for request, includes a container for RequestItems and some operations. A **Request** (p. 269) object can has a few <subjects, actions, objects> tuples, i.e. **RequestItem** (p. 272) The **Request** (p. 269) 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. 269) name="arc.request" /> <.....> </pdp:PDPCfg> </Service>

There can be different types of subclass which inherit **Request** (p. 269), such like XACMLRequest, ArcRequest, GACLRequest

6.223.2 Constructor & Destructor Documentation

6.223.2.1 ArcSec::Request::Request () [inline]

Default constructor

6.223.2.2 ArcSec::Request::Request (const Source &) [inline]

Constructor: Parse request information from a xml stucture in memory

6.223.3 Member Function Documentation

6.223.3.1 virtual void ArcSec::Request::addRequestItem (Attrs &, Attrs &, Attrs &, Attrs &) [inline, virtual]

Add request tuple from non-XMLNode

6.223.3.2 virtual const char* ArcSec::Request::getEvalName () const [pure virtual]

Get the name of corresponding evaulator

6.223.3.3 virtual const char* ArcSec::Request::getName () const [pure virtual]

Get the name of this request

6.223.3.4 virtual ReqItemList ArcSec::Request::getRequestItems () const [inline, virtual]

Get all the **RequestItem** (p. 272) inside **RequestItem** (p. 272) container

6.223.3.5 virtual void ArcSec::Request::make_request () [pure virtual]

Create the objects included in **Request** (p. 269) according to the node attached to the **Request** (p. 269) object

6.223.3.6 virtual void ArcSec::Request::setAttributeFactory (AttributeFactory * attributefactory) [pure virtual]

Set the attribute factory for the usage of **Request** (p. 269)

6.223.3.7 virtual void ArcSec::Request::setRequestItems (ReqItemList) [inline, virtual]

Set the content of the container

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

- Request.h

6.224 ArcSec::RequestAttribute Class Reference

Wrapper which includes **AttributeValue** (p. 56) object which is generated according to date type of one specfic node in Request.xml.

```
#include <RequestAttribute.h>
```

Public Member Functions

- **RequestAttribute** (Arc::XMLNode &node, AttributeFactory *attrfactory)
- **RequestAttribute** & duplicate (RequestAttribute &)

6.224.1 Detailed Description

Wrapper which includes **AttributeValue** (p. 56) object which is generated according to date type of one specfic node in Request.xml.

6.224.2 Constructor & Destructor Documentation

6.224.2.1 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>

6.224.3 Member Function Documentation

6.224.3.1 RequestAttribute& ArcSec::RequestAttribute::duplicate (RequestAttribute &)

Duplicate the parameter into "this"

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

- RequestAttribute.h

6.225 ArcSec::RequestItem Class Reference

Interface for request item container, <subjects, actions, objects, ctxs> tuple.

```
#include <RequestItem.h>
```

Public Member Functions

- RequestItem (Arc::XMLNode &, AttributeFactory *)

6.225.1 Detailed Description

Interface for request item container, <subjects, actions, objects, ctxs> tuple.

6.225.2 Constructor & Destructor Documentation

6.225.2.1 ArcSec::RequestItem::RequestItem (Arc::XMLNode &, AttributeFactory *) [inline]

Constructor

Parameters

node The XMLNode structure of the request item

attributefactory The **AttributeFactory** (p.52) which will be used to generate **RequestAttribute** (p.271)

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

- RequestItem.h

6.226 ArcSec::RequestTuple Class Reference

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

- EvaluationCtx.h

6.227 Arc::ResourceSlotType Class Reference

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

- JobDescription.h

6.228 Arc::ResourcesType Class Reference

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

- JobDescription.h

6.229 Arc::ResourceTargetType Class Reference

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

- JobDescription.h

6.230 ArcSec::Response Class Reference

Container for the evaluation results.

```
#include <Response.h>
```

6.230.1 Detailed Description

Container for the evaluation results.

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

- Response.h

6.231 ArcSec::ResponseItem Class Reference

Evaluation result concerning one **RequestTuple** (p. 272).

```
#include <Response.h>
```

6.231.1 Detailed Description

Evaluation result concerning one **RequestTuple** (p. 272). Include the **RequestTuple** (p. 272), 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

6.232 ArcSec::ResponseList Class Reference

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

- Response.h

6.233 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)
- **void Abandon** (void)

Static Public Member Functions

- static void **AfterFork** (void)

6.233.1 Detailed Description

This class runs external executable. It is possible to read/write it's standard handles or to redirect then to std::string elements.

6.233.2 Constructor & Destructor Documentation

6.233.2.1 Arc::Run::Run (const std::string & *cmdline*)

Constructor preapres object to run cmdline

6.233.2.2 Arc::Run::Run (const std::list< std::string > & *argv*)

Constructor preapres object to run executable and arguments specified in argv

6.233.2.3 Arc::Run::~~Run (void)

Destructor kills running executable and releases associated resources

6.233.3 Member Function Documentation

6.233.3.1 void Arc::Run::Abandon (void)

Detach this object from running process. After calling this method instance is not associated with external process anymore. As result destructor will not kill process.

6.233.3.2 static void Arc::Run::AfterFork (void) [static]

Call this method after fork() in child cporocess. It will reinitialize internal structures for new environment. Do not call it in any other case than defined.

6.233.3.3 void Arc::Run::AssignStderr (std::string & *str*)

Associate stderr handle of executable with string. This method must be called before **Start()** (p. 277). str object must be valid as long as this object exists.

6.233.3.4 void Arc::Run::AssignStdin (std::string & *str*)

Associate stdin handle of executable with string. This method must be called before **Start()** (p. 277). str object must be valid as long as this object exists.

6.233.3.5 void Arc::Run::AssignStdout (std::string & *str*)

Associate stdout handle of executable with string. This method must be called before **Start()** (p. 277). str object must be valid as long as this object exists.

6.233.3.6 void Arc::Run::AssignWorkingDirectory (std::string & *wd*) [inline]

Assign working direcotry of the running process

6.233.3.7 void Arc::Run::CloseStderr (void)

Closes pipe associated with stderr handle

6.233.3.8 void Arc::Run::CloseStdin (void)

Closes pipe associated with stdin handle

6.233.3.9 void Arc::Run::CloseStdout (void)

Closes pipe associated with stdout handle

6.233.3.10 void Arc::Run::KeepStderr (bool *keep* = *true*)

Keep stderr same as parent's if keep = true

6.233.3.11 void Arc::Run::KeepStdin (bool *keep* = *true*)

Keep stdin same as parent's if keep = true

6.233.3.12 void Arc::Run::KeepStdout (bool *keep* = *true*)

Keep stdout same as parent's if keep = true

6.233.3.13 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. Currenly this method does not work for Windows OS

6.233.3.14 Arc::Run::operator bool (void) [inline]

Returns true if object is valid

6.233.3.15 bool Arc::Run::operator! (void) [inline]

Returns true if object is invalid

6.233.3.16 int Arc::Run::ReadStderr (int *timeout*, char * *buf*, int *size*)

Read from stderr handle of running executable. Parameter timeout specifies upper limit for which method will block in milliseconds. Negative means infinite. This method may be used while stderr is directed to string. But result is unpredictable. Returns number of read bytes.

6.233.3.17 int Arc::Run::ReadStdout (int *timeout*, char * *buf*, int *size*)

Read from stdout handle of running executable. Parameter timeout specifies upper limit for which method will block in milliseconds. Negative means infinite. This method may be used while stdout is directed to string. But result is unpredictable. Returns number of read bytes.

6.233.3.18 int Arc::Run::Result (void) [inline]

Returns exit code of execution.

6.233.3.19 bool Arc::Run::Running (void)

Return true if execution is going on.

6.233.3.20 bool Arc::Run::Start (void)

Starts running executable. This method may be called only once.

6.233.3.21 bool Arc::Run::Wait (int *timeout*)

Wait till execution finished or till timeout seconds expires. Returns true if execution is complete.

6.233.3.22 bool Arc::Run::Wait (void)

Wait till execution finished

6.233.3.23 int Arc::Run::WriteStdin (int *timeout*, const char * *buf*, int *size*)

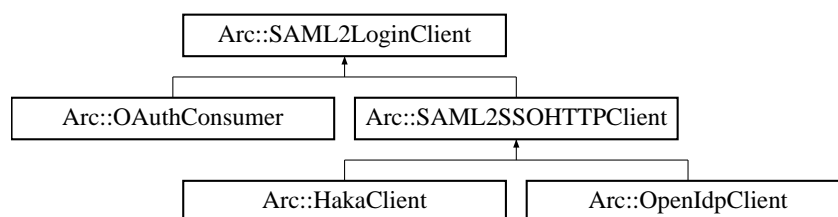
Write to stdin handle of running executable. Parameter timeout specifies upper limit for which method will block in milliseconds. Negative means infinite. This method may be used while stdin is directed to string. But result is unpredictable. Returns number of written bytes.

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

- Run.h

6.234 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** ()

6.234.1 Constructor & Destructor Documentation

6.234.1.1 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.

6.234.2 Member Function Documentation

6.234.2.1 MCC_Status Arc::SAML2LoginClient::findSimpleSAMLInstallation ()

find the location of the simplesamlphp installation on the SP side Will be stored in (*sso_pages)[SimpleSAML]

6.234.2.2 virtual MCC_Status Arc::SAML2LoginClient::processLogin (const std::string *username* = "", const std::string *password* = "") [pure virtual]

Base interface for all login procedures

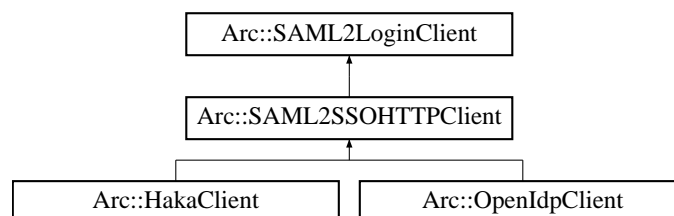
Implemented in **Arc::OAuthConsumer** (p. 232), and **Arc::SAML2SSOHTTPClient** (p. 280).

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

- SAML2LoginClient.h

6.235 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

6.235.1 Member Function Documentation

6.235.1.1 MCC_Status Arc::SAML2SSOHTTPClient::approveCSR (const std::string *approve_page*) [virtual]

Simulate click on the approve cert signing request link

Implements **Arc::SAML2LoginClient** (p. 277).

6.235.1.2 MCC_Status Arc::SAML2SSOHTTPClient::parseDN (std::string * *dn*) [virtual]

Parse the used DN from the Confusa about_you page

Implements **Arc::SAML2LoginClient** (p. 277).

6.235.1.3 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. 169), and **Arc::OpenIdpClient** (p. 233).

6.235.1.4 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. 169), and **Arc::OpenIdpClient** (p. 233).

6.235.1.5 virtual MCC_Status Arc::SAML2SSOHTTPClient::processIdPLogin (const std::string *username*, const std::string *password*) [protected, pure virtual]

Actual identity provider parsers for next three methods implemented in subdirectory idp/

Parse identity provider login page and submit username and password in the previsioned way

Implemented in **Arc::HakaClient** (p. 169), and **Arc::OpenIdpClient** (p. 233).

6.235.1.6 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. 278).

6.235.1.7 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. 277).

6.235.1.8 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. 277).

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

- SAML2LoginClient.h

6.236 Arc::SAMLToken Class Reference

Class for manipulating SAML Token **Profile** (p. 264).

```
#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)

6.236.1 Detailed Description

Class for manipulating SAML Token **Profile** (p. 264). This class is for generating/consuming SAML Token profile. See WS-Security SAML Token **Profile** (p. 264) 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. 264) v1.1 specification) is supported, which means the implementation can only process SAML assertion "referenced from Key-Info", 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. 264) 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).

6.236.2 Member Enumeration Documentation

6.236.2.1 enum Arc::SAMLToken::SAMLVersion

Since the specification SAMLVersion is for distinguishing two types of saml version. It is used as the parameter of constructor.

6.236.3 Constructor & Destructor Documentation

6.236.3.1 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. 280) object will be used for authentication.

Parameters

soap The SOAP message which contains the **SAMLTOKEN** (p. 280) in the soap header

6.236.3.2 `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.

6.236.3.3 `Arc::SAMLToken::~~SAMLToken (void)`

Deconstructor. Nothing to be done except finalizing the xmlsec library.

6.236.4 Member Function Documentation

6.236.4.1 `bool Arc::SAMLToken::Authenticate (const std::string & cafile, const std::string & capath)`

Check signature by using the trusted certificates It is used by relying parting after calling **SAMLTOKEN(SOAPEnvelope& soap)** (p. 281) 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

6.236.4.2 `bool Arc::SAMLToken::Authenticate (void)`

Check signature by using the cert information in soap message

6.236.4.3 Arc::SAMLToken::operator bool (void)

Returns true of constructor succeeded

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

- SAMLToken.h

6.237 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

6.238 Arc::ScalableTime< int > Class Template Reference

```
template<> class Arc::ScalableTime< int >
```

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

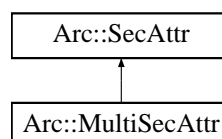
- JobDescription.h

6.239 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

6.239.1 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.

6.239.2 Member Function Documentation

6.239.2.1 `virtual bool Arc::SecAttr::Export (SecAttrFormat format, std::string & val) const` **[virtual]**

Convert internal structure into specified format. Returns false if format is not supported/suitable for this attribute.

6.239.2.2 `virtual bool Arc::SecAttr::Export (SecAttrFormat format, XMLNode & val) const` **[virtual]**

Convert internal structure into specified format. Returns false if format is not supported/suitable for this attribute. XML node referenced by is turned into top level element of specified format.

Reimplemented in **Arc::MultiSecAttr** (p. 227).

6.239.2.3 `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 it's implementation is not required yet.

6.239.2.4 `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. 227).

6.239.2.5 `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.

6.239.2.6 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

6.240 Arc::SecAttrFormat Class Reference

Export/import format.

```
#include <SecAttr.h>
```

6.240.1 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:

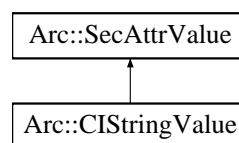
- SecAttr.h

6.241 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** ()

6.241.1 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 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::CStringValue` (p. 68).

6.241.2.2 `bool Arc::SecAttrValue::operator!= (SecAttrValue & b)`

This is a convenience function to allow the usage of "not equal" conditions and need not be overridden.

6.241.2.3 `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:

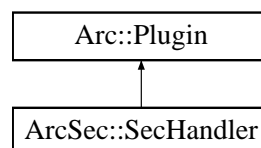
- `SecAttrValue.h`

6.242 ArcSec::SecHandler Class Reference

Base class for simple security handling plugins.

```
#include <SecHandler.h>
```

Inheritance diagram for `ArcSec::SecHandler`:



6.242.1 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. 286) is consumed during creation of instance through XML subtree fed to constructor.

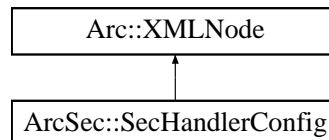
The documentation for this class was generated from the following file:

- SecHandler.h

6.243 ArcSec::SecHandlerConfig Class Reference

```
#include <SecHandler.h>
```

Inheritance diagram for ArcSec::SecHandlerConfig:



6.243.1 Detailed Description

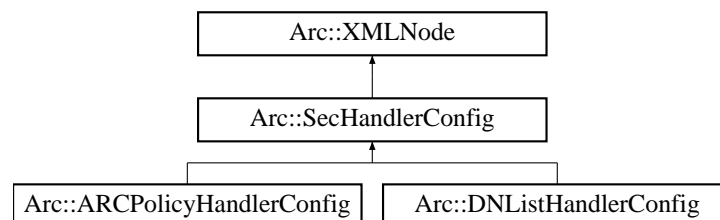
Helper class to create **Security** (p. 288) Handler configuration

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

- SecHandler.h

6.244 Arc::SecHandlerConfig Class Reference

Inheritance diagram for Arc::SecHandlerConfig:

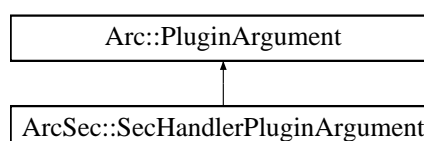


The documentation for this class was generated from the following file:

- ClientInterface.h

6.245 ArcSec::SecHandlerPluginArgument Class Reference

Inheritance diagram for ArcSec::SecHandlerPluginArgument:



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

- SecHandler.h

6.246 ArcSec::Security Class Reference

Common stuff used by security related classes.

```
#include <Security.h>
```

6.246.1 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:

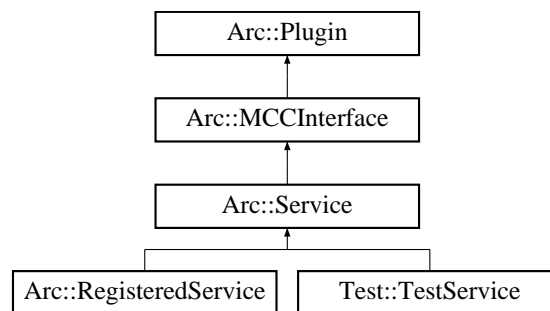
- Security.h

6.247 Arc::Service Class Reference

Service (p. 288) - last component in a **Message** (p. 216) 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="") const

Protected Attributes

- `std::map< std::string, std::list< ArcSec::SecHandler * > > sechandlers_`

Static Protected Attributes

- static `Logger logger`

6.247.1 Detailed Description

Service (p. 288) - last component in a **Message** (p. 216) Chain. This class which defines interface and common functionality for every **Service** (p. 288) plugin. Interface is made of method **process()** (p. 213) which is called by **Plexer** (p. 253) or **MCC** (p. 207) class. There is one **Service** (p. 288) object created for every service description processed by **Loader** (p. 195) class objects. Classes derived from **Service** (p. 288) class must implement **process()** (p. 213) method of **MCCInterface** (p. 213). It is up to developer how internal state of service is stored and communicated to other services and external utilites. **Service** (p. 288) 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. 207) it must accept and generate messages with **PayloadSOAP** (p. 240) payload. Method **process()** (p. 213) of class derived from **Service** (p. 288) 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`.

6.247.2 Constructor & Destructor Documentation

6.247.2.1 Arc::Service::Service (Config *)

Example contructor - Server takes at least it's configuration subtree

6.247.3 Member Function Documentation

6.247.3.1 virtual void Arc::Service::AddSecHandler (Config * cfg, ArcSec::SecHandler * sechandler, const std::string & label = "") [virtual]

Add security components/handlers to this **MCC** (p. 207). For more information please see description of **MCC::AddSecHandler** (p. 209)

6.247.3.2 virtual std::string Arc::Service::getID () [inline, virtual]

Service (p. 288) may implement own service identifier gathering method. This method return identifier of service which is used for registering it Information Services.

6.247.3.3 bool Arc::Service::ProcessSecHandlers (Message & message, const std::string & label = "") const [protected]

Executes security handlers of specified queue. For more information please see description of **MCC::ProcessSecHandlers** (p. 209)

6.247.3.4 virtual bool Arc::Service::RegistrationCollector (XMLNode & *doc*) [virtual]

Service (p. 288) specific registartion collector, used for generate service registartions. In implemented service this method should generate GLUE2 document with part of service description which service wishes to advertise to Information Services.

6.247.4 Field Documentation

6.247.4.1 Logger Arc::Service::logger [static, protected]

Logger (p. 199) object used to print messages generated by this class.

6.247.4.2 std::map<std::string,std::list<ArcSec::SecHandler*> > Arc::Service::sechandlers_ [protected]

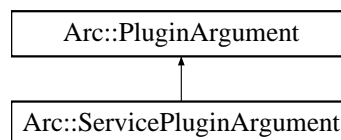
Set of labeled authentication and authorization handlers. **MCC** (p.207) calls sequence of handlers at specific point depending on associated identifier. in most aces those are "in" and "out" for incoming and outgoing messages correspondingly.

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

- Service.h

6.248 Arc::ServicePluginArgument Class Reference

Inheritance diagram for Arc::ServicePluginArgument:



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

- Service.h

6.249 Arc::SimpleCondition Class Reference

Simple triggered condition.

```
#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)

6.249.1 Detailed Description

Simple triggered condition. Provides condition and semaphor objects in one element.

6.249.2 Member Function Documentation

6.249.2.1 void Arc::SimpleCondition::broadcast (void) [inline]

Signal about condition to all waiting threads

6.249.2.2 void Arc::SimpleCondition::lock (void) [inline]

Acquire semaphor

6.249.2.3 void Arc::SimpleCondition::reset (void) [inline]

Reset object to initial state

6.249.2.4 void Arc::SimpleCondition::signal (void) [inline]

Signal about condition

6.249.2.5 void Arc::SimpleCondition::signal_nonblock (void) [inline]

Signal about condition without using semaphor

6.249.2.6 void Arc::SimpleCondition::unlock (void) [inline]

Release semaphor

6.249.2.7 bool Arc::SimpleCondition::wait (int t) [inline]

Wait for condition no longer than t milliseconds

6.249.2.8 void Arc::SimpleCondition::wait (void) [inline]

Wait for condition

6.249.2.9 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

6.250 Arc::SimpleCounter Class Reference

Public Member Functions

- bool wait (int t)

6.250.1 Member Function Documentation

6.250.1.1 bool Arc::SimpleCounter::wait (int t) [inline]

Wait for condition no longer than t milliseconds

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

- Thread.h

6.251 Arc::SOAPMessage Class Reference

Message (p. 216) 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)

6.251.1 Detailed Description

Message (p. 216) restricted to SOAP payload. This is a special **Message** (p. 216) 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. 216) but can carry only SOAP content.

6.251.2 Constructor & Destructor Documentation

6.251.2.1 Arc::SOAPMessage::SOAPMessage (void) [inline]

Dummy constructor

6.251.2.2 Arc::SOAPMessage::SOAPMessage (long msg_ptr_addr)

Copy constructor. Used by language bindings

6.251.2.3 Arc::SOAPMessage::SOAPMessage (Message & msg)

Copy constructor. Ensures shallow copy.

6.251.2.4 Arc::SOAPMessage::~~SOAPMessage (void)

Destructor does not affect referred objects

6.251.3 Member Function Documentation

6.251.3.1 MessageAttributes* Arc::SOAPMessage::Attributes (void) [inline]

Returns a pointer to the current attributes object or NULL if no attributes object has been assigned.

6.251.3.2 SOAPEnvelope* Arc::SOAPMessage::Payload (void)

Returns pointer to current payload or NULL if no payload assigned.

6.251.3.3 void Arc::SOAPMessage::Payload (SOAPEnvelope * new_payload)

Replace payload with a COPY of new one

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

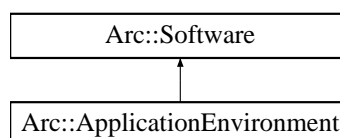
- SOAPMessage.h

6.252 Arc::Software Class Reference

Used to represent software (names and version) and comparison.

```
#include <Software.h>
```

Inheritance diagram for Arc::Software:



Public Types

- enum **ComparisonOperatorEnum** {
 NOTEQUAL = 0, **EQUAL** = 1, **GREATERTHAN** = 2, **LESSTHAN** = 3,
 GREATERTHANOEQUAL = 4, **LESSTHANOEQUAL** = 5 }
- typedef bool(**Software**::* **ComparisonOperator**)(const **Software** &) const

Public Member Functions

- **Software** ()
- **Software** (const std::string &name_version)
- **Software** (const std::string &name, const std::string &version)
- **Software** (const std::string &family, const std::string &name, const std::string &version)
- bool **empty** () const
- bool **operator==** (const **Software** &sw) const
- bool **operator!=** (const **Software** &sw) const
- bool **operator>** (const **Software** &sw) const
- bool **operator<** (const **Software** &sw) const
- bool **operator>=** (const **Software** &sw) const
- bool **operator<=** (const **Software** &sw) const
- std::string **operator()** () const
- **operator std::string** (void) const
- const std::string &**getFamily** () const
- const std::string &**getName** () const
- const std::string &**getVersion** () const

Static Public Member Functions

- static **ComparisonOperator** **convert** (const **ComparisonOperatorEnum** &co)
- static std::string **toString** (**ComparisonOperator** co)

Static Public Attributes

- static const std::string **VERSIONTOKENS**

Friends

- std::ostream & **operator<<** (std::ostream &out, const **Software** &sw)

6.252.1 Detailed Description

Used to represent software (names and version) and comparison. The **Software** (p. 293) class is used to represent the name of a piece of software internally. Generally software are identified by a name and possibly a version number. Some software can also be categorized by type or family (compilers, operating system, etc.). A software object can be compared to other software objects using the comparison operators contained in this class. The basic usage of this class is to test if some specified software requirement (**SoftwareRequirement** (p. 301)) are fulfilled, by using the comparability of the class.

Internally the **Software** (p. 293) object is represented by a family and name identifier, and the software version is tokenized at the characters defined in **VERSIONTOKENS**, and stored as a list of tokens.

6.252.2 Member Typedef Documentation

6.252.2.1 typedef bool(Software::* Arc::Software::ComparisonOperator)(const Software &) const

Definition of a comparison operator method pointer.

This typedef defines a comparison operator method pointer.

See also

operator== (p. 299),
operator!= (p. 298),
operator> (p. 299),
operator< (p. 298),
operator>= (p. 300),
operator<= (p. 299),
ComparisonOperatorEnum (p. 295).

6.252.3 Member Enumeration Documentation

6.252.3.1 enum Arc::Software::ComparisonOperatorEnum

Comparison operator enum.

The **ComparisonOperatorEnum** (p. 295) enumeration is a 1-1 correspondance between the defined comparison method operators (**Software::ComparisonOperator** (p. 295)), and can be used in circumstances where method pointers are not supported.

Enumerator:

NOTEQUAL see **operator!=** (p. 298)
EQUAL see **operator==** (p. 299)
GREATERTHAN see **operator>** (p. 299)
LESSTHAN see **operator<** (p. 298)
GREATERTHANOREQUAL see **operator>=** (p. 300)
LESSTHANOREQUAL see **operator<=** (p. 299)

6.252.4 Constructor & Destructor Documentation

6.252.4.1 Arc::Software::Software () [inline]

Dummy constructor.

This constructor creates a empty object.

6.252.4.2 Arc::Software::Software (const std::string & name_version)

Create a **Software** (p. 293) object.

Create a **Software** (p. 293) object from a single string composed of a name and a version part. The created object will contain a empty family part. The name and version part of the string will be split at the first occurence of a dash (-) which is followed by a digit (0-9). If the string does not contain such a pattern, the passed string will be taken to be the name and version will be empty.

Parameters

name_version should be a string composed of the name and version of the software to represent.

6.252.4.3 Arc::Software::Software (const std::string & *name*, const std::string & *version*)

Create a **Software** (p. 293) object.

Create a **Software** (p. 293) object with the specified name and version. The family part will be left empty.

Parameters

name the software name to represent.

version the software version to represent.

6.252.4.4 Arc::Software::Software (const std::string & *family*, const std::string & *name*, const std::string & *version*)

Create a **Software** (p. 293) object.

Create a **Software** (p. 293) object with the specified family, name and version.

Parameters

family the software family to represent.

name the software name to represent.

version the software version to represent.

6.252.5 Member Function Documentation

6.252.5.1 static ComparisonOperator Arc::Software::convert (const ComparisonOperatorEnum & *co*) [static]

Convert a **ComparisonOperatorEnum** (p. 295) value to a comparison method pointer.

The passed **ComparisonOperatorEnum** (p. 295) will be converted to a comparison method pointer defined by the **Software::ComparisonOperator** (p. 295) typedef.

This static method is not defined in language bindings created with Swig, since method pointers are not supported by Swig.

Parameters

co a **ComparisonOperatorEnum** (p. 295) value.

Returns

A method pointer to a comparison method is returned.

6.252.5.2 bool Arc::Software::empty () const [inline]

Indicates whether the object is empty.

Returns

`true` if the name of this object is empty, otherwise `false`.

6.252.5.3 const std::string& Arc::Software::getFamily () const [inline]

Get family.

Returns

The family the represented software belongs to is returned.

6.252.5.4 const std::string& Arc::Software::getName () const [inline]

Get name.

Returns

The name of the represented software is returned.

6.252.5.5 const std::string& Arc::Software::getVersion () const [inline]

Get version.

Returns

The version of the represented software is returned.

6.252.5.6 Arc::Software::operator std::string (void) const [inline]

Cast to string.

This casting operator behaves exactly as `operator()()` (p. 298) does. The cast is used like `(std::string) <software-object>`.

See also

`operator()()` (p. 298).

References `operator()()`.

6.252.5.7 `bool Arc::Software::operator!=(const Software & sw) const [inline]`

Inequality operator (non-trivial behaviour).

The inequality operator should be used to test if two **Software** (p. 293) objects are of different versions but share the same name and family. So it should not be used to test if two **Software** (p. 293) objects differ in either name, version or family. Two **Software** (p. 293) objects are unequal if they share the same name and family but have different versions and the versions are non-empty.

Parameters

`sw` is the RHS **Software** (p. 293) object.

Returns

`true` when the two objects are unequal, otherwise `false`.

6.252.5.8 `std::string Arc::Software::operator() () const`

Get string representation.

Returns the string representation of this object, which is 'family'-'name'-'version'.

Returns

The string representation of this object is returned.

See also

`operator std::string()`.

Referenced by `operator std::string()`.

6.252.5.9 `bool Arc::Software::operator<(const Software & sw) const [inline]`

Less-than operator.

The behaviour of this less-than operator is equivalent to the greater-than operator (`operator>()` (p. 299)) with the LHS and RHS swapped.

Parameters

`sw` is the RHS object.

Returns

`true` if the LHS is less than the RHS, otherwise `false`.

See also

`operator>()` (p. 299).

6.252.5.10 bool Arc::Software::operator<= (const Software & sw) const [inline]

Less-than or equal operator.

The LHS object is greater than or equal to the RHS object if the LHS equal the RHS (**operator==()** (p. 299)) or if the LHS is greater than the RHS (**operator>()** (p. 299)).

Parameters

sw is the RHS object.

Returns

`true` if the LHS is less than or equal the RHS, otherwise `false`.

See also

operator==() (p. 299),
operator<() (p. 298).

6.252.5.11 bool Arc::Software::operator== (const Software & sw) const [inline]

Equality operator.

Two **Software** (p. 293) objects are equal 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. This operator can also be represented by the **Software::EQUAL** (p. 295) **ComparisonOperatorEnum** (p. 295) value.

Parameters

sw is the RHS **Software** (p. 293) object.

Returns

`true` when the two objects equals, otherwise `false`.

6.252.5.12 bool Arc::Software::operator> (const Software & sw) const

Greater-than operator.

For the LHS object to be greater than the RHS object they must first share the same family and name and have non-empty versions. Then, the first version token of each object is compared and if they are identical, the two next version tokens will be compared. If not identical, the two tokens will be parsed as integers, and if parsing fails the LHS is not greater than the RHS. If parsing succeeds and the integers equals, the two next tokens will be compared, otherwise the comparison is resolved by the integer comparison.

If the LHS contains more version tokens than the RHS, and the comparison have not been resolved at the point of equal number of tokens, then if the additional tokens contains a token which cannot be parsed to a integer the LHS is not greater than the RHS. If the parsed integer is not 0 then the LHS is greater than the RHS. If the rest of the additional tokens are 0, the LHS is not greater than the RHS.

If the RHS contains more version tokens than the LHS and comparison have not been resolved at the point of equal number of tokens, or simply if comparison have not been resolved at the point of equal number of tokens, then the LHS is not greater than the RHS.

Parameters

sw is the RHS object.

Returns

`true` if the LHS is greater than the RHS, otherwise `false`.

6.252.5.13 bool Arc::Software::operator>= (const Software & sw) const [inline]

Greater-than or equal operator.

The LHS object is greater than or equal to the RHS object if the LHS equal the RHS (**operator==()** (p. 299)) or if the LHS is greater than the RHS (**operator>()** (p. 299)).

Parameters

sw is the RHS object.

Returns

`true` if the LHS is greater than or equal the RHS, otherwise `false`.

See also

operator==() (p. 299),
operator>() (p. 299).

6.252.5.14 static std::string Arc::Software::toString (ComparisonOperator co) [static]

Convert **Software::ComparisonOperator** (p. 295) to a string.

This method is not available in language bindings created by Swig, since method pointers are not supported by Swig.

Parameters

co is a **Software::ComparisonOperator** (p. 295).

Returns

The string representation of the passed **Software::ComparisonOperator** (p. 295) is returned.

6.252.6 Friends And Related Function Documentation**6.252.6.1 std::ostream& operator<< (std::ostream & out, const Software & sw) [friend]**

Write **Software** (p. 293) string representation to a `std::ostream`.

Write the string representation of a **Software** (p. 293) object to a `std::ostream`.

Parameters

out is a `std::ostream` to write the string representation of the **Software** (p. 293) object to.

sw is the **Software** (p. 293) object to write to the `std::ostream`.

Returns

The passed `std::ostream` *out* is returned.

6.252.7 Field Documentation

6.252.7.1 const std::string Arc::Software::VERSIONTOKENS [static]

Tokens used to split version string.

This string constant specifies which tokens will be used to split the version string.

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

- Software.h

6.253 Arc::SoftwareRequirement Class Reference

Class used to express and resolve version requirements on software.

```
#include <Software.h>
```

Public Member Functions

- **SoftwareRequirement** (bool requiresAll=false)
- **SoftwareRequirement** (const **Software** &sw, **Software::ComparisonOperator** swCompOp=&Software::operator==, bool requiresAll=false)
- **SoftwareRequirement** (const **Software** &sw, **Software::ComparisonOperatorEnum** co, bool requiresAll=false)
- **SoftwareRequirement & operator=** (const **SoftwareRequirement** &sr)
- **SoftwareRequirement** (const **SoftwareRequirement** &sr)
- void **add** (const **Software** &sw, **Software::ComparisonOperator** swCompOp=&Software::operator==)
- void **add** (const **Software** &sw, **Software::ComparisonOperatorEnum** co)
- bool **isRequiringAll** () const
- void **setRequirement** (bool all)
- bool **isSatisfied** (const **Software** &sw) const
- bool **isSatisfied** (const std::list< **Software** > &swList) const
- bool **isSatisfied** (const std::list< **ApplicationEnvironment** > &swList) const
- bool **selectSoftware** (const **Software** &sw)
- bool **selectSoftware** (const std::list< **Software** > &swList)
- bool **selectSoftware** (const std::list< **ApplicationEnvironment** > &swList)
- bool **isResolved** () const
- bool **empty** () const
- void **clear** ()
- const std::list< **Software** > & **getSoftwareList** () const
- const std::list< **Software::ComparisonOperator** > & **getComparisonOperatorList** () const

6.253.1 Detailed Description

Class used to express and resolve version requirements on software. A requirement in this class is defined as a pair composed of a **Software** (p. 293) object and either a **Software::ComparisonOperator** (p. 295) method pointer or equally a **Software::ComparisonOperatorEnum** (p. 295) enum value. A **SoftwareRequirement** (p. 301) object can contain multiple of such requirements, and then it can specified if all

these requirements should be satisfied, or if it is enough to satisfy only one of them. The requirements can be satisfied by a single **Software** (p. 293) object or a list of either **Software** (p. 293) or **ApplicationEnvironment** (p. 50) objects, by using the method **isSatisfied()** (p. 305). This class also contain a number of methods (**selectSoftware()** (p. 307)) to select **Software** (p. 293) objects which are satisfying the requirements, and in this way resolving requirements.

6.253.2 Constructor & Destructor Documentation

6.253.2.1 **Arc::SoftwareRequirement::SoftwareRequirement (bool *requiresAll* = *false*) [inline]**

Create a empty **SoftwareRequirement** (p. 301) object.

The created **SoftwareRequirement** (p. 301) object will contain no requirements.

Parameters

requiresAll indicates whether the all requirements have to be satisfied (*true*) or if only a single one (*false*), the default is that only a single requirement need to be satisfied.

6.253.2.2 **Arc::SoftwareRequirement::SoftwareRequirement (const **Software** & *sw*, **Software::ComparisonOperator** *swComOp* = *&Software::operator==*, bool *requiresAll* = *false*)**

Create a **SoftwareRequirement** (p. 301) object.

The created **SoftwareRequirement** (p. 301) object will contain one requirement specified by the **Software** (p. 293) object *sw*, and the **Software::ComparisonOperator** (p. 295) *swComOp*.

This constructor is not available in language bindings created by Swig, since method pointers are not supported by Swig, see **SoftwareRequirement(const **Software**&, **Software::ComparisonOperatorEnum**, bool)** (p. 302) instead.

Parameters

sw is the **Software** (p. 293) object of the requirement to add.

swComOp is the **Software::ComparisonOperator** (p. 295) of the requirement to add.

requiresAll indicates whether the all requirements have to be satisfied (*true*) or if only a single one (*false*), the default is that only a single requirement need to be satisfied.

6.253.2.3 **Arc::SoftwareRequirement::SoftwareRequirement (const **Software** & *sw*, **Software::ComparisonOperatorEnum** *co*, bool *requiresAll* = *false*)**

Create a **SoftwareRequirement** (p. 301) object.

The created **SoftwareRequirement** (p. 301) object will contain one requirement specified by the **Software** (p. 293) object *sw*, and the **Software::ComparisonOperatorEnum** (p. 295) *co*.

Parameters

sw is the **Software** (p. 293) object of the requirement to add.

co is the **Software::ComparisonOperatorEnum** (p. 295) of the requirement to add.

requiresAll indicates whether the all requirements have to be satisfied (*true*) or if only a single one (*false*), the default is that only a single requirement need to be satisfied.

6.253.2.4 Arc::SoftwareRequirement::SoftwareRequirement (const SoftwareRequirement & *sr*) [inline]

Copy constructor.

Create a **SoftwareRequirement** (p. 301) object from another **SoftwareRequirement** (p. 301) object.

Parameters

sr is the **SoftwareRequirement** (p. 301) object to make a copy of.

6.253.3 Member Function Documentation

6.253.3.1 void Arc::SoftwareRequirement::add (const Software & *sw*, Software::ComparisonOperator *swComOp* = &Software::operator==)

Add a **Software** (p. 293) object a corresponding comparison operator to this object.

Adds software name and version to list of requirements and associates the comparison operator with it (equality by default).

This method is not available in language bindings created by Swig, since method pointers are not supported by Swig, see **add(const Software&, Software::ComparisonOperatorEnum)** (p. 303) instead.

Parameters

sw is the **Software** (p. 293) object to add as part of a requirement.

swComOp is the **Software::ComparisonOperator** (p. 295) method pointer to add as part of a requirement, the default operator will be **Software::operator==()** (p. 299).

6.253.3.2 void Arc::SoftwareRequirement::add (const Software & *sw*, Software::ComparisonOperatorEnum *co*)

Add a **Software** (p. 293) object a corresponding comparison operator to this object.

Adds software name and version to list of requirements and associates the comparison operator with it (equality by default).

Parameters

sw is the **Software** (p. 293) object to add as part of a requirement.

co is the **Software::ComparisonOperatorEnum** (p. 295) value to add as part of a requirement, the default enum will be **Software::EQUAL** (p. 295).

6.253.3.3 void Arc::SoftwareRequirement::clear () [inline]

Clear the object.

The requirements in this object will be cleared when invoking this method.

6.253.3.4 `bool Arc::SoftwareRequirement::empty () const [inline]`

Test if the object is empty.

Returns

`true` if this object do no contain any requirements, otherwise `false`.

6.253.3.5 `const std::list<Software::ComparisonOperator>& Arc::SoftwareRequirement::getComparisonOperatorList () const [inline]`

Get list of comparison operators.

Returns

The list of internally stored comparison operators is returned.

See also

`Software::ComparisonOperator` (p. 295),
`getSoftwareList` (p. 304).

6.253.3.6 `const std::list<Software>& Arc::SoftwareRequirement::getSoftwareList () const [inline]`

Get list of **Software** (p. 293) objects.

Returns

The list of internally stored **Software** (p. 293) objects is returned.

See also

`Software` (p. 293),
`getComparisonOperatorList` (p. 304).

6.253.3.7 `bool Arc::SoftwareRequirement::isRequiringAll () const [inline]`

Indicates whether all requirments has to be satisfied.

This method returns `true` if all requirements has to be satisfied. If only one requirement has to be satisfied, `false` is returned.

Returns

`true` if all requirements has to be satisfied, otherwise `false`.

See also

`setRequirement` (p. 308).

6.253.3.8 bool Arc::SoftwareRequirement::isResolved () const

Indicates whether requirements have been resolved or not.

If specified that only one requirement has to be satisfied, then for this object to be resolved it can only contain one requirement and it has use the equal operator (**Software::operator==** (p. 299)).

If specified that all requirements has to be satisfied, then for this object to be resolved each requirement must have a **Software** (p. 293) object with a unique family/name composition, i.e. no other requirements have a **Software** (p. 293) object with the same family/name composition, and each requirement must use the equal operator (**Software::operator==** (p. 299)).

If this object has been resolved then `true` is returned when invoking this method, otherwise `false` is returned.

Returns

`true` if this object have been resolved, otherwise `false`.

6.253.3.9 bool Arc::SoftwareRequirement::isSatisfied (const std::list< ApplicationEnvironment > & swList) const

Test if requirements are satisfied.

This method behaves in exactly the same way as the **isSatisfied(const Software&) const** (p. 305) method does.

Parameters

swList is the list of **ApplicationEnvironment** (p. 50) objects which should be used to try satisfy the requirements.

Returns

`true` if requirements are satisfied, otherwise `false`.

See also

isSatisfied(const Software&) const (p. 305),
isSatisfied(const std::list<Software>&) const (p. 306),
selectSoftware(const std::list<ApplicationEnvironment>&) (p. 307),
isResolved() const (p. 305).

6.253.3.10 bool Arc::SoftwareRequirement::isSatisfied (const Software & sw) const [inline]

Test if requirements are satisfied.

Returns `true` if the requirements are satisfied by the specified **Software** (p. 293) *sw*, otherwise `false` is returned.

Parameters

sw is the **Software** (p. 293) which should satisfy the requirements.

Returns

`true` if requirements are satisfied, otherwise `false`.

See also

isSatisfied(const std::list<Software>&) const (p. 306),
isSatisfied(const std::list<ApplicationEnvironment>&) const (p. 305),
selectSoftware(const Software&) (p. 307),
isResolved() const (p. 305).

References **isSatisfied()**.

Referenced by **isSatisfied()**.

6.253.3.11 **bool Arc::SoftwareRequirement::isSatisfied (const std::list< Software > & *swList*) const**

Test if requirements are satisfied.

Returns `true` if stored requirements are satisfied by software specified in *swList*, otherwise `false` is returned.

Note that if all requirements must be satisfied and multiple requirements exist having identical name and family all these requirements should be satisfied by a single **Software** (p. 293) object.

Parameters

swList is the list of **Software** (p. 293) objects which should be used to try satisfy the requirements.

Returns

`true` if requirements are satisfied, otherwise `false`.

See also

isSatisfied(const Software&) const (p. 305),
isSatisfied(const std::list<ApplicationEnvironment>&) const (p. 305),
selectSoftware(const std::list<Software>&) (p. 306),
isResolved() const (p. 305).

6.253.3.12 **SoftwareRequirement& Arc::SoftwareRequirement::operator= (const SoftwareRequirement & *sr*)**

Assignment operator.

Set this object equal to that of the passed **SoftwareRequirement** (p. 301) object *sr*.

Parameters

sr is the **SoftwareRequirement** (p. 301) object to set object equal to.

6.253.3.13 **bool Arc::SoftwareRequirement::selectSoftware (const std::list< Software > & *swList*)**

Select software.

If the passed list of **Software** (p. 293) objects *swList* do not satisfy the requirements `false` is returned and this object is not modified. If however the list of **Software** (p. 293) objects *swList* do satisfy the requirements `true` is returned and the **Software** (p. 293) objects satisfying the requirements will replace these

with the equality operator (**Software::operator==** (p. 299)) used as the comparator for the new requirements.

Note that if all requirements must be satisfied and multiple requirements exist having identical name and family all these requirements should be satisfied by a single **Software** (p. 293) object and it will replace all these requirements.

Parameters

swList is a list of **Software** (p. 293) objects used to satisfy requirements.

Returns

`true` if requirements are satisfied, otherwise `false`.

See also

selectSoftware(const Software&) (p. 307),
selectSoftware(const std::list<ApplicationEnvironment>&) (p. 307),
isSatisfied(const std::list<Software>&) const (p. 306),
isResolved() const (p. 305).

6.253.3.14 bool Arc::SoftwareRequirement::selectSoftware (const Software & sw) [inline]

Select software.

If the passed **Software** (p. 293) *sw* do not satisfy the requirements `false` is returned and this object is not modified. If however the **Software** (p. 293) object *sw* do satisfy the requirements `true` is returned and the requirements are set to equal the *sw* **Software** (p. 293) object.

Parameters

sw is the **Software** (p. 293) object used to satisfy requirements.

Returns

`true` if requirements are satisfied, otherwise `false`.

See also

selectSoftware(const std::list<Software>&) (p. 306),
selectSoftware(const std::list<ApplicationEnvironment>&) (p. 307),
isSatisfied(const Software&) const (p. 305),
isResolved() const (p. 305).

References **selectSoftware()**.

Referenced by **selectSoftware()**.

6.253.3.15 bool Arc::SoftwareRequirement::selectSoftware (const std::list<ApplicationEnvironment> & swList)

Select software.

This method behaves exactly as the **selectSoftware(const std::list<Software>&)** (p. 306) method does.

Parameters

swList is a list of **ApplicationEnvironment** (p. 50) objects used to satisfy requirements.

Returns

`true` if requirements are satisfied, otherwise `false`.

See also

selectSoftware(const Software&) (p. 307),
selectSoftware(const std::list<Software>&) (p. 306),
isSatisfied(const std::list<ApplicationEnvironment>&) const (p. 305),
isResolved() const (p. 305).

6.253.3.16 void Arc::SoftwareRequirement::setRequirement (bool *all*) [inline]

Set relation between requirements.

Specifies if all requirements stored need to be satisfied or if it is enough to satisfy only one of them.

Parameters

all is a boolean specifying if all requirements has to be satisfied.

See also

isRequiringAll() (p. 304).

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

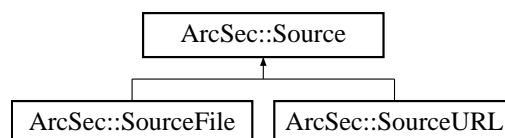
- Software.h

6.254 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)

6.254.1 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.

6.254.2 Constructor & Destructor Documentation

6.254.2.1 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.

6.254.2.2 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:

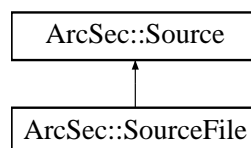
- Source.h

6.255 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)

6.255.1 Detailed Description

Convenience class for obtaining XML document from file.

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

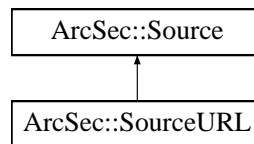
- Source.h

6.256 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)

6.256.1 Detailed Description

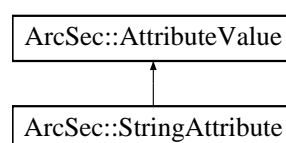
Convenience class for obtaining XML document from remote URL.

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

- Source.h

6.257 ArcSec::StringAttribute Class Reference

Inheritance diagram for ArcSec::StringAttribute:



Public Member Functions

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

6.257.1 Member Function Documentation

6.257.1.1 virtual std::string ArcSec::StringAttribute::encode () [inline, virtual]

encode the value in a string format

Implements **ArcSec::AttributeValue** (p. 57).

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

Evaluate whether "this" equals to the parameter value

Implements **ArcSec::AttributeValue** (p. 57).

6.257.1.3 virtual std::string ArcSec::StringAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

6.257.1.4 virtual std::string ArcSec::StringAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

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

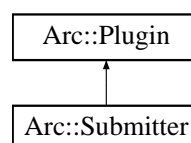
- StringAttribute.h

6.258 Arc::Submitter Class Reference

Base class for the Submitters.

```
#include <Submitter.h>
```

Inheritance diagram for Arc::Submitter:



Public Member Functions

- **URL Submit** (const **JobDescription** &jobdesc, const **ExecutionTarget** &et)
- **URL Migrate** (const **URL** &jobid, const **JobDescription** &jobdesc, const **ExecutionTarget** &et, bool forcemigration)

Protected Attributes

- const **ExecutionTarget** * target

6.258.1 Detailed Description

Base class for the Submitters. **Submitter** (p. 311) is the base class for Grid middleware specialized **Submitter** (p. 311) objects. The class submits job(s) to the computing resource it represents and uploads (needed by the job) local input files.

6.258.2 Member Function Documentation

6.258.2.1 **URL Arc::Submitter::Migrate (const *URL* & *jobid*, const *JobDescription* & *jobdesc*, const *ExecutionTarget* & *et*, bool *forcemigration*)**

This virtual method should be overridden by plugins which should be capable of migrating jobs. The active job which should be migrated is pointed to by the **URL** (p. 330) jobid, and is represented by the **JobDescription** (p. 191) jobdesc. The forcemigration boolean specifies if the migration should succeed if the active job cannot be terminated. The protected method AddJob can be used to save job information. This method should return the **URL** (p. 330) of the migrated job. In case migration fails an empty **URL** (p. 330) should be returned.

6.258.2.2 **URL Arc::Submitter::Submit (const *JobDescription* & *jobdesc*, const *ExecutionTarget* & *et*)**

This virtual method should be overridden by plugins which should be capable of submitting jobs, defined in the **JobDescription** (p. 191) jobdesc, to the **ExecutionTarget** (p. 154) et. The protected convenience method AddJob can be used to save job information. This method should return the **URL** (p. 330) of the submitted job. In case submission fails an empty **URL** (p. 330) should be returned.

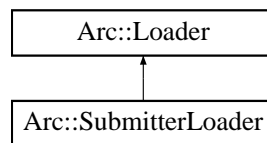
The documentation for this class was generated from the following file:

- Submitter.h

6.259 Arc::SubmitterLoader Class Reference

```
#include <Submitter.h>
```

Inheritance diagram for Arc::SubmitterLoader:



Public Member Functions

- **SubmitterLoader** ()
- **~SubmitterLoader** ()
- **Submitter * load** (const std::string &name, const **UserConfig** &usercfg)
- const std::list< **Submitter** * > & **GetSubmitters** () const

6.259.1 Detailed Description

Class responsible for loading **Submitter** (p. 311) plugins The **Submitter** (p. 311) objects returned by a **SubmitterLoader** (p. 312) must not be used after the **SubmitterLoader** (p. 312) goes out of scope.

6.259.2 Constructor & Destructor Documentation

6.259.2.1 Arc::SubmitterLoader::SubmitterLoader ()

Constructor Creates a new **SubmitterLoader** (p. 312).

6.259.2.2 Arc::SubmitterLoader::~~SubmitterLoader ()

Destructor Calling the destructor destroys all Submitters loaded by the **SubmitterLoader** (p. 312) instance.

6.259.3 Member Function Documentation

6.259.3.1 const std::list<Submitter*>& Arc::SubmitterLoader::GetSubmitters () const [inline]

Retrieve the list of loaded Submitters.

Returns

A reference to the list of Submitters.

6.259.3.2 Submitter* Arc::SubmitterLoader::load (const std::string & name, const UserConfig & usercfg)

Load a new **Submitter** (p. 311)

Parameters

name The name of the **Submitter** (p. 311) to load.

usercfg The **UserConfig** (p. 340) object for the new **Submitter** (p. 311).

Returns

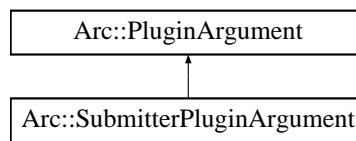
A pointer to the new **Submitter** (p. 311) (NULL on error).

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

- Submitter.h

6.260 Arc::SubmitterPluginArgument Class Reference

Inheritance diagram for Arc::SubmitterPluginArgument:



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

- Submitter.h

6.261 Arc::TargetGenerator Class Reference

Target generation class

```
#include <TargetGenerator.h>
```

Public Member Functions

- **TargetGenerator** (const **UserConfig** &usercfg, unsigned int startDiscovery=0)
- void **GetTargets** (int targetType, int detailLevel)
- void **GetExecutionTargets** ()
- void **GetJobs** ()
- const std::list< **ExecutionTarget** > & **FoundTargets** () const
- std::list< **ExecutionTarget** > & **ModifyFoundTargets** ()
- const std::list< **XMLNode** * > & **FoundJobs** () const
- const std::list< **Job** > & **GetFoundJobs** () const
- bool **AddService** (const std::string Flavour, const **URL** &url)
- bool **AddIndexServer** (const std::string Flavour, const **URL** &url)
- void **AddTarget** (const **ExecutionTarget** &target)
- void **AddJob** (const **XMLNode** &job)
- void **AddJob** (const **Job** &job)
- void **PrintTargetInfo** (bool longlist) const
- void **SaveTargetInfoToStream** (std::ostream &out, bool longlist) const
- **SimpleCounter** & **ServiceCounter** (void)

6.261.1 Detailed Description

Target generation class The **TargetGenerator** (p. 314) class is the umbrella class for resource discovery and information retrieval (index servers and computing clusters). It can also be used to locate user Grid jobs but does not collect the job details. The **TargetGenerator** (p. 314) loads **TargetRetriever** (p. 319) plugins (which implements the actual information retrieval) from **URL** (p. 330) objects found in the **UserConfig** (p. 340) object passed to its constructor using the custom **TargetRetrieverLoader** (p. 320).

6.261.2 Constructor & Destructor Documentation

6.261.2.1 Arc::TargetGenerator::TargetGenerator (const UserConfig & *usercfg*, unsigned int *startDiscovery* = 0)

Create a **TargetGenerator** (p. 314) object.

Default constructor to create a TargetGenerator. The constructor reads the computing and index service **URL** (p. 330) objects from the passed **UserConfig** (p. 340) object using the **UserConfig** (p. 340):GetSelectedServices method. From each **URL** (p. 330) a matching specialized **TargetRetriever** (p. 319) plugin is loaded using the **TargetRetrieverLoader** (p. 320). If the second parameter, startDiscovery, is specified, and matches bitwise either a value of 1, 2 or both, discovery of CEs, jobs or both will be initiated.

Parameters

usercfg is a reference to a **UserConfig** (p. 340) object from which endpoints to computing and/or index services will be used. The object also hold information about user credentials.

startDiscovery specifies whether discovery should be started directly. It will be parsed bitwise. A value of 1 will start CE discovery, 2 jobs, and 3 both, while 0 will not start discovery at all. If this parameter is not specified, it defaults to 0.

6.261.3 Member Function Documentation

6.261.3.1 bool Arc::TargetGenerator::AddIndexServer (const std::string *Flavour*, const URL & *url*)

Add a new index server to the foundIndexServers list.

Method to add a new index server to the list of foundIndexServers in a thread secure way. Compares the argument **URL** (p. 330) against the servers returned by **UserConfig::GetRejectedServices** (p. 353) and only allows to add the service if not specifically rejected.

Parameters

flavour The flavour if the the index server.

url **URL** (p. 330) pointing to the index server.

6.261.3.2 void Arc::TargetGenerator::AddJob (const XMLNode & *job*)

DEPRECATED: Add a new **Job** (p. 184) to this object.

This method is DEPRECATED, use the **AddJob(const Job&)** (p. 316) method instead. Method to add a new **Job** (p. 184) (usually discovered by a **TargetRetriever** (p. 319)) to the internal list of jobs in a thread secure way.

Parameters

job **XMLNode** (p. 399) describing the job.

6.261.3.3 void Arc::TargetGenerator::AddJob (const Job & *job*)

Add a new **Job** (p. 184) to this object.

Method to add a new **Job** (p. 184) (usually discovered by a **TargetRetriever** (p. 319)) to the internal list of jobs in a thread secure way.

Parameters

job **Job** (p. 184) describing the job.

See also

AddJob(const Job&) (p. 316)

6.261.3.4 bool Arc::TargetGenerator::AddService (const std::string *Flavour*, const URL & *url*)

Add a new computing service to the foundServices list.

Method to add a new service to the list of foundServices in a thread secure way. Compares the argument **URL** (p. 330) against the services returned by **UserConfig::GetRejectedServices** (p. 353) and only allows to add the service if not specifically rejected.

Parameters

flavour The flavour if the the computing service.

url **URL** (p. 330) pointing to the information system of the computing service.

6.261.3.5 void Arc::TargetGenerator::AddTarget (const ExecutionTarget & *target*)

Add a new **ExecutionTarget** (p. 154) to the foundTargets list.

Method to add a new **ExecutionTarget** (p. 154) (usually discovered by a **TargetRetriever** (p. 319)) to the list of foundTargets in a thread secure way.

Parameters

target **ExecutionTarget** (p. 154) to be added.

6.261.3.6 const std::list<XMLNode*>& Arc::TargetGenerator::FoundJobs () const

DEPRECATED: Return jobs found by GetTargets.

This method is DEPRECATED, use the GetFoundJobs method instead. Method to return the list of jobs found by a call to the GetJobs method.

Returns

A list of jobs in XML format is returned.

6.261.3.7 const std::list<ExecutionTarget>& Arc::TargetGenerator::FoundTargets () const

Return targets found by GetTargets.

Method to return a const list of **ExecutionTarget** (p. 154) objects (currently only supported Target type) found by the GetTarget method.

6.261.3.8 void Arc::TargetGenerator::GetExecutionTargets ()

Find available Execution Services.

The endpoints specified in the **UserConfig** (p. 340) object passed to this object will be used to discover Computing Elements (**ExecutionTarget** (p. 154)) and information about the discovered CEs will be fetched. The discovery and information retrieval of targets is carried out in parallel threads to speed up the process. If a endpoint is a index service each CE registered at that service will be queried.

See also

GetJobs (p. 317)

6.261.3.9 const std::list<Job>& Arc::TargetGenerator::GetFoundJobs () const

Return jobs found by GetJobs.

Method to return the list of jobs found by a call to the GetJobs method.

Returns

A list of the discovered jobs as **Job** (p. 184) objects is returned

6.261.3.10 void Arc::TargetGenerator::GetJobs ()

Find jobs at Execution Services.

The endpoints specified in the **UserConfig** (p. 340) object passed to this object will be used to discover jobs at these endpoints owned by the user which is identified by the credentials specified in the passed **UserConfig** (p. 340) object. When discovering a job, the available information about this job is fetched as well. If a endpoint is a index service, each CE registered at that service will be queried.

See also

GetExecutionTargets (p. 317)

6.261.3.11 void Arc::TargetGenerator::GetTargets (int targetType, int detailLevel)

DEPRECATED: Find available targets.

This method is DEPRECATED, use the **GetExecutionTargets()** (p. 317) or **GetJobs()** (p. 317) method instead. Method to prepare a list of chosen Targets with a specified detail level. Current implementation supports finding computing elements (**ExecutionTarget** (p. 154)) with full detail level and jobs with limited detail level.

Parameters

targetType 0 = **ExecutionTarget** (p. 154), 1 = Grid jobs
detailLevel

See also

GetExecutionsTargets()
GetJobs() (p. 317)

6.261.3.12 std::list<ExecutionTarget>& Arc::TargetGenerator::ModifyFoundTargets ()

DEPRECATED: Return targets found by GetTargets.

This method is DEPRECATED, use the **FoundTargets()** (p. 317) instead. Method to return the list of **ExecutionTarget** (p. 154) objects (currently only supported Target type) found by the GetTarget method.

6.261.3.13 void Arc::TargetGenerator::PrintTargetInfo (bool *longlist*) const

DEPRECATED: Prints target information.

This method is DEPRECATED, use the SaveTargetInfoToStream method instead. Method to print information of the found targets to std::cout.

Parameters

longlist false for minimal information, true for detailed information

See also

SaveTargetInfoToStream (p. 318)

6.261.3.14 void Arc::TargetGenerator::SaveTargetInfoToStream (std::ostream & *out*, bool *longlist*) const

Prints target information.

Method to print information of the found targets to std::cout.

Parameters

out is a std::ostream object which to direct target information to.
longlist false for minimal information, true for detailed information

6.261.3.15 SimpleCounter& Arc::TargetGenerator::ServiceCounter (void)

Returns reference to worker counter.

This method returns reference to counter which keeps amount of started worker threads communicating with services asynchronously. The counter must be incremented for every thread started and decremented when thread exits. Main thread will then wait till counters drops to zero.

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

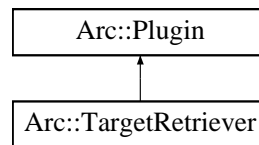
- TargetGenerator.h

6.262 Arc::TargetRetriever Class Reference

TargetRetriever base class

```
#include <TargetRetriever.h>
```

Inheritance diagram for Arc::TargetRetriever:



Public Member Functions

- virtual void **GetTargets** (**TargetGenerator** &mom, int targetType, int detailLevel)=0

Protected Member Functions

- **TargetRetriever** (const **UserConfig** &usercfg, const **URL** &url, ServiceType st, const std::string &flavour)
- virtual void **GetExecutionTargets** (**TargetGenerator** &mom)=0
- virtual void **GetJobs** (**TargetGenerator** &mom)=0

6.262.1 Detailed Description

TargetRetriever base class The **TargetRetriever** (p. 319) class is a pure virtual base class to be used for grid flavour specializations. It is designed to work in conjunction with the **TargetGenerator** (p. 314).

6.262.2 Constructor & Destructor Documentation

6.262.2.1 Arc::TargetRetriever::TargetRetriever (const UserConfig & usercfg, const URL & url, ServiceType st, const std::string & flavour) [protected]

TargetRetriever (p. 319) constructor.

Default constructor to create a TargetGenerator. The constructor reads the computing and index service **URL** (p. 330) objects from the

Parameters

usercfg

url

st

flavour

6.262.3 Member Function Documentation

6.262.3.1 `virtual void Arc::TargetRetriever::GetExecutionTargets (TargetGenerator & mom)` [protected, pure virtual]

Method for collecting targets.

Pure virtual method for collecting targets. Implementation depends on the Grid middleware in question and is thus left to the specialized class.

Parameters

mom is the reference to the **TargetGenerator** (p. 314) which has loaded the **TargetRetriever** (p. 319)

detailLevel is the required level of details (1 = All details, 2 = Limited details)

6.262.3.2 `virtual void Arc::TargetRetriever::GetJobs (TargetGenerator & mom)` [protected, pure virtual]

Method for collecting targets.

Pure virtual method for collecting targets. Implementation depends on the Grid middleware in question and is thus left to the specialized class.

Parameters

mom is the reference to the **TargetGenerator** (p. 314) which has loaded the **TargetRetriever** (p. 319)

detailLevel is the required level of details (1 = All details, 2 = Limited details)

6.262.3.3 `virtual void Arc::TargetRetriever::GetTargets (TargetGenerator & mom, int targetType, int detailLevel)` [pure virtual]

DEPRECATED: Method for collecting targets.

This method is DEPRECATED, the `GetExecutionTargets` and `GetJobs` methods replaces it.

Pure virtual method for collecting targets. Implementation depends on the Grid middleware in question and is thus left to the specialized class.

Parameters

mom is the reference to the **TargetGenerator** (p. 314) which has loaded the **TargetRetriever** (p. 319)

targetType is the identificaion of targets to find (0=ExecutionTargets, 1=Grid Jobs)

detailLevel is the required level of details (1 = All details, 2 = Limited details)

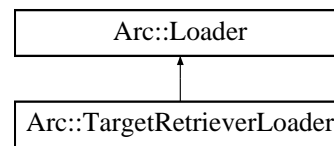
The documentation for this class was generated from the following file:

- TargetRetriever.h

6.263 Arc::TargetRetrieverLoader Class Reference

```
#include <TargetRetriever.h>
```

Inheritance diagram for Arc::TargetRetrieverLoader:



Public Member Functions

- **TargetRetrieverLoader** ()
- **~TargetRetrieverLoader** ()
- **TargetRetriever * load** (const std::string &name, const **UserConfig** &usercfg, const **URL** &url, const **ServiceType** &st)
- const std::list< **TargetRetriever** * > & **GetTargetRetrievers** () const

6.263.1 Detailed Description

Class responsible for loading **TargetRetriever** (p. 319) plugins The **TargetRetriever** (p. 319) objects returned by a **TargetRetrieverLoader** (p. 320) must not be used after the **TargetRetrieverLoader** (p. 320) goes out of scope.

6.263.2 Constructor & Destructor Documentation

6.263.2.1 Arc::TargetRetrieverLoader::TargetRetrieverLoader ()

Constructor Creates a new **TargetRetrieverLoader** (p. 320).

6.263.2.2 Arc::TargetRetrieverLoader::~~TargetRetrieverLoader ()

Destructor Calling the destructor destroys all **TargetRetrievers** loaded by the **TargetRetrieverLoader** (p. 320) instance.

6.263.3 Member Function Documentation

6.263.3.1 const std::list<TargetRetriever*>& Arc::TargetRetrieverLoader::GetTargetRetrievers () const [inline]

Retrieve the list of loaded **TargetRetrievers**.

Returns

A reference to the list of **TargetRetrievers**.

6.263.3.2 TargetRetriever* Arc::TargetRetrieverLoader::load (const std::string & name, const UserConfig & usercfg, const URL & url, const ServiceType & st)

Load a new **TargetRetriever** (p. 319)

Parameters

- name* The name of the **TargetRetriever** (p. 319) to load.
- usercfg* The **UserConfig** (p. 340) object for the new **TargetRetriever** (p. 319).
- url* The **URL** (p. 330) used to contact the target.
- st* specifies service type of the target.

Returns

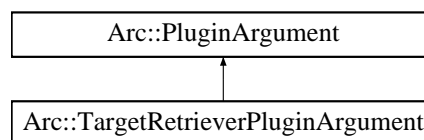
A pointer to the new **TargetRetriever** (p. 319) (NULL on error).

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

- TargetRetriever.h

6.264 Arc::TargetRetrieverPluginArgument Class Reference

Inheritance diagram for Arc::TargetRetrieverPluginArgument:

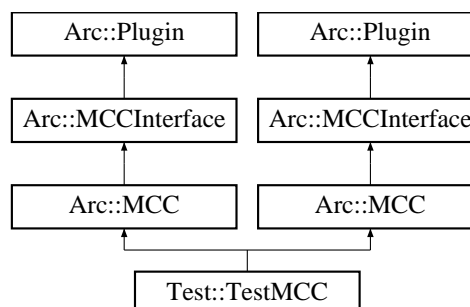


The documentation for this class was generated from the following file:

- TargetRetriever.h

6.265 Test::TestMCC Class Reference

Inheritance diagram for Test::TestMCC:

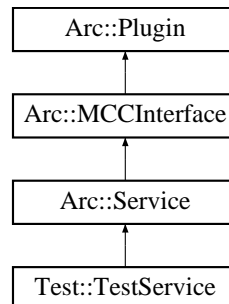


The documentation for this class was generated from the following files:

- loader/TestMCC.h
- message/TestMCC.h

6.266 Test::TestService Class Reference

Inheritance diagram for Test::TestService:



Public Member Functions

- virtual **Arc::MCC_Status** **process** (**Arc::Message** &request, **Arc::Message** &response)

6.266.1 Member Function Documentation

6.266.1.1 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 preceeding MCC in chain when a request needs to be processed. This method must call similar method of next MCC in chain unless any failure happens. Result returned by call to next MCC should be processed and passed back to previous MCC. In case of failure this method is expected to generate valid error response and return it back to previous MCC without calling the next one.

Parameters

request The request that needs to be processed.

response A Message object that will contain the response of the request when the method returns.

Returns

An object representing the status of the call.

Implements **Arc::MCCInterface** (p. 213).

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

- TestService.h

6.267 Arc::ThreadDataItem Class Reference

Base class for per-thread object.

```
#include <Thread.h>
```

Public Member Functions

- **ThreadDataItem** (void)
- **ThreadDataItem** (std::string &key)
- **ThreadDataItem** (const std::string &key)
- void **Attach** (std::string &key)
- void **Attach** (const std::string &key)
- virtual void **Dup** (void)

Static Public Member Functions

- static **ThreadDataItem * Get** (const std::string &key)

6.267.1 Detailed Description

Base class for per-thread object. Classes inherited from this one are attached to current thread under specified key and destroyed only when thread ends or object is replaced by another one with same key.

6.267.2 Constructor & Destructor Documentation

6.267.2.1 Arc::ThreadDataItem::ThreadDataItem (void)

Dummy constructor which does nothing. To make object usable one of Attach(...) methods must be used.

6.267.2.2 Arc::ThreadDataItem::ThreadDataItem (std::string & key)

Creates instance and attaches it to current thread under key. If supplied key is empty random one is generated and stored in key variable.

6.267.2.3 Arc::ThreadDataItem::ThreadDataItem (const std::string & key)

Creates instance and attaches it to current thread under key.

6.267.3 Member Function Documentation

6.267.3.1 void Arc::ThreadDataItem::Attach (std::string & key)

Attaches object to current thread under key. If supplied key is empty random one is generated and stored in key variable. This method must be used only if object was created using dummy constructor.

6.267.3.2 void Arc::ThreadDataItem::Attach (const std::string & key)

Attaches object to current thread under key. This method must be used only if object was created using dummy constructor.

6.267.3.3 virtual void Arc::ThreadDataItem::Dup (void) [virtual]

Creates copy of object. This method is called when new thread is created from current thread. It is called in new thread, so new object - if created - gets attached to new thread. If object is not meant to be inherited by new threads then this method should do nothing.

6.267.3.4 static ThreadDataItem* Arc::ThreadDataItem::Get (const std::string & key) [static]

Retrieves object attached to thread under key. Returns if no such object.

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

- Thread.h

6.268 Arc::ThreadInitializer Class Reference

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

- Thread.h

6.269 Arc::ThreadRegistry Class Reference

```
#include <Thread.h>
```

Public Member Functions

- void **RegisterThread** (void)
- void **UnregisterThread** (void)
- bool **WaitOrCancel** (int timeout)
- bool **WaitForExit** (int timeout=-1)

6.269.1 Detailed Description

This class is a set of conditions, mutexes, etc. conveniently exposed to monitor running child threads and to wait till they exit. There are no protections against race conditions. So use it carefully.

6.269.2 Member Function Documentation**6.269.2.1 bool Arc::ThreadRegistry::WaitForExit (int *timeout* = -1)**

Wait for registered threads to exit. Leave after timeout milliseconds if failed. Returns true if all registered threads reported their exit.

6.269.2.2 bool Arc::ThreadRegistry::WaitOrCancel (int *timeout*)

Wait for timeout milliseconds or cancel request. Returns true if cancel request received.

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

- Thread.h

6.270 Arc::Time Class Reference

A class for storing and manipulating times.

```
#include <DateTime.h>
```

Public Member Functions

- **Time** ()
- **Time** (time_t)
- **Time** (time_t time, uint32_t nanosec)
- **Time** (const std::string &)
- **Time** & **operator=** (time_t)
- **Time** & **operator=** (const **Time** &)
- **Time** & **operator=** (const char *)
- **Time** & **operator=** (const std::string &)
- void **SetTime** (time_t)
- void **SetTime** (time_t time, uint32_t nanosec)
- time_t **GetTime** () const
- **operator std::string** () const
- std::string **str** (const **TimeFormat** &=time_format) const
- bool **operator<** (const **Time** &) const
- bool **operator>** (const **Time** &) const
- bool **operator<=** (const **Time** &) const
- bool **operator>=** (const **Time** &) const
- bool **operator==** (const **Time** &) const
- bool **operator!=** (const **Time** &) const
- **Time** **operator+** (const **Period** &) const
- **Time** **operator-** (const **Period** &) const
- **Period** **operator-** (const **Time** &) const

Static Public Member Functions

- static void **SetFormat** (const **TimeFormat** &)
- static **TimeFormat** **GetFormat** ()

6.270.1 Detailed Description

A class for storing and manipulating times.

6.270.2 Constructor & Destructor Documentation

6.270.2.1 Arc::Time::Time ()

Default constructor. The time is put equal the current time.

6.270.2.2 Arc::Time::Time (time_t)

Constructor that takes a time_t variable and stores it.

6.270.2.3 Arc::Time::Time (time_t time, uint32_t nanosec)

Constructor that takes a fine grained time variables and stores them.

6.270.2.4 Arc::Time::Time (const std::string &)

Constructor that tries to convert a string into a time_t.

6.270.3 Member Function Documentation

6.270.3.1 static TimeFormat Arc::Time::GetFormat () [static]

Gets the default format for time strings.

6.270.3.2 time_t Arc::Time::GetTime () const

gets the time

6.270.3.3 Arc::Time::operator std::string () const

Returns a string representation of the time, using the default format.

6.270.3.4 bool Arc::Time::operator!= (const Time &) const

Comparing two **Time** (p. 326) objects.

6.270.3.5 Time Arc::Time::operator+ (const Period &) const

Adding **Time** (p. 326) object with **Period** (p. 249) object.

6.270.3.6 Time Arc::Time::operator- (const Period &) const

Subtracting **Period** (p. 249) object from **Time** (p. 326) object.

6.270.3.7 Period Arc::Time::operator- (const Time &) const

Subtracting **Time** (p. 326) object from the other **Time** (p. 326) object.

6.270.3.8 bool Arc::Time::operator< (const Time &) const

Comparing two **Time** (p. 326) objects.

6.270.3.9 bool Arc::Time::operator<= (const Time &) const

Comparing two **Time** (p. 326) objects.

6.270.3.10 Time& Arc::Time::operator= (const char *)

Assignment operator from a char pointer.

6.270.3.11 Time& Arc::Time::operator= (const std::string &)

Assignment operator from a string.

6.270.3.12 Time& Arc::Time::operator= (const Time &)

Assignment operator from a **Time** (p. 326).

6.270.3.13 Time& Arc::Time::operator= (time_t)

Assignment operator from a time_t.

6.270.3.14 bool Arc::Time::operator== (const Time &) const

Comparing two **Time** (p. 326) objects.

6.270.3.15 bool Arc::Time::operator> (const Time &) const

Comparing two **Time** (p. 326) objects.

6.270.3.16 bool Arc::Time::operator>= (const Time &) const

Comparing two **Time** (p. 326) objects.

6.270.3.17 static void Arc::Time::SetFormat (const TimeFormat &) [static]

Sets the default format for time strings.

6.270.3.18 void Arc::Time::SetTime (time_t)

sets the time

6.270.3.19 void Arc::Time::SetTime (time_t *time*, uint32_t *nanosec*)

sets the fine grained time

6.270.3.20 std::string Arc::Time::str (const TimeFormat & = *time_format*) const

Returns a string representation of the time, using the specified format.

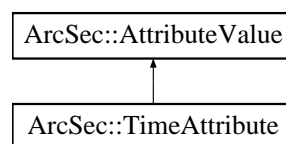
The documentation for this class was generated from the following file:

- DateTime.h

6.271 ArcSec::TimeAttribute Class Reference

```
#include <DateTimeAttribute.h>
```

Inheritance diagram for ArcSec::TimeAttribute:

**Public Member Functions**

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

6.271.1 Detailed Description

Format: HHMMSSZ HH:MM:SS HH:MM:SS+HH:MM HH:MM:SSZ

6.271.2 Member Function Documentation**6.271.2.1 virtual std::string ArcSec::TimeAttribute::encode () [virtual]**

encode the value in a string format

Implements ArcSec::AttributeValue (p. 57).

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

Evaluate whether "this" equals to the parameter value

Implements ArcSec::AttributeValue (p. 57).

6.271.2.3 virtual std::string ArcSec::TimeAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

6.271.2.4 virtual std::string ArcSec::TimeAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

Implements **ArcSec::AttributeValue** (p. 57).

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

- DateTimeAttribute.h

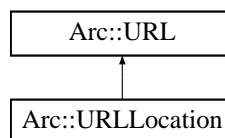
6.272 Arc::TimedMutex Class Reference

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

- Thread.h

6.273 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)
- bool **IsSecureProtocol** () const
- const std::string & **Username** () const
- const std::string & **Passwd** () const
- const std::string & **Host** () const
- void **ChangeHost** (const std::string &newhost)

- int **Port** () const
- void **ChangePort** (int newport)
- const std::string & **Path** () const
- std::string **FullPath** () const
- 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)
- void **AddMetaDataOption** (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 **plainstr** () const
- virtual std::string **fullstr** () const
- virtual std::string **ConnectionURL** () const
- bool **operator**< (const **URL** &url) const
- bool **operator**== (const **URL** &url) const
- **operator** bool () const
- 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**
- bool **ip6addr**

- `int port`
- `std::string path`
- `std::map< std::string, std::string > httpoptions`
- `std::map< std::string, std::string > metadataoptions`
- `std::list< std::string > ldapattributes`
- `Scope ldapscope`
- `std::string ldapfilter`
- `std::map< std::string, std::string > urloptions`
- `std::list< URLLocation > locations`
- `std::map< std::string, std::string > commonlocoptions`
- `bool valid`

Friends

- `std::ostream & operator<< (std::ostream &out, const URL &u)`

6.273.1 Member Enumeration Documentation

6.273.1.1 `enum Arc::URL::Scope`

Scope for LDAP URLs

6.273.2 Constructor & Destructor Documentation

6.273.2.1 `Arc::URL::URL ()`

Empty constructor. Necessary when the class is part of another class and the like.

6.273.2.2 `Arc::URL::URL (const std::string & url)`

Constructs a new `URL` (p. 330) from a string representation.

6.273.2.3 `virtual Arc::URL::~~URL () [virtual]`

`URL` (p. 330) Destructor

6.273.3 Member Function Documentation

6.273.3.1 `void Arc::URL::AddLDAPAttribute (const std::string & attribute)`

Adds an LDAP attribute.

6.273.3.2 `void Arc::URL::AddMetaDataOption (const std::string & option, const std::string & value, bool overwrite = true)`

Adds a metadata option

6.273.3.3 void Arc::URL::AddOption (const std::string & *option*, const std::string & *value*, bool *overwrite* = *true*)

Adds a **URL** (p. 330) option.

6.273.3.4 static std::string Arc::URL::BaseDN2Path (const std::string &) [static, protected]

a private method that converts an ldap basedn to a path.

6.273.3.5 void Arc::URL::ChangeHost (const std::string & *newhost*)

Changes the hostname of the **URL** (p. 330).

6.273.3.6 void Arc::URL::ChangeLDAPFilter (const std::string & *newfilter*)

Changes the LDAP filter.

6.273.3.7 void Arc::URL::ChangeLDAPScope (const Scope *newscope*)

Changes the LDAP scope.

6.273.3.8 void Arc::URL::ChangePath (const std::string & *newpath*)

Changes the path of the **URL** (p. 330).

6.273.3.9 void Arc::URL::ChangePort (int *newport*)

Changes the port of the **URL** (p. 330).

6.273.3.10 void Arc::URL::ChangeProtocol (const std::string & *newprot*)

Changes the protocol of the **URL** (p. 330).

6.273.3.11 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.

6.273.3.12 const std::map<std::string, std::string>& Arc::URL::CommonLocOptions () const

Returns the common location options if any.

6.273.3.13 `virtual std::string Arc::URL::ConnectionURL () const [virtual]`

Returns a string representation with protocol, host and port only

6.273.3.14 `std::string Arc::URL::FullPath () const`

Returns the path of the **URL** (p. 330) with all options attached.

6.273.3.15 `virtual std::string Arc::URL::fullstr () const [virtual]`

Returns a string representation including options and locations

Reimplemented in **Arc::URLLocation** (p. 339).

6.273.3.16 `const std::string& Arc::URL::Host () const`

Returns the hostname of the **URL** (p. 330).

6.273.3.17 `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.

6.273.3.18 `const std::map<std::string, std::string>& Arc::URL::HTTPOptions () const`

Returns HTTP options if any.

6.273.3.19 `bool Arc::URL::IsSecureProtocol () const`

Indicates whether the protocol is secure or not.

6.273.3.20 `const std::list<std::string>& Arc::URL::LDAPAttributes () const`

Returns the LDAP attributes if any.

6.273.3.21 `const std::string& Arc::URL::LDAPFilter () const`

Returns the LDAP filter.

6.273.3.22 `Scope Arc::URL::LDAPScope () const`

Returns the LDAP scope.

6.273.3.23 `const std::list<URLLocation>& Arc::URL::Locations () const`

Returns the locations if any.

6.273.3.24 `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.

6.273.3.25 `const std::map<std::string, std::string>& Arc::URL::MetaDataOptions () const`

Returns metadata options if any.

6.273.3.26 `Arc::URL::operator bool () const`

Check if instance holds valid **URL** (p. 330)

6.273.3.27 `bool Arc::URL::operator< (const URL & url) const`

Compares one **URL** (p. 330) to another

6.273.3.28 `bool Arc::URL::operator==(const URL & url) const`

Is one **URL** (p. 330) equal to another?

6.273.3.29 `const std::string& Arc::URL::Option (const std::string & option, const std::string & undefined = "") const`

Returns the value of a **URL** (p. 330) option.

Parameters

option The option whose value is returned.

undefined This value is returned if the **URL** (p. 330) option is not defined.

6.273.3.30 `const std::map<std::string, std::string>& Arc::URL::Options () const`

Returns **URL** (p. 330) options if any.

6.273.3.31 `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

6.273.3.32 `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

6.273.3.33 `const std::string& Arc::URL::Passwd () const`

Returns the password of the **URL** (p. 330).

6.273.3.34 `const std::string& Arc::URL::Path () const`

Returns the path of the **URL** (p. 330).

6.273.3.35 `static std::string Arc::URL::Path2BaseDN (const std::string &) [static, protected]`

a private method that converts an ldap path to a basedn.

6.273.3.36 `virtual std::string Arc::URL::plainstr () const [virtual]`

Returns a string representation of the **URL** (p. 330) without any options

6.273.3.37 `int Arc::URL::Port () const`

Returns the port of the **URL** (p. 330).

6.273.3.38 `const std::string& Arc::URL::Protocol () const`

Returns the protocol of the **URL** (p. 330).

6.273.3.39 `virtual std::string Arc::URL::str () const [virtual]`

Returns a string representation of the **URL** (p. 330) including meta-options.

Reimplemented in **Arc::URLLocation** (p. 340).

6.273.3.40 `const std::string& Arc::URL::Username () const`

Returns the username of the **URL** (p. 330).

6.273.4 Friends And Related Function Documentation

6.273.4.1 `std::ostream& operator<< (std::ostream & out, const URL & u) [friend]`

Overloaded operator << to print a **URL** (p. 330).

6.273.5 Field Documentation

6.273.5.1 `std::map<std::string, std::string> Arc::URL::commonlocoptions` [protected]

common location options for index server URLs.

6.273.5.2 `std::string Arc::URL::host` [protected]

hostname of the url.

6.273.5.3 `std::map<std::string, std::string> Arc::URL::httpoptions` [protected]

HTTP options of the url.

6.273.5.4 `bool Arc::URL::ip6addr` [protected]

if host is IPv6 numerical address notation.

6.273.5.5 `std::list<std::string> Arc::URL::ldapattributes` [protected]

LDAP attributes of the url.

6.273.5.6 `std::string Arc::URL::ldapfilter` [protected]

LDAP filter of the url.

6.273.5.7 `Scope Arc::URL::ldapscope` [protected]

LDAP scope of the url.

6.273.5.8 `std::list<URLLocation> Arc::URL::locations` [protected]

locations for index server URLs.

6.273.5.9 `std::map<std::string, std::string> Arc::URL::metadataoptions` [protected]

Meta data options

6.273.5.10 `std::string Arc::URL::passwd` [protected]

password of the url.

6.273.5.11 `std::string Arc::URL::path` [protected]

the url path.

6.273.5.12 int Arc::URL::port [protected]

portnumber of the url.

6.273.5.13 std::string Arc::URL::protocol [protected]

the url protocol.

6.273.5.14 std::map<std::string, std::string> Arc::URL::urloptions [protected]

options of the url.

6.273.5.15 std::string Arc::URL::username [protected]

username of the url.

6.273.5.16 bool Arc::URL::valid [protected]

flag to describe validity of **URL** (p. 330)

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

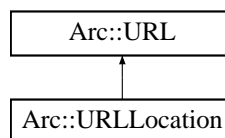
- **URL.h**

6.274 Arc::URLLocation Class Reference

Class to hold a resolved **URL** (p. 330) 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`

6.274.1 Detailed Description

Class to hold a resolved **URL** (p. 330) location. It is specific to file indexing service registrations.

6.274.2 Constructor & Destructor Documentation

6.274.2.1 `Arc::URLLocation::URLLocation (const std::string & url)`

Creates a **URLLocation** (p. 338) from a string representaion.

6.274.2.2 `Arc::URLLocation::URLLocation (const std::string & url, const std::string & name)`

Creates a **URLLocation** (p. 338) from a string representaion and a name.

6.274.2.3 `Arc::URLLocation::URLLocation (const URL & url)`

Creates a **URLLocation** (p. 338) from a **URL** (p. 330).

6.274.2.4 `Arc::URLLocation::URLLocation (const URL & url, const std::string & name)`

Creates a **URLLocation** (p. 338) from a **URL** (p. 330) and a name.

6.274.2.5 `Arc::URLLocation::URLLocation (const std::map< std::string, std::string > & options, const std::string & name)`

Creates a **URLLocation** (p. 338) from options and a name.

6.274.2.6 `virtual Arc::URLLocation::~~URLLocation () [virtual]`

URLLocation (p. 338) destructor.

6.274.3 Member Function Documentation

6.274.3.1 `virtual std::string Arc::URLLocation::fullstr () const [virtual]`

Returns a string representation including options and locations

Reimplemented from **Arc::URL** (p. 334).

6.274.3.2 `const std::string& Arc::URLLocation::Name () const`

Returns the **URLLocation** (p. 338) name.

6.274.3.3 virtual std::string Arc::URLLocation::str () const [virtual]

Returns a string representation of the **URLLocation** (p. 338).

Reimplemented from **Arc::URL** (p. 336).

6.274.4 Field Documentation

6.274.4.1 std::string Arc::URLLocation::name [protected]

the **URLLocation** (p. 338) name as registered in the indexing service.

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

- URL.h

6.275 Arc::URLMap Class Reference

Data Structures

- class **map_entry**

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

- URLMap.h

6.276 Arc::User Class Reference

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

- User.h

6.277 Arc::UserConfig Class Reference

User configuration class

```
#include <UserConfig.h>
```

Public Member Functions

- **UserConfig** (**initializeCredentialsType** initializeCredentials=**initializeCredentialsType**())
- **UserConfig** (const std::string &conffile, **initializeCredentialsType** initializeCredentials=**initializeCredentialsType**(), bool loadSysConfig=true)
- **UserConfig** (const std::string &conffile, const std::string &jfile, **initializeCredentialsType** initializeCredentials=**initializeCredentialsType**(), bool loadSysConfig=true)
- **UserConfig** (const long int &ptraddr)
- void **InitializeCredentials** ()
- bool **CredentialsFound** () const

- bool **LoadConfigurationFile** (const std::string &conffile, bool ignoreJobListFile=true)
- bool **SaveToFile** (const std::string &filename) const
- void **ApplyToConfig** (**BaseConfig** &ccfg) const
- **operator bool** () const
- bool **operator!** () const
- bool **JobListFile** (const std::string &path)
- const std::string & **JobListFile** () const
- bool **AddServices** (const std::list< std::string > &services, ServiceType st)
- bool **AddServices** (const std::list< std::string > &selected, const std::list< std::string > &rejected, ServiceType st)
- const URLListMap & **GetSelectedServices** (ServiceType st) const
- const URLListMap & **GetRejectedServices** (ServiceType st) const
- void **ClearSelectedServices** ()
- void **ClearSelectedServices** (ServiceType st)
- void **ClearRejectedServices** ()
- void **ClearRejectedServices** (ServiceType st)
- bool **Timeout** (int newTimeout)
- int **Timeout** () const
- bool **Verbosity** (const std::string &newVerbosity)
- const std::string & **Verbosity** () const
- bool **Broker** (const std::string &name)
- bool **Broker** (const std::string &name, const std::string &argument)
- const std::pair< std::string, std::string > & **Broker** () const
- bool **Bartender** (const std::vector< **URL** > &urls)
- void **AddBartender** (const **URL** &url)
- const std::vector< **URL** > & **Bartender** () const
- bool **VOMSServerPath** (const std::string &path)
- const std::string & **VOMSServerPath** () const
- bool **UserName** (const std::string &name)
- const std::string & **UserName** () const
- bool **Password** (const std::string &newPassword)
- const std::string & **Password** () const
- bool **ProxyPath** (const std::string &newProxyPath)
- const std::string & **ProxyPath** () const
- bool **CertificatePath** (const std::string &newCertificatePath)
- const std::string & **CertificatePath** () const
- bool **KeyPath** (const std::string &newKeyPath)
- const std::string & **KeyPath** () const
- bool **KeyPassword** (const std::string &newKeyPassword)
- const std::string & **KeyPassword** () const
- bool **KeySize** (int newKeySize)
- int **KeySize** () const
- bool **CACertificatePath** (const std::string &newCACertificatePath)
- const std::string & **CACertificatePath** () const
- bool **CACertificatesDirectory** (const std::string &newCACertificatesDirectory)
- const std::string & **CACertificatesDirectory** () const
- bool **CertificateLifeTime** (const **Period** &newCertificateLifeTime)
- const **Period** & **CertificateLifeTime** () const
- bool **SLCS** (const **URL** &newSLCS)
- const **URL** & **SLCS** () const

- bool **StoreDirectory** (const std::string &newStoreDirectory)
- const std::string & **StoreDirectory** () const
- bool **IdPName** (const std::string &name)
- const std::string & **IdPName** () const
- bool **OverlayFile** (const std::string &path)
- const std::string & **OverlayFile** () const
- bool **UtilsDirPath** (const std::string &dir)
- const std::string & **UtilsDirPath** () const

Static Public Attributes

- static const std::string **ARCUSERDIRECTORY**
- static const std::string **SYSCONFIG**
- static const std::string **SYSCONFIGARCLOC**
- static const std::string **DEFAULTCONFIG**
- static const std::string **EXAMPLECONFIG**
- static const int **DEFAULT_TIMEOUT** = 20
- static const std::string **DEFAULT_BROKER**

6.277.1 Detailed Description

User configuration class This class provides a container for a selection of various attributes/parameters which can be configured to needs of the user, and can be read by implementing instances or programs. The class can be used in two ways. One can create a object from a configuration file, or simply set the desired attributes by using the setter method, associated with every setable attribute. The list of attributes which can be configured in this class are:

- certificatepath / **CertificatePath**(const std::string&) (p. 351)
- keypath / **KeyPath**(const std::string&) (p. 357)
- proxypath / **ProxyPath**(const std::string&) (p. 361)
- cacertificatesdirectory / **CACertificatesDirectory**(const std::string&) (p. 349)
- cacertificatepath / **CACertificatePath**(const std::string&) (p. 349)
- timeout / **Timeout**(int) (p. 364)
- joblist / **JobListFile**(const std::string&) (p. 355)
- defaultservices / **AddServices**(const std::list<std::string>&, const std::list<std::string>&, **ServiceType**) (p. 345)
- rejectservices / **AddServices**(const std::list<std::string>&, const std::list<std::string>&, **ServiceType**) (p. 345)
- verbosity / **Verbosity**(const std::string&) (p. 366)
- brokername / **Broker**(const std::string&) (p. 348) or **Broker**(const std::string&, const std::string&) (p. 348)
- brokerarguments / **Broker**(const std::string&) (p. 348) or **Broker**(const std::string&, const std::string&) (p. 348)

- bartender / **Bartender**(const std::list<URL>&)
- vomsserverpath / **VOMSServerPath**(const std::string&) (p. 366)
- username / **UserName**(const std::string&) (p. 365)
- password / **Password**(const std::string&) (p. 361)
- keypassword / **KeyPassword**(const std::string&) (p. 356)
- keysize / **KeySize**(int) (p. 358)
- certificatelifetime / **CertificateLifeTime**(const Period&) (p. 350)
- slcs / **SLCS**(const URL&) (p. 362)
- storedirectory / **StoreDirectory**(const std::string&) (p. 363)
- idpname / **IdPName**(const std::string&) (p. 354)

where the first term is the name of the attribute used in the configuration file, and the second term is the associated setter method (for more information about a given attribute see the description of the setter method).

The configuration file should have a INI-style format and the **IniConfig** (p. 178) class will thus be used to parse the file. The above mentioned attributes should be placed in the common section. Another section is also valid in the configuration file, which is the alias section. Here it is possible to define aliases representing one or multiple services. These aliases can be used in the **AddServices**(const std::list<std::string>&, **ServiceType**) (p. 346) and **AddServices**(const std::list<std::string>&, const std::list<std::string>&, **ServiceType**) (p. 345) methods.

The **UserConfig** (p. 340) class also provides a method **InitializeCredentials**() (p. 354) for locating user credentials by searching in different standard locations. The **CredentialsFound**() (p. 353) method can be used to test if locating the credentials succeeded.

6.277.2 Constructor & Destructor Documentation

6.277.2.1 Arc::UserConfig::UserConfig (initializeCredentialsType initializeCredentials = initializeCredentialsType ())

Create a **UserConfig** (p. 340) object.

The **UserConfig** (p. 340) object created by this constructor initializes only default values, and if specified by the *initializeCredentials* boolean credentials will be tried initialized using the **InitializeCredentials**() (p. 354) method. The object is only non-valid if initialization of credentials fails which can be checked with the **operator bool**() (p. 360) method.

Parameters

initializeCredentials is a optional boolean indicating if the **InitializeCredentials**() (p. 354) method should be invoked, the default is `true`.

See also

InitializeCredentials() (p. 354)
operator bool() (p. 360)

6.277.2.2 `Arc::UserConfig::UserConfig (const std::string & conffile, initializeCredentialsType initializeCredentials = initializeCredentialsType (), bool loadSysConfig = true)`

Create a **UserConfig** (p. 340) object.

The **UserConfig** (p. 340) object created by this constructor will, if specified by the *loadSysConfig* boolean, first try to load the system configuration file by invoking the **LoadConfigurationFile()** (p. 358) method, and if this fails a WARNING is reported. Then the configuration file passed will be tried loaded using the before mentioned method, and if this fails an ERROR is reported, and the created object will be non-valid. Note that if the passed file path is empty the example configuration will be tried copied to the default configuration file path specified by DEFAULTCONFIG. If the example file cannot be copied one or more WARNING messages will be reported and no configuration will be loaded. If loading the configurations file succeeded and if *initializeCredentials* is `true` then credentials will be initialized using the **InitializeCredentials()** (p. 354) method, and if no valid credentials are found the created object will be non-valid.

Parameters

*conf*file is the path to a INI-configuration file.

initializeCredentials is a boolean indicating if credentials should be initialized, the default is `true`.

loadSysConfig is a boolean indicating if the system configuration file should be loaded aswell, the default is `true`.

See also

LoadConfigurationFile(const std::string&, bool) (p. 358)

InitializeCredentials() (p. 354)

operator bool() (p. 360)

SYSCONFIG (p. 368)

EXAMPLECONFIG (p. 367)

6.277.2.3 `Arc::UserConfig::UserConfig (const std::string & conffile, const std::string & jfile, initializeCredentialsType initializeCredentials = initializeCredentialsType (), bool loadSysConfig = true)`

Create a **UserConfig** (p. 340) object.

The **UserConfig** (p. 340) object created by this constructor does only differ from the **UserConfig(const std::string&, bool, bool)** constructor in that it is possible to pass the path of the job list file directly to this constructor. If the job list file *joblistfile* is empty, the behaviour of this constructor is exactly the same as the before mentioned, otherwise the job list file will be initialized by invoking the setter method **JobListFile(const std::string&)** (p. 355). If it fails the created object will be non-valid, otherwise the specified configuration file *conf*file will be loaded with the *ignoreJobListFile* argument set to `true`.

Parameters

*conf*file is the path to a INI-configuration file

jfile is the path to a (non-)existing job list file.

initializeCredentials is a boolean indicating if credentials should be initialized, the default is `true`.

loadSysConfig is a boolean indicating if the system configuration file should be loaded aswell, the default is `true`.

See also

JobListFile(const std::string&) (p. 355)

LoadConfigurationFile(const std::string&, bool) (p. 358)

InitializeCredentials() (p. 354)

operator bool() (p. 360)

6.277.2.4 Arc::UserConfig::UserConfig (const long int & ptraddr)

Language binding constructor.

The passed long int should be a pointer address to a **UserConfig** (p. 340) object, and this address is then casted into this **UserConfig** (p. 340) object.

Parameters

ptraddr is an memory address to a **UserConfig** (p. 340) object.

6.277.3 Member Function Documentation

6.277.3.1 void Arc::UserConfig::AddBartender (const URL & url) [inline]

Set bartenders, used to contact Chelonia.

Takes as input a Bartender **URL** (p. 330) and adds this to the list of bartenders.

Parameters

url is a **URL** (p. 330) to be added to the list of bartenders.

See also

Bartender(const std::list<URL>&)

Bartender() const (p. 347)

6.277.3.2 bool Arc::UserConfig::AddServices (const std::list< std::string > & selected, const std::list< std::string > & rejected, ServiceType st)

Add selected and rejected services.

The only diffence in behaviour of this method compared to the **AddServices(const std::list<std::string>&, ServiceType)** (p. 346) method is the input parameters and the format these parameters should follow. Instead of having an optional '-' in front of the string selected and rejected services should be specified in the two different arguments.

Two attributes are indirectly associated with this setter method 'defaultservices' and 'rejectservices'. The values specified with the 'defaultservices' attribute will be added to the list of selected services, and likewise with the 'rejectservices' attribute.

Parameters

selected is a list of services which will be added to the selected services of this object.

rejected is a list of services which will be added to the rejected services of this object.

st specifies the ServiceType of the services to add.

Returns

This method return `false` in case an alias cannot be resolved. In any other case `true` is returned.

See also

AddServices(const std::list<std::string>&, ServiceType) (p. 346)
GetSelectedServices() (p. 353)
GetRejectedServices() (p. 353)
ClearSelectedServices() (p. 352)
ClearRejectedServices() (p. 352)
LoadConfigurationFile() (p. 358)

6.277.3.3 bool Arc::UserConfig::AddServices (const std::list< std::string > & services, ServiceType st)

Add selected and rejected services.

This method adds selected services and adds services to reject from the specified list *services*, which contains string objects. The syntax of a single element in the list must be expressed in the following two formats:

$$[-] < flavour > : < service_url > | [-] < alias >$$

where the optional '-' indicate that the service should be added to the private list of services to reject. In the first format the <flavour> part indicates the type of ACC plugin to use when contacting the service, which is specified by the **URL** (p. 330) <service_url>, and in the second format the <alias> part specifies a alias defined in a parsed configuration file, note that the alias must not contain any of the charaters ':', '.', ' ' or '\t'. If a alias cannot be resolved an ERROR will be reported to the logger and the method will return false. If a element in the list *services* cannot be parsed an ERROR will be reported, and the element is skipped.

Two attributes are indirectly associated with this setter method 'defaultservices' and 'rejectservices'. The values specified with the 'defaultservices' attribute will be added to the list of selected services, and likewise with the 'rejectservices' attribute.

Parameters

services is a list of services to either select or reject.

st indicates the type of the specfied services.

Returns

This method returns `false` in case an alias cannot be resolved. In any other case `true` is returned.

See also

AddServices(const std::string&, const std::string&, ServiceType)
GetSelectedServices() (p. 353)
GetRejectedServices() (p. 353)
ClearSelectedServices() (p. 352)
ClearRejectedServices() (p. 352)
LoadConfigurationFile() (p. 358)

6.277.3.4 void Arc::UserConfig::ApplyToConfig (BaseConfig & *ccfg*) const

Apply credentials to **BaseConfig** (p. 59).

This methods sets the **BaseConfig** (p. 59) credentials to the credentials contained in this object. It also passes user defined configuration overlay if any.

See also

InitializeCredentials() (p. 354)

CredentialsFound() (p. 353)

BaseConfig (p. 59)

Parameters

ccfg a **BaseConfig** (p. 59) object which will configured with the credentials of this object.

6.277.3.5 bool Arc::UserConfig::Bartender (const std::vector< URL > & *urls*) [inline]

Set bartenders, used to contact Chelonia.

Takes as input a vector of Bartender URLs.

The attribute associated with this setter method is 'bartender'.

Parameters

urls is a list of **URL** (p. 330) object to be set as bartenders.

Returns

This method always returns `true`.

See also

AddBartender(const URL&) (p. 345)

Bartender() const (p. 347)

6.277.3.6 const std::vector<URL>& Arc::UserConfig::Bartender () const [inline]

Get bartenders.

Returns a list of Bartender URLs

Returns

The list of bartender **URL** (p. 330) objects is returned.

See also

Bartender(const std::list<URL>&)

AddBartender(const URL&) (p. 345)

6.277.3.7 `bool Arc::UserConfig::Broker (const std::string & name)`

Set broker to use in target matching.

The string passed to this method should be in the format:

$$< name > [: < argument >]$$

where the `<name>` is the name of the broker and cannot contain any `'.'`, and the optional `<argument>` should contain arguments which should be passed to the broker.

Two attributes are associated with this setter method `'brokername'` and `'brokerarguments'`.

Parameters

name the broker name and argument specified in the format given above.

Returns

This method allways returns `true`.

See also

Broker (p. 62)

Broker(const std::string&, const std::string&) (p. 348)

Broker() const (p. 349)

DEFAULT_BROKER (p. 367)

6.277.3.8 `bool Arc::UserConfig::Broker (const std::string & name, const std::string & argument) [inline]`

Set broker to use in target matching.

As opposed to the **Broker(const std::string&)** (p. 348) method this method sets broker name and arguments directly from the passed two arguments.

Two attributes are associated with this setter method `'brokername'` and `'brokerarguments'`.

Parameters

name is the name of the broker.

argument is the arguments of the broker.

Returns

This method always returns `true`.

See also

Broker (p. 62)

Broker(const std::string&) (p. 348)

Broker() const (p. 349)

DEFAULT_BROKER (p. 367)

6.277.3.9 `const std::pair<std::string, std::string>& Arc::UserConfig::Broker () const [inline]`

Get the broker and corresponding arguments.

The returned pair contains the broker name as the first component and the argument as the second.

See also

Broker(const std::string&) (p. 348)

Broker(const std::string&, const std::string&) (p. 348)

DEFAULT_BROKER (p. 367)

6.277.3.10 `bool Arc::UserConfig::CACertificatePath (const std::string & newCACertificatePath) [inline]`

Set CA-certificate path.

The path to the file containing CA-certificate will be set when calling this method. This configuration parameter is deprecated - use CACertificatesDirectory instead. Only arcslcs uses it.

The attribute associated with this setter method is 'cacertificatepath'.

Parameters

newCACertificatePath is the path to the CA-certificate.

Returns

This method always returns `true`.

See also

CACertificatePath() const (p. 349)

6.277.3.11 `const std::string& Arc::UserConfig::CACertificatePath () const [inline]`

Get path to CA-certificate.

Retrieve the path to the file containing CA-certificate. This configuration parameter is deprecated.

Returns

The path to the CA-certificate is returned.

See also

CACertificatePath(const std::string&) (p. 349)

6.277.3.12 `bool Arc::UserConfig::CACertificatesDirectory (const std::string & newCACertificatesDirectory) [inline]`

Set path to CA-certificate directory.

The path to the directory containing CA-certificates will be set when calling this method. Note that the **InitializeCredentials()** (p. 354) method will also try to set this path, by searching in different locations.

The attribute associated with this setter method is 'cacertificatesdirectory'.

Parameters

newCACertificatesDirectory is the path to the CA-certificate directory.

Returns

This method always returns `true`.

See also

InitializeCredentials() (p. 354)
CredentialsFound() const (p. 353)
CACertificatesDirectory() const (p. 350)

6.277.3.13 `const std::string& Arc::UserConfig::CACertificatesDirectory () const [inline]`

Get path to CA-certificate directory.

Retrieve the path to the CA-certificate directory.

Returns

The path to the CA-certificate directory is returned.

See also

InitializeCredentials() (p. 354)
CredentialsFound() const (p. 353)
CACertificatesDirectory(const std::string&) (p. 349)

6.277.3.14 `bool Arc::UserConfig::CertificateLifeTime (const Period & newCertificateLifeTime) [inline]`

Set certificate life time.

Sets lifetime of user certificate which will be obtained from Short Lived Credentials **Service** (p. 288).

The attribute associated with this setter method is 'certificatelifetime'.

Parameters

newCertificateLifeTime is the life time of a certificate, as a **Period** (p. 249) object.

Returns

This method always returns `true`.

See also

CertificateLifeTime() const (p. 351)

6.277.3.15 `const Period& Arc::UserConfig::CertificateLifeTime () const [inline]`

Get certificate life time.

Gets lifetime of user certificate which will be obtained from Short Lived Credentials **Service** (p. 288).

Returns

The certificate life time is returned as a **Period** (p. 249) object.

See also

CertificateLifeTime(const Period&) (p. 350)

6.277.3.16 `bool Arc::UserConfig::CertificatePath (const std::string & newCertificatePath) [inline]`

Set path to certificate.

The path to user certificate will be set by this method. The path to the corresponding key can be set with the **KeyPath(const std::string&)** (p. 357) method. Note that the **InitializeCredentials()** (p. 354) method will also try to set this path, by searching in different locations.

The attribute associated with this setter method is 'certificatepath'.

Parameters

newCertificatePath is the path to the new certificate.

Returns

This method always returns `true`.

See also

InitializeCredentials() (p. 354)
CredentialsFound() const (p. 353)
CertificatePath() const (p. 351)
KeyPath(const std::string&) (p. 357)

6.277.3.17 `const std::string& Arc::UserConfig::CertificatePath () const [inline]`

Get path to certificate.

The path to the cerficate is returned when invoking this method.

Returns

The certificate path is returned.

See also

InitializeCredentials() (p. 354)
CredentialsFound() const (p. 353)
CertificatePath(const std::string&) (p. 351)
KeyPath() const (p. 357)

6.277.3.18 void Arc::UserConfig::ClearRejectedServices (ServiceType *st*)

Clear rejected services with specified ServiceType.

Calling this method will cause the internally stored rejected services with the ServiceType *st* to be cleared.

See also

ClearRejectedServices() (p. 352)

ClearSelectedServices(ServiceType) (p. 352)

AddServices(const std::list<std::string>&, ServiceType) (p. 346)

AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType) (p. 345)

GetRejectedServices() (p. 353)

6.277.3.19 void Arc::UserConfig::ClearRejectedServices ()

Clear selected services.

Calling this method will cause the internally stored rejected services to be cleared.

See also

ClearRejectedServices(ServiceType) (p. 352)

ClearSelectedServices() (p. 352)

AddServices(const std::list<std::string>&, ServiceType) (p. 346)

AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType) (p. 345)

GetRejectedServices() (p. 353)

6.277.3.20 void Arc::UserConfig::ClearSelectedServices ()

Clear selected services.

Calling this method will cause the internally stored selected services to be cleared.

See also

ClearSelectedServices(ServiceType) (p. 352)

ClearRejectedServices() (p. 352)

AddServices(const std::list<std::string>&, ServiceType) (p. 346)

AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType) (p. 345)

GetSelectedServices() (p. 353)

6.277.3.21 void Arc::UserConfig::ClearSelectedServices (ServiceType *st*)

Clear selected services with specified ServiceType.

Calling this method will cause the internally stored selected services with the ServiceType *st* to be cleared.

See also

ClearSelectedServices() (p. 352)

ClearRejectedServices(ServiceType) (p. 352)

AddServices(const std::list<std::string>&, ServiceType) (p. 346)

AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType) (p. 345)

GetSelectedServices() (p. 353)

6.277.3.22 bool Arc::UserConfig::CredentialsFound () const [inline]

Validate credential location.

Valid credentials consists of a combination of a path to existing CA-certificate directory and either a path to existing proxy or a path to existing user key/certificate pair. If valid credentials are found this method returns `true`, otherwise `false` is returned.

Returns

`true` if valid credentials are found, otherwise `false`.

See also

InitializeCredentials() (p. 354)

6.277.3.23 const URLListMap& Arc::UserConfig::GetRejectedServices (ServiceType st) const

Get rejected services.

Get the rejected services with the ServiceType specified by *st*.

Parameters

st specifies which ServiceType should be returned by the method.

Returns

The rejected services is returned.

See also

AddServices(const std::list<std::string>&, ServiceType) (p. 346)

AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType) (p. 345)

GetSelectedServices(ServiceType)

ClearRejectedServices() (p. 352)

6.277.3.24 const URLListMap& Arc::UserConfig::GetSelectedServices (ServiceType st) const

Get selected services.

Get the selected services with the ServiceType specified by *st*.

Parameters

st specifies which ServiceType should be returned by the method.

Returns

The selected services is returned.

See also

AddServices(const std::list<std::string>&, ServiceType) (p. 346)

AddServices(const std::list<std::string>&, const std::list<std::string>&, ServiceType) (p. 345)

GetRejectedServices(ServiceType) const (p. 353)

ClearSelectedServices() (p. 352)

6.277.3.25 `bool Arc::UserConfig::IdPName (const std::string & name) [inline]`

Set IdP name.

Sets Identity Provider name (Shibboleth) to which user belongs. It is used for contacting Short Lived Certificate **Service** (p. 288).

The attribute associated with this setter method is 'idpname'.

Parameters

name is the new IdP name.

Returns

This method always returns `true`.

See also**6.277.3.26** `const std::string& Arc::UserConfig::IdPName () const [inline]`

Get IdP name.

Gets Identity Provider name (Shibboleth) to which user belongs.

Returns

The IdP name

See also

IdPName(const std::string&) (p. 354)

6.277.3.27 `void Arc::UserConfig::InitializeCredentials ()`

Initialize user credentials.

The location of the user credentials will be tried located when calling this method and stored internally when found. The method searches in different locations. First the user proxy or the user key/certificate pair is tried located in the following order:

- Proxy path specified by the environment variable `X509_USER_PROXY`
- Key/certificate path specified by the environment `X509_USER_KEY` and `X509_USER_CERT`
- Proxy path specified in either configuration file passed to the constructor or explicitly set using the setter method **ProxyPath(const std::string&)** (p. 361)
- Key/certificate path specified in either configuration file passed to the constructor or explicitly set using the setter methods **KeyPath(const std::string&)** (p. 357) and **CertificatePath(const std::string&)** (p. 351)
- `ProxyPath` with file name `x509up_u` concatenated with the user ID located in the OS temporary directory.

If the proxy or key/certificate pair have been explicitly specified only the specified path(s) will be tried, and if not found a **ERROR** is reported. If the proxy or key/certificate have not been specified and it is not located in the temporary directory a **WARNING** will be reported and the host key/certificate pair is tried and then the Globus key/certificate pair and a **ERROR** will be reported if not found in any of these locations.

Together with the proxy and key/certificate pair, the path to the directory containing CA certificates is also tried located when invoking this method. The directory will be tried located in the following order:

- Path specified by the `X509_CERT_DIR` environment variable.
- Path explicitly specified either in a parsed configuration file using the `cacertificatecirectory` or by using the setter method **CACertificatesDirectory()** (p. 349).
- Path created by concatenating the output of `User::Home()` with `'.globus'` and `'certificates'` separated by the directory delimiter.
- Path created by concatenating the output of `Glib::get_home_dir()` with `'.globus'` and `'certificates'` separated by the directory delimiter.
- Path created by concatenating the output of **ArcLocation::Get()** (p. 50), with `'etc'` and `'certificates'` separated by the directory delimiter.
- Path created by concatenating the output of **ArcLocation::Get()** (p. 50), with `'etc'`, `'grid-security'` and `'certificates'` separated by the directory delimiter.
- Path created by concatenating the output of **ArcLocation::Get()** (p. 50), with `'share'` and `'certificates'` separated by the directory delimiter.
- Path created by concatenating `'etc'`, `'grid-security'` and `'certificates'` separated by the directory delimiter.

If the CA certificate directory have explicitly been specified and the directory does not exist a **ERROR** is reported. If none of the directories above does not exist a **ERROR** is reported.

See also

CredentialsFound() (p. 353)
ProxyPath(const std::string&) (p. 361)
KeyPath(const std::string&) (p. 357)
CertificatePath(const std::string&) (p. 351)
CACertificatesDirectory(const std::string&) (p. 349)

6.277.3.28 bool Arc::UserConfig::JobListFile (const std::string & path)

Set path to job list file.

The method takes a path to a file which will be used as the job list file for storing and reading job information. If the specified path *path* does not exist a empty job list file will be tried created. If creating the job list file in any way fails *false* will be returned and a **ERROR** message will be reported. Otherwise *true* is returned. If the directory containing the file does not exist, it will be tried created. The method will also return *false* if the file is not a regular file.

The attribute associated with this setter method is `'joblist'`.

Parameters

path the path to the job list file.

Returns

If the job list file is a regular file or if it can be created *true* is returned, otherwise *false* is returned.

See also

JobListFile() const (p. 356)

6.277.3.29 const std::string& Arc::UserConfig::JobListFile () const [inline]

Get a reference to the path of the job list file.

The job list file is used to store and fetch information about submitted computing jobs to computing services. This method will return the path to the specified job list file.

Returns

The path to the job list file is returned.

See also

JobListFile(const std::string&) (p. 355)

6.277.3.30 bool Arc::UserConfig::KeyPassword (const std::string & newKeyPassword) [inline]

Set password for generated key.

Set password to be used to encode private key of credentials obtained from Short Lived Credentials **Service** (p. 288).

The attribute associated with this setter method is 'keypassword'.

Parameters

newKeyPassword is the new password to the key.

Returns

This method always returns *true*.

See also

KeyPassword() const (p. 356)

KeyPath(const std::string&) (p. 357)

KeySize(int) (p. 358)

6.277.3.31 const std::string& Arc::UserConfig::KeyPassword () const [inline]

Get password for generated key.

Get password to be used to encode private key of credentials obtained from Short Lived Credentials **Service** (p. 288).

Returns

The key password is returned.

See also

KeyPassword(const std::string&) (p. 356)

KeyPath() const (p. 357)

KeySize() const (p. 358)

6.277.3.32 bool Arc::UserConfig::KeyPath (const std::string & newKeyPath) [inline]

Set path to key.

The path to user key will be set by this method. The path to the corresponding certificate can be set with the **CertificatePath(const std::string&)** (p. 351) method. Note that the **InitializeCredentials()** (p. 354) method will also try to set this path, by searching in different locations.

The attribute associated with this setter method is 'keypath'.

Parameters

newKeyPath is the path to the new key.

Returns

This method always returns `true`.

See also

InitializeCredentials() (p. 354)

CredentialsFound() const (p. 353)

KeyPath() const (p. 357)

CertificatePath(const std::string&) (p. 351)

KeyPassword(const std::string&) (p. 356)

KeySize(int) (p. 358)

6.277.3.33 const std::string& Arc::UserConfig::KeyPath () const [inline]

Get path to key.

The path to the key is returned when invoking this method.

Returns

The path to the user key is returned.

See also

InitializeCredentials() (p. 354)

CredentialsFound() const (p. 353)

KeyPath(const std::string&) (p. 357)

CertificatePath() const (p. 351)

KeyPassword() const (p. 356)

KeySize() const (p. 358)

6.277.3.34 int Arc::UserConfig::KeySize () const [inline]

Get key size.

Get size/strengt of private key of credentials obtained from Short Lived Credentials **Service** (p. 288).

Returns

The key size, as an integer, is returned.

See also

KeySize(int) (p. 358)

KeyPath() const (p. 357)

KeyPassword() const (p. 356)

6.277.3.35 bool Arc::UserConfig::KeySize (int *newKeySize*) [inline]

Set key size.

Set size/strengt of private key of credentials obtained from Short Lived Credentials **Service** (p. 288).

The attribute associated with this setter method is 'keysize'.

Parameters

newKeySize is the size, an an integer, of the key.

Returns

This method always returns `true`.

See also

KeySize() const (p. 358)

KeyPath(const std::string&) (p. 357)

KeyPassword(const std::string&) (p. 356)

6.277.3.36 bool Arc::UserConfig::LoadConfigurationFile (const std::string & *confFile*, bool *ignoreJobListFile* = *true*)

Load specified configuration file.

The configuration file passed is parsed by this method by using the **IniConfig** (p. 178) class. If the parsing is unsuccessful a WARNING is reported.

The format of the configuration file should follow that of INI, and every attribute present in the file is only allowed once, if otherwise a WARNING will be reported. The file can contain at most two sections, one named common and the other name alias. If other sections exist a WARNING will be reported. Only the following attributes is allowed in the common section of the configuration `file`:

- certificatepath (**CertificatePath(const std::string&)** (p. 351))
- keypath (**KeyPath(const std::string&)** (p. 357))
- proxypath (**ProxyPath(const std::string&)** (p. 361))

- cacertificatesdirectory (**CACertificatesDirectory**(const std::string&) (p. 349))
- cacertificatepath (**CACertificatePath**(const std::string&) (p. 349))
- timeout (**Timeout**(int) (p. 364))
- joblist (**JobListFile**(const std::string&) (p. 355))
- defaultservices (**AddServices**(const std::list<std::string>&, const std::list<std::string>&, **ServiceType**) (p. 345))
- rejectservices (**AddServices**(const std::list<std::string>&, const std::list<std::string>&, **ServiceType**) (p. 345))
- verbosity (**Verbosity**(const std::string&) (p. 366))
- brokername (**Broker**(const std::string&) (p. 348) or **Broker**(const std::string&, const std::string&) (p. 348))
- brokerarguments (**Broker**(const std::string&) (p. 348) or **Broker**(const std::string&, const std::string&) (p. 348))
- bartender (**Bartender**(const std::list<URL>&))
- vomsserverpath (**VOMSServerPath**(const std::string&) (p. 366))
- username (**UserName**(const std::string&) (p. 365))
- password (**Password**(const std::string&) (p. 361))
- keypassword (**KeyPassword**(const std::string&) (p. 356))
- keysize (**KeySize**(int) (p. 358))
- certificatelifetime (**CertificateLifeTime**(const Period&) (p. 350))
- slcs (**SLCS**(const URL&) (p. 362))
- storedirectory (**StoreDirectory**(const std::string&) (p. 363))
- idpname (**IdPName**(const std::string&) (p. 354))

where the method in parentheses is the associated setter method. If other attributes exist in the common section a WARNING will be reported for each of these attributes. In the alias section aliases can be defined, and should represent a selection of services. The alias can then be referred to by input to the **AddServices**(const std::list<std::string>&, **ServiceType**) (p. 346) and **AddServices**(const std::list<std::string>&, const std::list<std::string>&, **ServiceType**) (p. 345) methods. An alias can not contain any of the characters ' ', ':', ' ' or '\t' and should be defined as follows:

< alias_name >=< service_type >:< flavour >:< service_url > | < alias_ref > [...]

where <alias_name> is the name of the defined alias, <service_type> is the service type in lower case, <flavour> is the type of middleware plugin to use, <service_url> is the **URL** (p. 330) which should be used to contact the service and <alias_ref> is another defined alias. The parsed aliases will be stored internally and resolved when needed. If an alias already exists, and another alias with the same name is parsed then this other alias will overwrite the existing alias.

Parameters

*conf*file is the path to the configuration file.

ignoreJobListFile is a optional boolean which indicates whether the joblistfile attribute in the configuration file should be ignored. Default is to ignored it (`true`).

Returns

If loading the configuration file succeeds `true` is returned, otherwise `false` is returned.

See also

SaveToFile() (p. 362)

6.277.3.37 **Arc::UserConfig::operator bool (void) const [inline]**

Check for validity.

The validity of an object created from this class can be checked using this casting operator. An object is valid if the constructor did not encounter any errors.

See also

operator!() (p. 360)

6.277.3.38 **bool Arc::UserConfig::operator! (void) const [inline]**

Check for non-validity.

See **operator bool()** (p. 360) for a description.

See also

operator bool() (p. 360)

6.277.3.39 **const std::string& Arc::UserConfig::OverlayFile () const [inline]**

Get path to configuration overlay file.

Returns

The overlay file path

See also

OverlayFile(const std::string&) (p. 360)

6.277.3.40 **bool Arc::UserConfig::OverlayFile (const std::string & path) [inline]**

Set path to configuration overlay file.

Content of specified file is a backdoor to configuration XML generated from information stored in this class. The content of file is passed to **BaseConfig** (p. 59) class in **ApplyToConfig(BaseConfig&)** then merged with internal configuration XML representation. This feature is meant for quick prototyping/testing/tuning of functionality without rewriting code. It is meant for developers and most users won't need it.

The attribute associated with this setter method is 'overlayfile'.

Parameters

path is the new overlay file path.

Returns

This method always returns `true`.

See also**6.277.3.41 bool Arc::UserConfig::Password (const std::string & newPassword) [inline]**

Set password.

Set password which is used for requesting credentials from Short Lived Credentials **Service** (p. 288).

The attribute associated with this setter method is 'password'.

Parameters

newPassword is the new password to set.

Returns

This method always returns `true`.

See also

Password() const (p. 361)

6.277.3.42 const std::string& Arc::UserConfig::Password () const [inline]

Get password.

Get password which is used for requesting credentials from Short Lived Credentials **Service** (p. 288).

Returns

The password is returned.

See also

Password(const std::string&) (p. 361)

6.277.3.43 bool Arc::UserConfig::ProxyPath (const std::string & newProxyPath) [inline]

Set path to user proxy.

This method will set the path of the user proxy. Note that the **InitializeCredentials()** (p. 354) method will also try to set this path, by searching in different locations.

The attribute associated with this setter method is 'proxypath'

Parameters

newProxyPath is the path to a user proxy.

Returns

This method always returns `true`.

See also

InitializeCredentials() (p. 354)

CredentialsFound() (p. 353)

ProxyPath() const (p. 362)

6.277.3.44 `const std::string& Arc::UserConfig::ProxyPath () const` **[inline]**

Get path to user proxy.

Retrieve path to user proxy.

Returns

Returns the path to the user proxy.

See also

ProxyPath(const std::string&) (p. 361)

6.277.3.45 `bool Arc::UserConfig::SaveToFile (const std::string & filename) const`

Save to INI file.

This method will save the object data as a INI file. The saved file can be loaded with the `LoadConfigurationFile` method.

Parameters

filename the name of the file which the data will be saved to.

Returns

`false` if unable to get handle on file, otherwise `true` is returned.

See also

LoadConfigurationFile() (p. 358)

6.277.3.46 `bool Arc::UserConfig::SLCS (const URL & newSLCS)` **[inline]**

Set the **URL** (p. 330) to the Short Lived Certificate **Service** (p. 288) (SLCS).

The attribute associated with this setter method is 'slcs'.

Parameters

newSLCS is the **URL** (p. 330) to the SLCS

Returns

This method always returns `true`.

See also

`SLCS()` `const` (p. 363)

6.277.3.47 `const URL& Arc::UserConfig::SLCS () const [inline]`

Get the **URL** (p. 330) to the Short Lived Certificate **Service** (p. 288) (SLCS).

Returns

The SLCS is returned.

See also

`SLCS(const URL&)` (p. 362)

6.277.3.48 `bool Arc::UserConfig::StoreDirectory (const std::string & newStoreDirectory) [inline]`

Set store directory.

Sets directory which will be used to store credentials obtained from Short Lived **Credential** (p. 89) Service.
The attribute associated with this setter method is 'storedirectory'.

Parameters

newStoreDirectory is the path to the store directory.

Returns

This method always returns `true`.

See also**6.277.3.49** `const std::string& Arc::UserConfig::StoreDirectory () const [inline]`

Get store directory.

Sets directory which is used to store credentials obtained from Short Lived **Credential** (p. 89) Service.

Returns

The path to the store directory is returned.

See also

`StoreDirectory(const std::string&)` (p. 363)

6.277.3.50 int Arc::UserConfig::Timeout () const [inline]

Get timeout.

Returns the timeout in seconds.

Returns

timeout in seconds.

See also

Timeout(int) (p. 364)

DEFAULT_TIMEOUT (p. 367)

6.277.3.51 bool Arc::UserConfig::Timeout (int *newTimeout*)

Set timeout.

When communicating with a service the timeout specifies how long, in seconds, the communicating instance should wait for a response. If the response have not been recieved before this period in time, the connection is typically dropped, and an error will be reported.

This method will set the timeout to the specified integer. If the passed integer is less than or equal to 0 then `false` is returned and the timeout will not be set, otherwise `true` is returned and the timeout will be set to the new value.

The attribute associated with this setter method is 'timeout'.

Parameters

newTimeout the new timeout value in seconds.

Returns

`false` in case *newTimeout* <= 0, otherwise `true`.

See also

Timeout() const (p. 364)

DEFAULT_TIMEOUT (p. 367)

6.277.3.52 const std::string& Arc::UserConfig::UserName () const [inline]

Get user-name.

Get username which is used for requesting credentials from Short Lived Credentials **Service** (p. 288).

Returns

The username is returned.

See also

UserName(const std::string&) (p. 365)

6.277.3.53 bool Arc::UserConfig::UserName (const std::string & *name*) [inline]

Set user-name for SLCS.

Set username which is used for requesting credentials from Short Lived Credentials **Service** (p. 288).

The attribute associated with this setter method is 'username'.

Parameters

name is the name of the user.

Returns

This method always return true.

See also

UserName() const (p. 364)

6.277.3.54 const std::string& Arc::UserConfig::UtilsDirPath () const [inline]

Get path to directory storing utility files for DataPoints.

Returns

The utils dir path

See also

UtilsDirPath(const std::string&) (p. 365)

6.277.3.55 bool Arc::UserConfig::UtilsDirPath (const std::string & *dir*)

Set path to directory storing utility files for DataPoints.

Some DataPoints can store information on remote services in local files. This method sets the path to the directory containing these files. For example arc* tools set it to ARCUSERDIRECTORY and A-REX sets it to the control directory. The directory is created if it does not exist.

Parameters

path is the new utils dir path.

Returns

This method always returns `true`.

6.277.3.56 const std::string& Arc::UserConfig::Verbosity () const [inline]

Get the user selected level of verbosity.

The string representation of the verbosity level specified by the user is returned when calling this method. If the user have not specified the verbosity level the empty string will be referenced.

Returns

the verbosity level, or empty if it has not been set.

See also

Verbosity(const std::string&) (p. 366)

6.277.3.57 bool Arc::UserConfig::Verbosity (const std::string & newVerbosity)

Set verbosity.

The verbosity will be set when invoking this method. If the string passed cannot be parsed into a corresponding LogLevel, using the function a WARNING is reported and `false` is returned, otherwise `true` is returned.

The attribute associated with this setter method is 'verbosity'.

Returns

`true` in case the verbosity could be set to a allowed LogLevel, otherwise `false`.

See also

Verbosity() const (p. 365)

6.277.3.58 bool Arc::UserConfig::VOMSServerPath (const std::string & path) [inline]

Set path to file containing VOMS configuration.

Set path to file which contains list of VOMS services and associated configuration parameters needed to contact those services. It is used by arcproxy.

The attribute associated with this setter method is 'vomsserverpath'.

Parameters

path the path to VOMS configuration file

Returns

This method always return true.

See also

VOMSServerPath() const (p. 366)

6.277.3.59 const std::string& Arc::UserConfig::VOMSServerPath () const [inline]

Get path to file containing VOMS configuration.

Get path to file which contains list of VOMS services and associated configuration parameters.

Returns

The path to VOMS configuration file is returned.

See also

VOMSServerPath(const std::string&) (p. 366)

6.277.4 Field Documentation

6.277.4.1 `const std::string Arc::UserConfig::ARCUSERDIRECTORY` `[static]`

Path to ARC user home directory.

The *ARCUSERDIRECTORY* variable is the path to the ARC home directory of the current user. This path is created using the `User::Home()` method.

See also

`User::Home()`

6.277.4.2 `const std::string Arc::UserConfig::DEFAULT_BROKER` `[static]`

Default broker.

The *DEFAULT_BROKER* specifies the name of the broker which should be used in case no broker is explicitly chosen.

See also

Broker (p. 62)

Broker(const std::string&) (p. 348)

Broker(const std::string&, const std::string&) (p. 348)

Broker() const (p. 349)

6.277.4.3 `const int Arc::UserConfig::DEFAULT_TIMEOUT = 20` `[static]`

Default timeout in seconds.

The *DEFAULT_TIMEOUT* specifies interval which will be used in case no timeout interval have been explicitly specified. For a description about timeout see **Timeout(int)** (p. 364).

See also

Timeout(int) (p. 364)

Timeout() const (p. 364)

6.277.4.4 `const std::string Arc::UserConfig::DEFAULTCONFIG` `[static]`

Path to default configuration file.

The *DEFAULTCONFIG* variable is the path to the default configuration file used in case no configuration file have been specified. The path is created from the *ARCUSERDIRECTORY* object.

6.277.4.5 `const std::string Arc::UserConfig::EXAMPLECONFIG` `[static]`

Path to example configuration.

The *EXAMPLECONFIG* variable is the path to the example configuration file.

6.277.4.6 `const std::string Arc::UserConfig::SYSCONFIG` `[static]`

Path to system configuration.

The *SYSCONFIG* variable is the path to the system configuration file. This variable is only equal to *SYSCONFIGARCLOC* if ARC is installed in the root (highly unlikely).

6.277.4.7 `const std::string Arc::UserConfig::SYSCONFIGARCLOC` `[static]`

Path to system configuration at ARC location.

The *SYSCONFIGARCLOC* variable is the path to the system configuration file which reside at the ARC installation location.

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

- UserConfig.h

6.278 `Arc::UsernameToken` Class Reference

Interface for manipulation of WS-Security according to Username Token **Profile** (p. 264).

```
#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)

6.278.1 Detailed Description

Interface for manipulation of WS-Security according to Username Token **Profile** (p. 264).

6.278.2 Member Enumeration Documentation

6.278.2.1 `enum Arc::UsernameToken::PasswordType`

SOAP header element

6.278.3 Constructor & Destructor Documentation

6.278.3.1 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.

6.278.3.2 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. 368) wsu:ID="...">

pwdtype <wsse:Password Type="...">...</wsse:Password>

6.278.3.3 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:Use:Username>...</wsse:Use:Username>

mac if derived key is meant to be used for **Message** (p. 216) Authentication Code

iteration <wsse11:Iteration>...</wsse11:Iteration>

6.278.4 Member Function Documentation

6.278.4.1 bool Arc::UsernameToken::Authenticate (const std::string & *password*, std::string & *derived_key*)

Checks parsed/generated token against specified password. If token is meant to be used for deriving a key then key is returned in *derived_key*. In that case authentication is performed outside of **UsernameToken** (p. 368) class using obtained *derived_key*.

6.278.4.2 bool Arc::UsernameToken::Authenticate (std::istream & *password*, std::string & *derived_key*)

Checks parsed token against password stored in specified stream. If token is meant to be used for deriving a key then key is returned in *derived_key*

6.278.4.3 Arc::UsernameToken::operator bool (void)

Returns true of constructor succeeded

6.278.4.4 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

6.279 Arc::UserSwitch Class Reference

```
#include <User.h>
```

6.279.1 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_setxid. That bug causes lockup of seteuid() function if racing with fork. To avoid this problem the lock mentioned above is used by **Run** (p. 274) class while spawning new process.

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

- User.h

6.280 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 ®)

6.280.1 Detailed Description

Stores definitions for making decision if VOMS server is trusted

6.280.2 Constructor & Destructor Documentation

6.280.2.1 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 configured 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) .

6.280.2.2 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.371) and [AddRegex\(\)](#) (p.372) for more information.

6.280.3 Member Function Documentation

6.280.3.1 VOMSTrustChain& Arc::VOMSTrustList::AddChain (const VOMSTrustChain & *chain*)

Adds chain of trusted DNs to list. During verification each signature of AC is checked against all stored chains. DNs of chain of certificate used for signing AC are compared against DNs stored in these chains one by one. If needed DN of issuer of last certificate is checked too. Comparison succeeds if DNs in at least one stored chain are same as those in certificate chain. Comparison stops when all DNs in stored chain are compared. If there are more DNs in stored chain than in certificate chain then comparison fails. Empty stored list matches any certificate chain. Taking into account that certificate chains are verified down to trusted CA anyway, having more than one DN in stored chain seems to be useless. But such feature may be found useful by some very strict sysadmins. ??? IMO,DN list here is not only for authentication, it is also kind of ACL, which means the AC consumer only trusts those DNs which issues AC.

6.280.3.2 VOMSTrustChain& Arc::VOMSTrustList::AddChain (void)

Adds empty chain of trusted DNs to list.

6.280.3.3 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

6.281 Arc::WSAEndpointReference Class Reference

Interface for manipulation of WS-Addressing Endpoint Reference.

```
#include <WSA.h>
```

Public Member Functions

- **WSAEndpointReference** (XMLNode epr)
- **WSAEndpointReference** (const **WSAEndpointReference** &wsa)
- **WSAEndpointReference** (const std::string &address)
- **WSAEndpointReference** (void)
- **~WSAEndpointReference** (void)
- std::string **Address** (void) const
- void **Address** (const std::string &uri)
- **WSAEndpointReference** & **operator=** (const std::string &address)
- XMLNode **ReferenceParameters** (void)
- XMLNode **MetaData** (void)
- **operator XMLNode** (void)

6.281.1 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.

6.281.2 Constructor & Destructor Documentation

6.281.2.1 Arc::WSAEndpointReference::WSAEndpointReference (XMLNode *epr*)

Link to top level EPR XML node Linking to existing EPR in XML tree

6.281.2.2 Arc::WSAEndpointReference::WSAEndpointReference (const WSAEndpointReference & *wsa*)

Copy constructor

6.281.2.3 Arc::WSAEndpointReference::WSAEndpointReference (const std::string & *address*)

Creating independent EPR - not implemented

6.281.2.4 Arc::WSAEndpointReference::WSAEndpointReference (void)

Dummy constructor - creates invalid instance

6.281.2.5 Arc::WSAEndpointReference::~~WSAEndpointReference (void)

Destructor. All empty elements of EPR XML are destroyed here too

6.281.3 Member Function Documentation**6.281.3.1 std::string Arc::WSAEndpointReference::Address (void) const**

Returns Address ([URL](#) (p. 330)) encoded in EPR

6.281.3.2 void Arc::WSAEndpointReference::Address (const std::string & uri)

Assigns new Address value. If EPR had no Address element it is created.

6.281.3.3 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.

6.281.3.4 Arc::WSAEndpointReference::operator XMLNode (void)

Returns reference to EPR top XML node

6.281.3.5 WSAEndpointReference& Arc::WSAEndpointReference::operator= (const std::string & address)

Same as Address(uri)

6.281.3.6 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

6.282 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_**

6.282.1 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.

6.282.2 Constructor & Destructor Documentation

6.282.2.1 Arc::WSAHeader::WSAHeader (SOAPEnvelope & *soap*)

Linking to a header of existing SOAP message

6.282.2.2 Arc::WSAHeader::WSAHeader (const std::string & *action*)

Creating independent SOAP header - not implemented

6.282.3 Member Function Documentation

6.282.3.1 `std::string Arc::WSAHeader::Action (void) const`

Returns content of Action element of SOAP Header.

6.282.3.2 `void Arc::WSAHeader::Action (const std::string & uri)`

Set content of Action element of SOAP Header. If such element does not exist it's created.

6.282.3.3 `static bool Arc::WSAHeader::Check (SOAPEnvelope & soap) [static]`

Tells if specified SOAP message has WSA header

6.282.3.4 `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.

6.282.3.5 `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.

6.282.3.6 `std::string Arc::WSAHeader::MessageID (void) const`

Returns content of MessageID element of SOAP Header.

6.282.3.7 `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.

6.282.3.8 `XMLNode Arc::WSAHeader::NewReferenceParameter (const std::string & name)`

Creates new ReferenceParameter element with specified name. Returns reference to created element.

6.282.3.9 `Arc::WSAHeader::operator XMLNode (void)`

Returns reference to SOAP Header - not implemented

6.282.3.10 `XMLNode Arc::WSAHeader::ReferenceParameter (const std::string & name)`

Returns first ReferenceParameter element with specified name

6.282.3.11 `XMLNode Arc::WSAHeader::ReferenceParameter (int n)`

Return n-th ReferenceParameter element

6.282.3.12 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.

6.282.3.13 std::string Arc::WSAHeader::RelatesTo (void) const

Returns content of RelatesTo element of SOAP Header.

6.282.3.14 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.

6.282.3.15 std::string Arc::WSAHeader::RelationshipType (void) const

Returns content of RelationshipType element of SOAP Header.

6.282.3.16 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.

6.282.3.17 std::string Arc::WSAHeader::To (void) const

Returns content of To element of SOAP Header.

6.282.3.18 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.

6.282.4 Field Documentation**6.282.4.1 bool Arc::WSAHeader::header_allocated_ [protected]**

SOAP header element

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

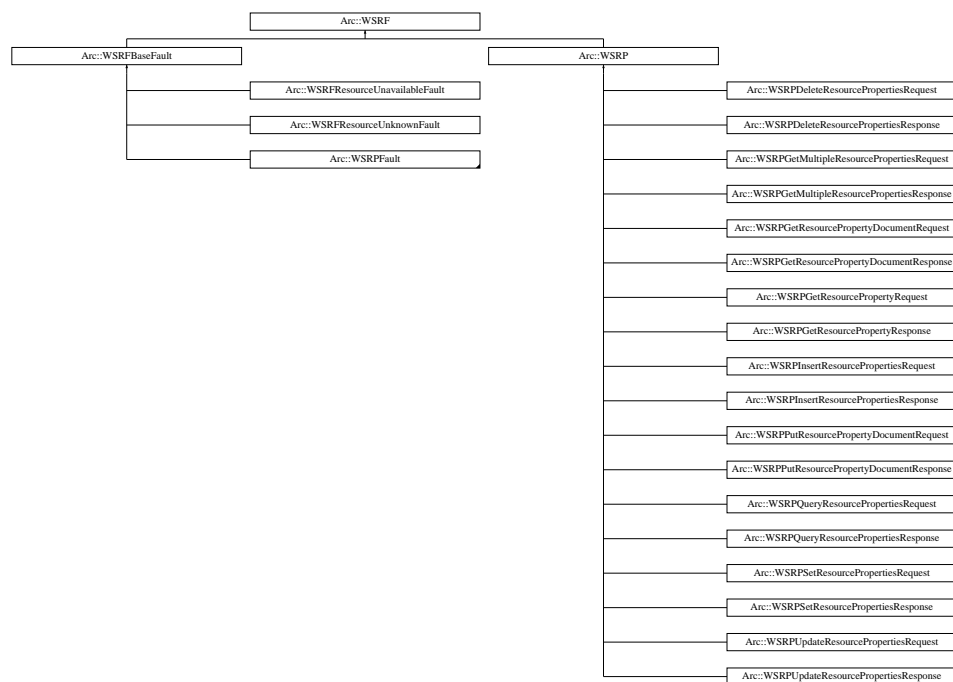
- WSA.h

6.283 Arc::WSRF Class Reference

Base class for every WSRF (p. 376) 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_**

6.283.1 Detailed Description

Base class for every **WSRF** (p. 376) message. This class is not intended to be used directly. Use it like reference while passing through unknown **WSRF** (p. 376) message or use classes derived from it.

6.283.2 Constructor & Destructor Documentation

6.283.2.1 Arc::WSRF::WSRF (SOAPEnvelope & soap, const std::string & action = " ")

Constructor - creates object out of supplied SOAP tree.

Public Member Functions

- **WSRFBaseFault** (SOAPEnvelope &soap)
- **WSRFBaseFault** (const std::string &type)

Protected Member Functions

- void **set_namespaces** (void)

6.284.1 Detailed Description

Base class for **WSRF** (p. 376) fault messages. Use classes inherited from it for specific faults.

6.284.2 Constructor & Destructor Documentation

6.284.2.1 Arc::WSRFBaseFault::WSRFBaseFault (SOAPEnvelope & soap)

Constructor - creates object out of supplied SOAP tree.

6.284.2.2 Arc::WSRFBaseFault::WSRFBaseFault (const std::string & type)

Constructor - creates new **WSRF** (p. 376) fault

6.284.3 Member Function Documentation

6.284.3.1 void Arc::WSRFBaseFault::set_namespaces (void) [protected]

set WS-ResourceProperties namespaces and default prefixes in SOAP message

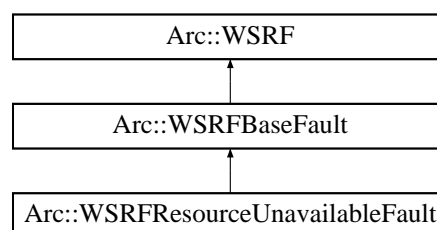
Reimplemented from **Arc::WSRF** (p. 378).

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

- WSRFBaseFault.h

6.285 Arc::WSRFResourceUnavailableFault Class Reference

Inheritance diagram for Arc::WSRFResourceUnavailableFault:

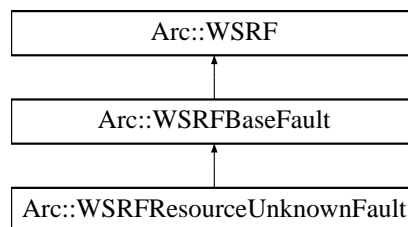


The documentation for this class was generated from the following file:

- WSRFBaseFault.h

6.286 Arc::WSRFResourceUnknownFault Class Reference

Inheritance diagram for Arc::WSRFResourceUnknownFault:



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

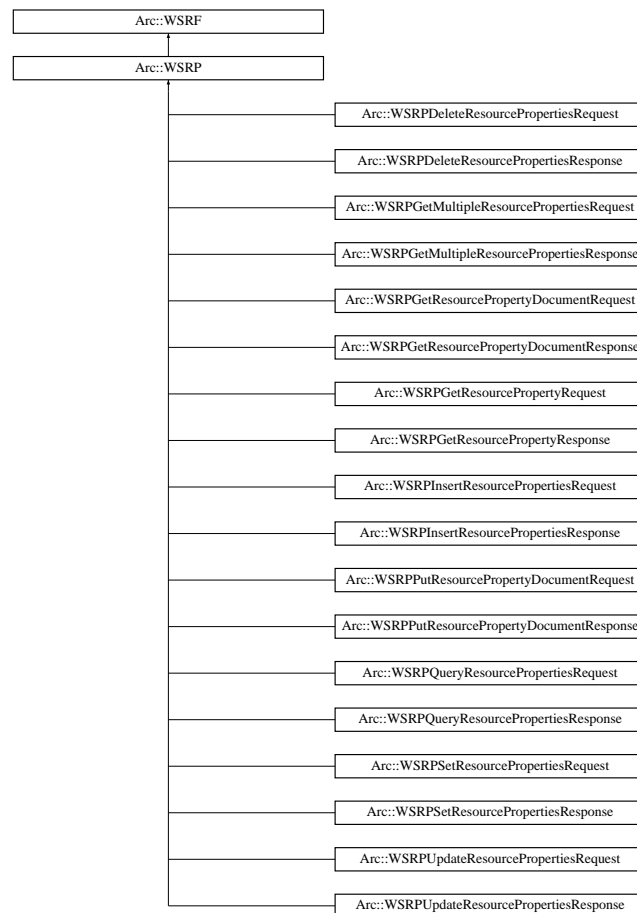
- WSRFBaseFault.h

6.287 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)

6.287.1 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.

6.287.2 Constructor & Destructor Documentation

6.287.2.1 Arc::WSRP::WSRP (bool *fault* = *false*, const std::string & *action* = "")

Constructor - prepares object for creation of new **WSRP** (p. 380) request/response/fault

6.287.2.2 `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.

6.287.3 Member Function Documentation

6.287.3.1 `void Arc::WSRP::set_namespaces (void)` **[protected]**

set WS-ResourceProperties namespaces and default prefixes in SOAP message

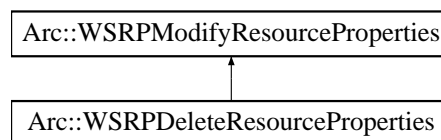
Reimplemented from `Arc::WSRF` (p. 378).

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

- `WSResourceProperties.h`

6.288 `Arc::WSRPDeleteResourceProperties` Class Reference

Inheritance diagram for `Arc::WSRPDeleteResourceProperties`:

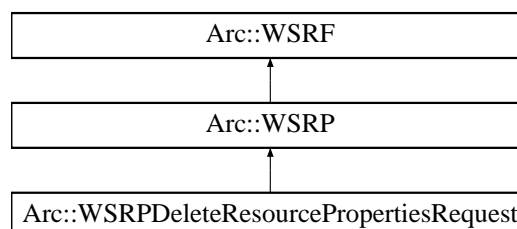


The documentation for this class was generated from the following file:

- `WSResourceProperties.h`

6.289 `Arc::WSRPDeleteResourcePropertiesRequest` Class Reference

Inheritance diagram for `Arc::WSRPDeleteResourcePropertiesRequest`:

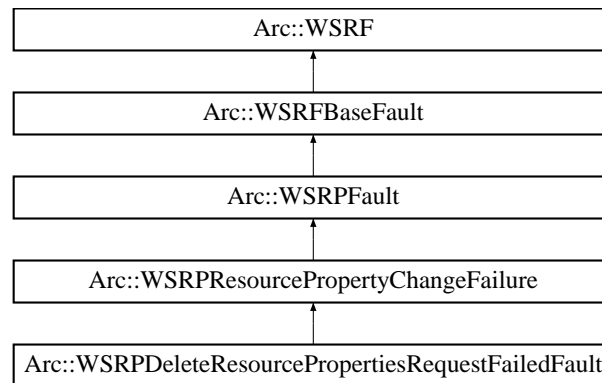


The documentation for this class was generated from the following file:

- `WSResourceProperties.h`

6.290 Arc::WSRPDeleteResourcePropertiesRequestFailedFault Class Reference

Inheritance diagram for Arc::WSRPDeleteResourcePropertiesRequestFailedFault:

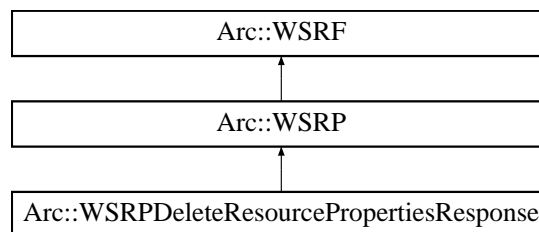


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.291 Arc::WSRPDeleteResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPDeleteResourcePropertiesResponse:



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

- WSResourceProperties.h

6.292 Arc::WSRPFault Class Reference

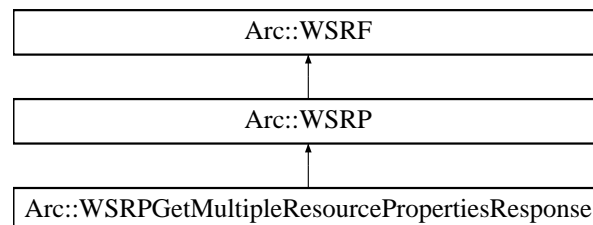
Base class for WS-ResourceProperties faults.

```
#include <WSResourceProperties.h>
```

Inheritance diagram for Arc::WSRPFault:

6.294 Arc::WSRPGetMultipleResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPGetMultipleResourcePropertiesResponse:

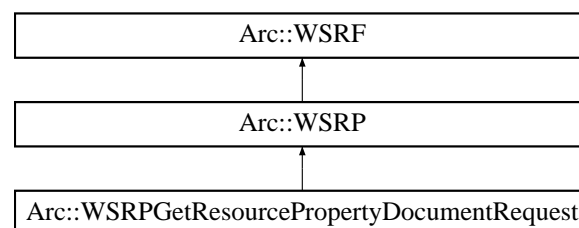


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.295 Arc::WSRPGetResourcePropertyDocumentRequest Class Reference

Inheritance diagram for Arc::WSRPGetResourcePropertyDocumentRequest:

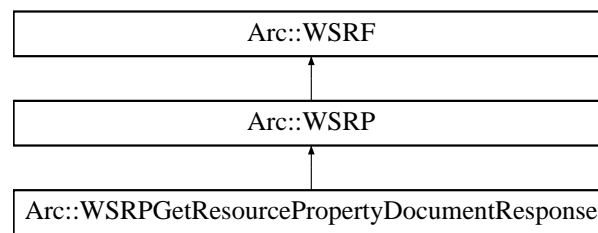


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.296 Arc::WSRPGetResourcePropertyDocumentResponse Class Reference

Inheritance diagram for Arc::WSRPGetResourcePropertyDocumentResponse:

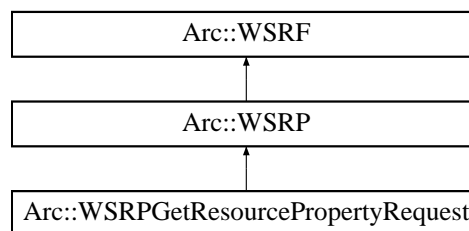


The documentation for this class was generated from the following file:

- `WSResourceProperties.h`

6.297 `Arc::WSRPGetResourcePropertyRequest` Class Reference

Inheritance diagram for `Arc::WSRPGetResourcePropertyRequest`:

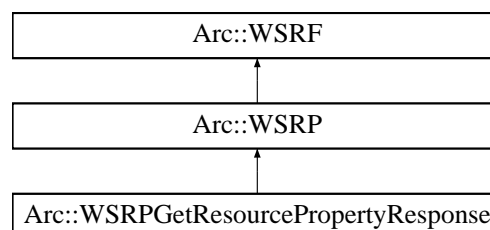


The documentation for this class was generated from the following file:

- `WSResourceProperties.h`

6.298 `Arc::WSRPGetResourcePropertyResponse` Class Reference

Inheritance diagram for `Arc::WSRPGetResourcePropertyResponse`:

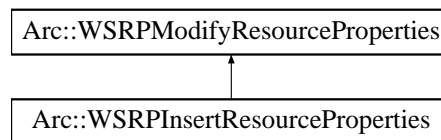


The documentation for this class was generated from the following file:

- `WSResourceProperties.h`

6.299 Arc::WSRPInsertResourceProperties Class Reference

Inheritance diagram for Arc::WSRPInsertResourceProperties:

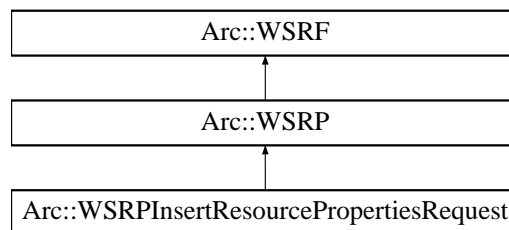


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.300 Arc::WSRPInsertResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPInsertResourcePropertiesRequest:

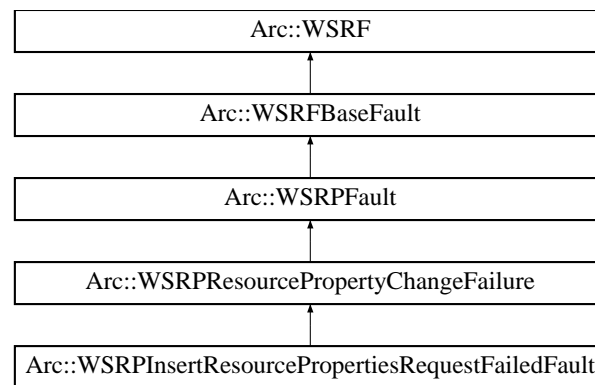


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.301 Arc::WSRPInsertResourcePropertiesRequestFailedFault Class Reference

Inheritance diagram for Arc::WSRPInsertResourcePropertiesRequestFailedFault:

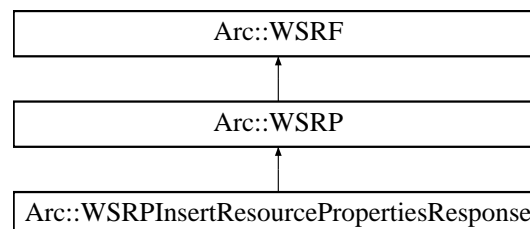


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.302 Arc::WSRPInsertResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPInsertResourcePropertiesResponse:

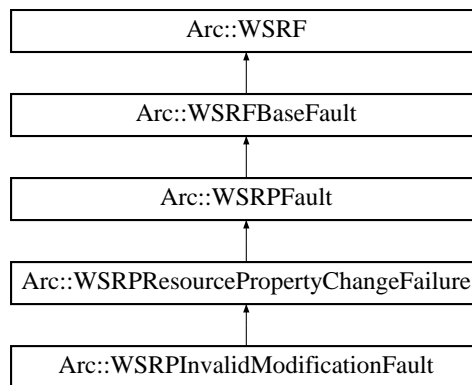


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.303 Arc::WSRPInvalidModificationFault Class Reference

Inheritance diagram for Arc::WSRPInvalidModificationFault:

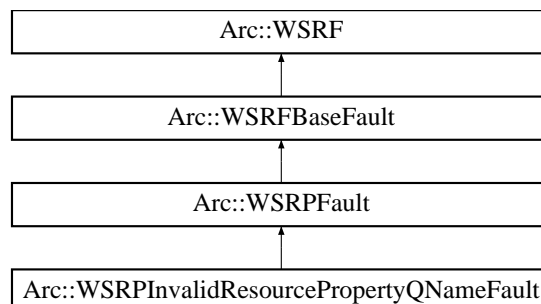


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.304 Arc::WSRPInvalidResourcePropertyQNameFault Class Reference

Inheritance diagram for Arc::WSRPInvalidResourcePropertyQNameFault:

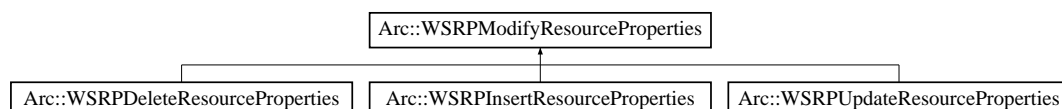


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.305 Arc::WSRPModifyResourceProperties Class Reference

Inheritance diagram for Arc::WSRPModifyResourceProperties:

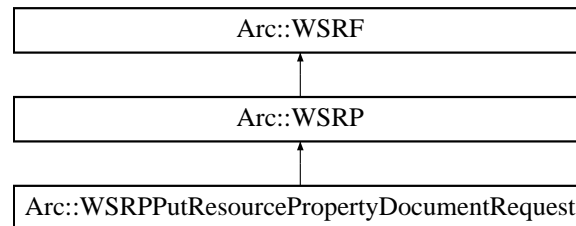


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.306 Arc::WSRPPutResourcePropertyDocumentRequest Class Reference

Inheritance diagram for Arc::WSRPPutResourcePropertyDocumentRequest:

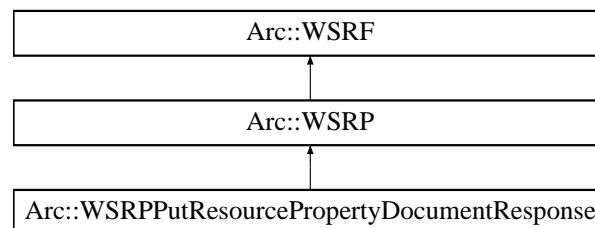


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.307 Arc::WSRPPutResourcePropertyDocumentResponse Class Reference

Inheritance diagram for Arc::WSRPPutResourcePropertyDocumentResponse:



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

- WSResourceProperties.h

6.308 Arc::WSRPQueryResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPQueryResourcePropertiesRequest:

6.310.1 Detailed Description

Base class for WS-ResourceProperties faults which contain ResourcePropertyChangeFailure

6.310.2 Constructor & Destructor Documentation

6.310.2.1 `Arc::WSRPResourcePropertyChangeFailure::WSRPResourcePropertyChangeFailure (SOAPEnvelope & soap) [inline]`

Constructor - creates object out of supplied SOAP tree.

6.310.2.2 `Arc::WSRPResourcePropertyChangeFailure::WSRPResourcePropertyChangeFailure (const std::string & type) [inline]`

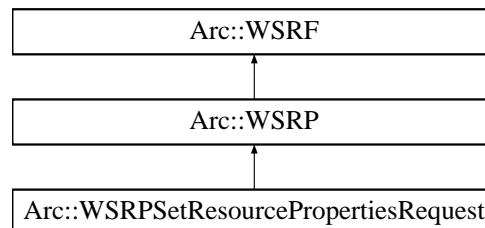
Constructor - creates new **WSRP** (p. 380) fault

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

- WSResourceProperties.h

6.311 Arc::WSRPSetResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPSetResourcePropertiesRequest:

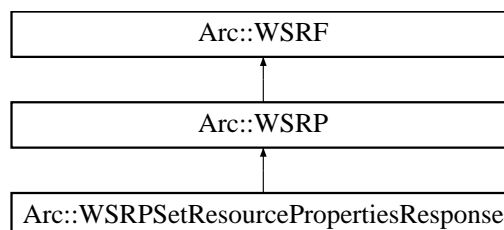


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.312 Arc::WSRPSetResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPSetResourcePropertiesResponse:

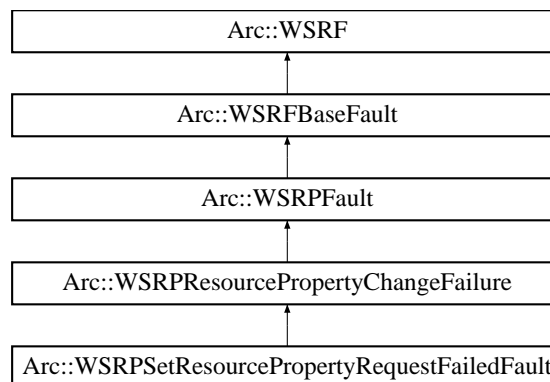


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.313 Arc::WSRPSetResourcePropertyRequestFailedFault Class Reference

Inheritance diagram for Arc::WSRPSetResourcePropertyRequestFailedFault:

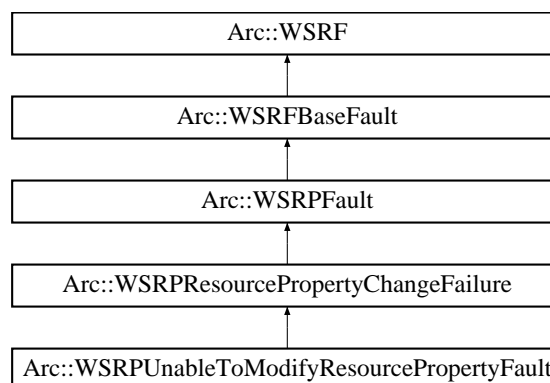


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.314 Arc::WSRPUnableToModifyResourcePropertyFault Class Reference

Inheritance diagram for Arc::WSRPUnableToModifyResourcePropertyFault:

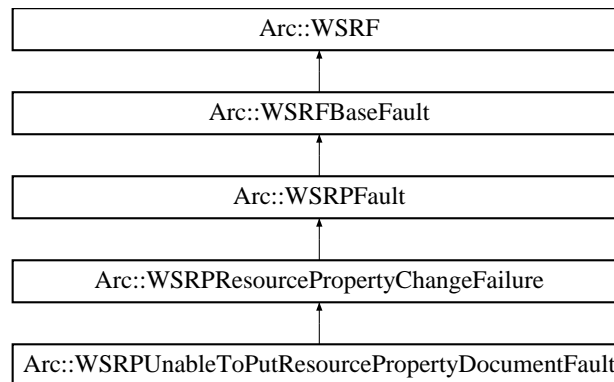


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.315 Arc::WSRPUnableToPutResourcePropertyDocumentFault Class Reference

Inheritance diagram for Arc::WSRPUnableToPutResourcePropertyDocumentFault:

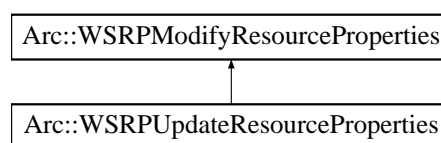


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.316 Arc::WSRPUUpdateResourceProperties Class Reference

Inheritance diagram for Arc::WSRPUUpdateResourceProperties:

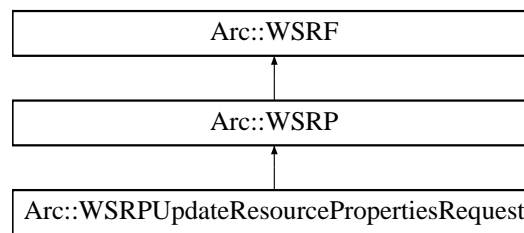


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.317 Arc::WSRPUUpdateResourcePropertiesRequest Class Reference

Inheritance diagram for Arc::WSRPUUpdateResourcePropertiesRequest:

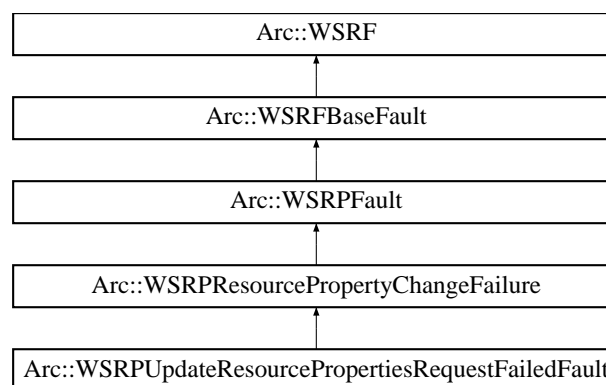


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.318 Arc::WSRPUUpdateResourcePropertiesRequestFailedFault Class Reference

Inheritance diagram for Arc::WSRPUUpdateResourcePropertiesRequestFailedFault:

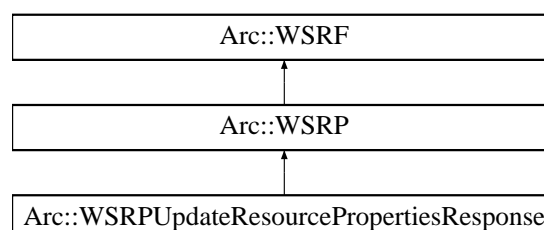


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.319 Arc::WSRPUUpdateResourcePropertiesResponse Class Reference

Inheritance diagram for Arc::WSRPUUpdateResourcePropertiesResponse:

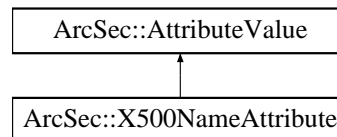


The documentation for this class was generated from the following file:

- WSResourceProperties.h

6.320 ArcSec::X500NameAttribute Class Reference

Inheritance diagram for ArcSec::X500NameAttribute:



Public Member Functions

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

6.320.1 Member Function Documentation

6.320.1.1 virtual std::string ArcSec::X500NameAttribute::encode () [inline, virtual]

encode the value in a string format

Implements ArcSec::AttributeValue (p. 57).

6.320.1.2 virtual bool ArcSec::X500NameAttribute::equal (AttributeValue * value, bool check_id = true) [virtual]

Evaluate whether "this" equale to the parameter value

Implements ArcSec::AttributeValue (p. 57).

6.320.1.3 virtual std::string ArcSec::X500NameAttribute::getId () [inline, virtual]

Get the AttributeId of the <Attribute>

Implements ArcSec::AttributeValue (p. 57).

6.320.1.4 virtual std::string ArcSec::X500NameAttribute::getType () [inline, virtual]

Get the DataType of the <Attribute>

Implements ArcSec::AttributeValue (p. 57).

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

- X500NameAttribute.h

6.321 Arc::X509Token Class Reference

Class for manipulating X.509 Token **Profile** (p. 264).

```
#include <X509Token.h>
```

Public Types

- enum **X509TokenType**

Public Member Functions

- **X509Token** (SOAPEnvelope &soap, const std::string &keyfile="")
- **X509Token** (SOAPEnvelope &soap, const std::string &certfile, const std::string &keyfile, **X509TokenType** token_type=Signature)
- **~X509Token** (void)
- **operator bool** (void)
- bool **Authenticate** (const std::string &cafile, const std::string &capath)
- bool **Authenticate** (void)

6.321.1 Detailed Description

Class for manipulating X.509 Token **Profile** (p. 264). 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.

6.321.2 Member Enumeration Documentation

6.321.2.1 enum Arc::X509Token::X509TokenType

X509TokenType is for distinguishing two types of operation. It is used as the parameter of constructor.

6.321.3 Constructor & Destructor Documentation

6.321.3.1 Arc::X509Token::X509Token (SOAPEnvelope & soap, const std::string & keyfile = "")

Constructor.Parse X509 Token information from SOAP header. X509 Token related information is extracted from SOAP header and stored in class variables. And then it the **X509Token** (p. 397) object will be used for authentication if the tokentype is Signature; otherwise if the tokentype is Encryption, the encrypted soap body will be decrypted and replaced by decrypted message. keyfile is only needed when the **X509Token** (p. 397) is encryption token

6.321.3.2 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.

6.321.3.3 Arc::X509Token::~~X509Token (void)

Deconstructor. Nothing to be done except finalizing the xmlsec library.

6.321.4 Member Function Documentation**6.321.4.1 bool Arc::X509Token::Authenticate (const std::string & *cafile*, const std::string & *capath*)**

Check signature by using the certificate information in **X509Token** (p.397) 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.397)) itself is checked, but also the certificate which is supposed to check the signature needs to be trusted (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

6.321.4.2 bool Arc::X509Token::Authenticate (void)

Check signature by using the cert information in soap message. Only the signature itself is checked, and it is not guranteed that the certificate which is supposed to check the signature is trusted.

6.321.4.3 Arc::X509Token::operator bool (void)

Returns true of constructor succeeded

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

- X509Token.h

6.322 Arc::XmlContainer Class Reference

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

- XmlContainer.h

6.323 Arc::XmlDatabase Class Reference

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

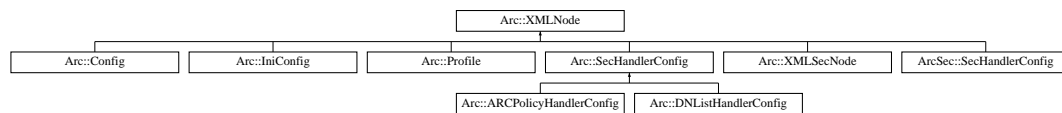
- XmlDatabase.h

6.324 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** &node) const
- void **Exchange** (**XMLNode** &node)
- void **Move** (**XMLNode** &node)
- void **Swap** (**XMLNode** &node)
- **operator bool** (void) const
- bool **operator!** (void) const
- bool **operator==** (const **XMLNode** &node)
- bool **operator!=** (const **XMLNode** &node)
- bool **Same** (const **XMLNode** &node)
- bool **operator==** (bool val)
- bool **operator!=** (bool val)
- bool **operator==** (const std::string &str)
- bool **operator!=** (const std::string &str)
- bool **operator==** (const char *str)
- bool **operator!=** (const char *str)
- **XMLNode Child** (int n=0)
- **XMLNode operator[]** (const char *name) const
- **XMLNode operator[]** (const std::string &name) const
- **XMLNode operator[]** (int n) const
- void **operator++** (void)
- void **operator--** (void)

- **int Size** (void) const
- **XMLNode Get** (const std::string &name) const
- **std::string Name** (void) const
- **std::string Prefix** (void) const
- **std::string FullName** (void) const
- **std::string Namespace** (void) const
- **void Name** (const char *name)
- **void Name** (const std::string &name)
- **void GetXML** (std::string &out_xml_str, bool user_friendly=false) const
- **void GetXML** (std::string &out_xml_str, const std::string &encoding, bool user_friendly=false) const
- **void GetDoc** (std::string &out_xml_str, bool user_friendly=false) const
- **operator std::string** (void) const
- **XMLNode & operator=** (const char *content)
- **XMLNode & operator=** (const std::string &content)
- **void Set** (const std::string &content)
- **XMLNode & operator=** (const XMLNode &node)
- **XMLNode Attribute** (int n=0)
- **XMLNode Attribute** (const char *name)
- **XMLNode Attribute** (const std::string &name)
- **XMLNode NewAttribute** (const char *name)
- **XMLNode NewAttribute** (const std::string &name)
- **int AttributesSize** (void) const
- **void Namespaces** (const NS &namespaces, bool keep=false, int recursion=-1)
- **NS Namespaces** (void)
- **std::string NamespacePrefix** (const char *urn)
- **XMLNode NewChild** (const char *name, int n=-1, bool global_order=false)
- **XMLNode NewChild** (const std::string &name, int n=-1, bool global_order=false)
- **XMLNode NewChild** (const char *name, const NS &namespaces, int n=-1, bool global_order=false)
- **XMLNode NewChild** (const std::string &name, const NS &namespaces, int n=-1, bool global_order=false)
- **XMLNode NewChild** (const XMLNode &node, int n=-1, bool global_order=false)
- **void Replace** (const XMLNode &node)
- **void Destroy** (void)
- **XMLNodeList Path** (const std::string &path)
- **XMLNodeList XPathLookup** (const std::string &xpathExpr, const NS &nsList)
- **XMLNode GetRoot** (void)
- **XMLNode Parent** (void)
- **bool SaveToFile** (const std::string &file_name) const
- **bool SaveToStream** (std::ostream &out) const
- **bool ReadFromFile** (const std::string &file_name)
- **bool ReadFromStream** (std::istream &in)
- **bool Validate** (const std::string &schema_file, std::string &err_msg)

Protected Member Functions

- **XMLNode** (xmlNodePtr node)

Protected Attributes

- bool `is_owner_`
- bool `is_temporary_`

Friends

- bool **MatchXMLName** (const **XMLNode** &node1, const **XMLNode** &node2)
- bool **MatchXMLName** (const **XMLNode** &node, const char *name)
- bool **MatchXMLName** (const **XMLNode** &node, const std::string &name)
- bool **MatchXMLNamespace** (const **XMLNode** &node1, const **XMLNode** &node2)
- bool **MatchXMLNamespace** (const **XMLNode** &node, const char *uri)
- bool **MatchXMLNamespace** (const **XMLNode** &node, const std::string &uri)

6.324.1 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.

6.324.2 Constructor & Destructor Documentation

6.324.2.1 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.

6.324.2.2 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.

6.324.2.3 Arc::XMLNode::XMLNode (const XMLNode & *node*) [inline]

Copies existing instance. Underlying XML element is NOT copied. Ownership is NOT inherited. Strictly speaking it should be no const here - but that conflicts with C++.

6.324.2.4 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

6.324.2.5 Arc::XMLNode::XMLNode (const char * *xml*, int *len* = -1)

Same as previous

6.324.2.6 Arc::XMLNode::XMLNode (long *ptr_addr*)

Copy constructor. Used by language bindings

6.324.2.7 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

6.324.2.8 Arc::XMLNode::~~XMLNode (void)

Destructor Also destroys underlying XML document if owned by this instance

6.324.3 Member Function Documentation**6.324.3.1 XMLNode Arc::XMLNode::Attribute (int *n* = 0)**

Returns list of all attributes of node.

Returns **XMLNode** (p. 399) instance representing *n*-th attribute of node.

Referenced by Attribute().

6.324.3.2 XMLNode Arc::XMLNode::Attribute (const char * *name*)

Returns **XMLNode** (p. 399) instance representing first attribute of node with specified by name

6.324.3.3 XMLNode Arc::XMLNode::Attribute (const std::string & *name*) [inline]

Returns **XMLNode** (p. 399) instance representing first attribute of node with specified by name

References Attribute().

6.324.3.4 int Arc::XMLNode::AttributesSize (void) const

Returns number of attributes of node

6.324.3.5 XMLNode Arc::XMLNode::Child (int *n* = 0)

Returns **XMLNode** (p. 399) instance representing *n*-th child of XML element. If such does not exist invalid **XMLNode** (p. 399) instance is returned

6.324.3.6 void Arc::XMLNode::Destroy (void)

Destroys underlying XML element. XML element is unlinked from XML tree and destroyed. After this operation **XMLNode** (p. 399) instance becomes invalid

6.324.3.7 void Arc::XMLNode::Exchange (XMLNode & node)

Exchanges XML (sub)trees. Following combinations are possible If either this or node are referring owned XML tree (top level node) then references are simply exchanged. This operation is fast. If both this and node are referring to XML (sub)tree of different documents then (sub)trees are exchanged between documents. If both this and node are referring to XML (sub)tree of same document then (sub)trees are moved inside document. The main reason for this method is to provide effective way to insert one XML document inside another. One should take into account that if any of exchanged nodes is top level it must be also owner of document. Otherwise method will fail. If both nodes are top level owners and/or invalid nodes then this method is identical to **Swap()** (p. 409).

6.324.3.8 std::string Arc::XMLNode::FullName (void) const [inline]

Returns prefix:name of XML node

References **Name()**, and **Prefix()**.

6.324.3.9 XMLNode Arc::XMLNode::Get (const std::string & name) const [inline]

Same as **operator[]**

References **operator[]()**.

6.324.3.10 void Arc::XMLNode::GetDoc (std::string & out_xml_str, bool user_friendly = false) const

Fills argument with whole XML document textual representation

6.324.3.11 XMLNode Arc::XMLNode::GetRoot (void)

Get the root node from any child node of the tree

6.324.3.12 void Arc::XMLNode::GetXML (std::string & out_xml_str, bool user_friendly = false) const

Fills argument with this instance XML subtree textual representation

6.324.3.13 void Arc::XMLNode::GetXML (std::string & out_xml_str, const std::string & encoding, bool user_friendly = false) const

Fills argument with this instance XML subtree textual representation if the XML subtree is corresponding to the encoding format specified in the argument, e.g. utf-8

6.324.3.14 void Arc::XMLNode::Move (XMLNode & *node*)

Moves content of this XML (sub)tree to node This operation is similar to New except that XML (sub)tree to referred by this is destroyed. This method is more effective than combination of New() (p. 404) and Destroy() (p. 403) because internally it is optimized not to copy data if not needed. The main purpose of this is to effectively extract part of XML document.

6.324.3.15 std::string Arc::XMLNode::Name (void) const

Returns name of XML node

Referenced by FullName(), and Name().

6.324.3.16 void Arc::XMLNode::Name (const std::string & *name*) [inline]

Assigns new name to XML node

References Name().

6.324.3.17 void Arc::XMLNode::Name (const char * *name*)

Assigns new name to XML node

6.324.3.18 std::string Arc::XMLNode::Namespace (void) const

Returns namespace URI of XML node

6.324.3.19 std::string Arc::XMLNode::NamespacePrefix (const char * *urn*)

Returns prefix of specified namespace. Empty string if no such namespace.

6.324.3.20 NS Arc::XMLNode::Namespaces (void)

Returns namespaces known at this node

6.324.3.21 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.

6.324.3.22 void Arc::XMLNode::New (XMLNode & *node*) const

Creates a copy of XML (sub)tree. If object does not represent whole document - top level document is created. 'new_node' becomes a pointer owning new XML document.

6.324.3.23 XMLNode Arc::XMLNode::NewAttribute (const char * *name*)

Creates new attribute with specified name.

Referenced by NewAttribute().

6.324.3.24 XMLNode Arc::XMLNode::NewAttribute (const std::string & *name*) [inline]

Creates new attribute with specified name.

References NewAttribute().

6.324.3.25 XMLNode Arc::XMLNode::NewChild (const char * *name*, int *n* = -1, bool *global_order* = *false*)

Creates new child XML element at specified position with specified name. Default is to put it at end of list. If global order is true position applies to whole set of children, otherwise only to children of same name. Returns created node.

Referenced by NewChild().

6.324.3.26 XMLNode Arc::XMLNode::NewChild (const std::string & *name*, int *n* = -1, bool *global_order* = *false*) [inline]

Same as NewChild(const char*,int,bool) (p. 405)

References NewChild().

6.324.3.27 XMLNode Arc::XMLNode::NewChild (const char * *name*, const NS & *namespaces*, int *n* = -1, bool *global_order* = *false*)

Creates new child XML element at specified position with specified name and namespaces. For more information look at NewChild(const char*,int,bool) (p. 405)

6.324.3.28 XMLNode Arc::XMLNode::NewChild (const std::string & *name*, const NS & *namespaces*, int *n* = -1, bool *global_order* = *false*) [inline]

Same as NewChild(const char*,const NS&,int,bool) (p. 405)

References NewChild().

6.324.3.29 XMLNode Arc::XMLNode::NewChild (const XMLNode & *node*, int *n* = -1, bool *global_order* = *false*)

Link a copy of supplied XML node as child. Returns instance referring to new child. XML element is a copy of supplied one but not owned by returned instance

6.324.3.30 Arc::XMLNode::operator bool (void) const [inline]

Returns true if instance points to XML element - valid instance

References is_temporary_.

6.324.3.31 `Arc::XMLNode::operator std::string (void) const`

Returns textual content of node excluding content of children nodes

6.324.3.32 `bool Arc::XMLNode::operator! (void) const [inline]`

Returns true if instance does not point to XML element - invalid instance

References `is_temporary_`.

6.324.3.33 `bool Arc::XMLNode::operator!= (const XMLNode & node) [inline]`

Returns false if 'node' represents same XML element

6.324.3.34 `bool Arc::XMLNode::operator!= (bool val) [inline]`

This operator is needed to avoid ambiguity

6.324.3.35 `bool Arc::XMLNode::operator!= (const std::string & str) [inline]`

This operator is needed to avoid ambiguity

6.324.3.36 `bool Arc::XMLNode::operator!= (const char * str) [inline]`

This operator is needed to avoid ambiguity

6.324.3.37 `void Arc::XMLNode::operator++ (void)`

Convenience operator to switch to next element of same name. If there is no such node this object becomes invalid.

6.324.3.38 `void Arc::XMLNode::operator-- (void)`

Convenience operator to switch to previous element of same name. If there is no such node this object becomes invalid.

6.324.3.39 `XMLNode& Arc::XMLNode::operator= (const char * content)`

Sets textual content of node. All existing children nodes are discarded.

Referenced by `operator=()`, and `Set()`.

6.324.3.40 `XMLNode& Arc::XMLNode::operator= (const XMLNode & node)`

Make instance refer to another XML node. Ownership is not inherited. Due to nature of **XMLNode** (p. 399) there should be no `const` here, but that does not fit into C++.

6.324.3.41 XMLNode& Arc::XMLNode::operator= (const std::string & *content*) [inline]

Sets textual content of node. All existing children nodes are discarded.

References operator=().

6.324.3.42 bool Arc::XMLNode::operator== (bool *val*) [inline]

This operator is needed to avoid ambiguity

6.324.3.43 bool Arc::XMLNode::operator== (const XMLNode & *node*) [inline]

Returns true if 'node' represents same XML element

Referenced by Same().

6.324.3.44 bool Arc::XMLNode::operator== (const char * *str*) [inline]

This operator is needed to avoid ambiguity

6.324.3.45 bool Arc::XMLNode::operator== (const std::string & *str*) [inline]

This operator is needed to avoid ambiguity

6.324.3.46 XMLNode Arc::XMLNode::operator[] (const char * *name*) const

Returns **XMLNode** (p. 399) 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. 399) instance is returned. This method should not be marked const because obtaining unrestricted **XMLNode** (p. 399) of child element allows modification of underlying XML tree. But in order to keep const in other places non-const-handling is passed to programmer. Otherwise C++ compiler goes nuts.

Referenced by Get(), and operator[]().

6.324.3.47 XMLNode Arc::XMLNode::operator[] (const std::string & *name*) const [inline]

Similar to previous method

References operator[]().

6.324.3.48 XMLNode Arc::XMLNode::operator[] (int *n*) const

Returns **XMLNode** (p. 399) instance representing n-th node in sequence of siblings of same name. It's main purpose is to be used to retrieve element in array of children of same name like node["name"][5]. This method should not be marked const because obtaining unrestricted **XMLNode** (p. 399) of child element allows modification of underlying XML tree. But in order to keep const in other places non-const-handling is passed to programmer. Otherwise C++ compiler goes nuts.

6.324.3.49 XMLNode Arc::XMLNode::Parent (void)

Get the parent node from any child node of the tree

6.324.3.50 XMLNodeList Arc::XMLNode::Path (const std::string & *path*)

Collects nodes corresponding to specified path. This is a convenience function to cover common use of XPath but without performance hit. Path is made of node_name[/node_name[...]] and is relative to current node. node_names are treated in same way as in operator[]. Returns all nodes which are represented by path.

6.324.3.51 std::string Arc::XMLNode::Prefix (void) const

Returns namespace prefix of XML node

Referenced by FullName().

6.324.3.52 bool Arc::XMLNode::ReadFromFile (const std::string & *file_name*)

Read XML document from file and associate it with this node

6.324.3.53 bool Arc::XMLNode::ReadFromStream (std::istream & *in*)

Read XML document from stream and associate it with this node

6.324.3.54 void Arc::XMLNode::Replace (const XMLNode & *node*)

Makes a copy of supplied XML node and makes this instance refer to it

6.324.3.55 bool Arc::XMLNode::Same (const XMLNode & *node*) [inline]

Returns true if 'node' represents same XML element - for bindings

References operator==().

6.324.3.56 bool Arc::XMLNode::SaveToFile (const std::string & *file_name*) const

Save string representation of node to file

6.324.3.57 bool Arc::XMLNode::SaveToStream (std::ostream & *out*) const

Save string representation of node to stream

6.324.3.58 void Arc::XMLNode::Set (const std::string & *content*) [inline]

Same as operator=. Used for bindings.

References operator=().

6.324.3.59 int Arc::XMLNode::Size (void) const

Returns number of children nodes

6.324.3.60 void Arc::XMLNode::Swap (XMLNode & node)

Swaps XML (sub)trees to this this and node refer. For XML subtrees this method is not anyhow different then using combinaion **XMLNode** (p. 399) tmp=*this; *this=node; node=tmp; But in case of either this or node owning XML document ownership is swapped too. And this is a main purpose of **Swap()** (p. 409) method.

6.324.3.61 bool Arc::XMLNode::Validate (const std::string & schema_file, std::string & err_msg)

Remove all eye-candy information leaving only informational parts * void Purify(void); XML schema validation against the schema file defined as argument

6.324.3.62 XMLNodeList Arc::XMLNode::XPathLookup (const std::string & xpathExpr, const NS & nsList)

Uses xPath to look up the whole xml structure, Returns a list of **XMLNode** (p. 399) 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. 265) is run on whole XML document but only the elements belonging to this XML subtree are returned.

6.324.4 Friends And Related Function Documentation**6.324.4.1 bool MatchXMLName (const XMLNode & node1, const XMLNode & node2) [friend]**

Returns true if underlying XML elements have same names

6.324.4.2 bool MatchXMLName (const XMLNode & node, const std::string & name) [friend]

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

6.324.4.3 bool MatchXMLName (const XMLNode & node, const char * name) [friend]

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

6.324.4.4 bool MatchXMLNamespace (const XMLNode & node1, const XMLNode & node2) [friend]

Returns true if underlying XML elements belong to same namespaces

6.324.4.5 **bool MatchXMLNamespace (const XMLNode & *node*, const std::string & *uri*)** [friend]

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

6.324.4.6 **bool MatchXMLNamespace (const XMLNode & *node*, const char * *uri*)** [friend]

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

6.324.5 Field Documentation

6.324.5.1 **bool Arc::XMLNode::is_owner_** [protected]

If true node is owned by this instance - hence released in destructor. Normally that may be true only for top level node of XML document.

6.324.5.2 **bool Arc::XMLNode::is_temporary_** [protected]

This variable is for future

Referenced by operator bool(), and operator!().

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

- XMLNode.h

6.325 Arc::XMLNodeContainer Class Reference

```
#include <XMLNode.h>
```

Public Member Functions

- **XMLNodeContainer** (void)
- **XMLNodeContainer** (const **XMLNodeContainer** &)
- **XMLNodeContainer & operator=** (const **XMLNodeContainer** &)
- void **Add** (const **XMLNode** &)
- void **Add** (const std::list< **XMLNode** > &)
- void **AddNew** (const **XMLNode** &)
- void **AddNew** (const std::list< **XMLNode** > &)
- int **Size** (void) const
- **XMLNode operator[]** (int)
- std::list< **XMLNode** > **Nodes** (void)

6.325.1 Detailed Description

Container for multiple **XMLNode** (p. 399) elements

6.325.2 Constructor & Destructor Documentation

6.325.2.1 Arc::XMLNodeContainer::XMLNodeContainer (void)

Default constructor

6.325.2.2 Arc::XMLNodeContainer::XMLNodeContainer (const XMLNodeContainer &)

Copy constructor. Add nodes from argument. Nodes owning XML document are copied using **AddNew()** (p. 411). Not owning nodes are linked using **Add()** (p. 411) method.

6.325.3 Member Function Documentation

6.325.3.1 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.

6.325.3.2 void Arc::XMLNodeContainer::Add (const std::list< XMLNode > &)

Link multiple XML subtrees to container.

6.325.3.3 void Arc::XMLNodeContainer::AddNew (const XMLNode &)

Copy XML subtree referenced by node to container. After this operation container refers to independent XML document. This document is deleted when container is destroyed.

6.325.3.4 void Arc::XMLNodeContainer::AddNew (const std::list< XMLNode > &)

Copy multiple XML subtrees to container.

6.325.3.5 std::list<XMLNode> Arc::XMLNodeContainer::Nodes (void)

Returns all stored nodes.

6.325.3.6 XMLNodeContainer& Arc::XMLNodeContainer::operator= (const XMLNodeContainer &)

Same as copy constructor with current nodes being deleted first.

6.325.3.7 XMLNode Arc::XMLNodeContainer::operator[] (int)

Returns n-th node in a store.

6.325.3.8 int Arc::XMLNodeContainer::Size (void) const

Return number of referred/stored nodes.

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

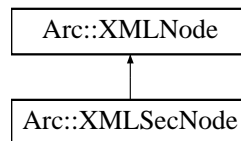
- XMLNode.h

6.326 Arc::XMLSecNode Class Reference

Extends **XMLNode** (p. 399) 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 encrpt_type)
- bool **DecryptNode** (const std::string &privkey_file, **XMLNode** &decrypted_node)

6.326.1 Detailed Description

Extends **XMLNode** (p. 399) class to support XML security operation. All **XMLNode** (p. 399) methods are exposed by inheriting from **XMLNode** (p. 399). **XMLSecNode** (p. 412) itself does not own node, instead it uses the node from the base class **XMLNode** (p. 399).

6.326.2 Constructor & Destructor Documentation

6.326.2.1 Arc::XMLSecNode::XMLSecNode (XMLNode & node)

Create a object based on an **XMLNode** (p. 399) instance.

6.326.3 Member Function Documentation

6.326.3.1 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

6.326.3.2 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

6.326.3.3 bool Arc::XMLSecNode::EncryptNode (const std::string & *cert_file*, const SymEncryptionType *encript_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

encript_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).

6.326.3.4 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

6.326.3.5 bool Arc::XMLSecNode::VerifyNode (const std::string & *id_name*, const std::string & *ca_file*, const std::string & *ca_path*, bool *verify_trusted* = *true*)

Verify the signature under this node

Parameters

id_name The id of this node, which is used for identifying the node

ca_file The CA file which used as trused certificate when verify the certificate in the <KeyInfo> part of <Signature>

ca_path The CA directory; either `ca_file` or `ca_path` should be set.

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

- XMLSecNode.h

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. 330) 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@][host][:port]][;urloptions[;...]][/path[?httpoption[&...]][;metadataoption[:...]]]` The 'protocol' and 'host' parts are treated as case-insensitive and to avoid confusion are converted to lowercase in constructor. Note that 'path' is always converted to absolute path in constructor. 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:` `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, 64
- ~Counter
 - Arc::Counter, 82
- ~Database
 - Arc::Database, 98
- ~IntraProcessCounter
 - Arc::IntraProcessCounter, 180
- ~JobControllerLoader
 - Arc::JobControllerLoader, 190
- ~JobDescriptionParserLoader
 - Arc::JobDescriptionParserLoader, 193
- ~Loader
 - Arc::Loader, 196
- ~Logger
 - Arc::Logger, 200
- ~MCCLoader
 - Arc::MCCLoader, 215
- ~Message
 - Arc::Message, 217
- ~PayloadRaw
 - Arc::PayloadRaw, 236
- ~PayloadStream
 - Arc::PayloadStream, 242
- ~Plexer
 - Arc::Plexer, 254
- ~Query
 - Arc::Query, 266
- ~Run
 - Arc::Run, 275
- ~SAMLToken
 - Arc::SAMLToken, 282
- ~SOAPMessage
 - Arc::SOAPMessage, 293
- ~SubmitterLoader
 - Arc::SubmitterLoader, 313
- ~TargetRetrieverLoader
 - Arc::TargetRetrieverLoader, 321
- ~URL
 - Arc::URL, 332
- ~URLLocation
 - Arc::URLLocation, 339
- ~WSAEndpointReference
 - Arc::WSAEndpointReference, 373
- ~X509Token
 - Arc::X509Token, 398
- ~XMLNode
 - Arc::XMLNode, 402
- Abandon
 - Arc::Run, 275
- ACCESS_LATENCY_LARGE
 - Arc::DataPoint, 110
- ACCESS_LATENCY_SMALL
 - Arc::DataPoint, 110
- ACCESS_LATENCY_ZERO
 - Arc::DataPoint, 110
- Acquire
 - Arc::DelegationConsumer, 137
 - Arc::InformationContainer, 175
- acquireDelegation
 - Arc::ClientX509Delegation, 74
- Action
 - Arc::WSAHeader, 375
- Add
 - Arc::MessageContext, 223
 - Arc::XMLNodeContainer, 411
- add
 - Arc::DataBuffer, 101
 - Arc::MessageAttributes, 219
 - Arc::SoftwareRequirement, 303
- AddBartender
 - Arc::UserConfig, 345
- AddCADir
 - Arc::BaseConfig, 60
- AddCAFile
 - Arc::BaseConfig, 60
- AddCertExtObj
 - Arc::Credential, 92
- AddCertificate
 - Arc::BaseConfig, 60
- AddChain
 - Arc::VOMSTrustList, 371
- AddChecksumObject
 - Arc::DataPoint, 111
 - Arc::DataPointDirect, 118
 - Arc::DataPointIndex, 124
- addDestination
 - Arc::Logger, 200
- addDestinations

- Arc::Logger, 201
- AddDN
 - Arc::FileCache, 161
- AddExtension
 - Arc::Credential, 92
- AddIndexServer
 - Arc::TargetGenerator, 315
- AddJob
 - Arc::TargetGenerator, 315, 316
- AddLDAPAttribute
 - Arc::URL, 332
- AddLocation
 - Arc::DataPoint, 111
 - Arc::DataPointDirect, 119
 - Arc::DataPointIndex, 124
- AddMetaDataOption
 - Arc::URL, 332
- AddNew
 - Arc::XMLNodeContainer, 411
- AddOption
 - Arc::URL, 332
- AddOverlay
 - Arc::BaseConfig, 60
- AddPluginsPath
 - Arc::BaseConfig, 60
- addPolicy
 - ArcSec::Evaluator, 150
 - ArcSec::Policy, 261
- AddPrivateKey
 - Arc::BaseConfig, 60
- AddProxy
 - Arc::BaseConfig, 60
- AddRegex
 - Arc::VOMSTrustList, 371
- addRegistrar
 - Arc::InfoRegisterContainer, 172
- addRequestItem
 - ArcSec::Request, 270
- Address
 - Arc::WSAEndpointReference, 373
- AddSecHandler
 - Arc::ClientSOAP, 71
 - Arc::MCC, 209
 - Arc::Service, 289
- AddService
 - Arc::TargetGenerator, 316
- addService
 - Arc::InfoRegisterContainer, 172
 - Arc::InfoRegistrar, 174
- AddServices
 - Arc::UserConfig, 345, 346
- AddSignatureTemplate
 - Arc::XMLSecNode, 412
- AddTarget
 - Arc::TargetGenerator, 316
- addVOMSAC
 - Arc, 37
- AfterFork
 - Arc::Run, 275
- allocated
 - Arc::PayloadRawBuf, 238
- allocated_
 - Arc::WSRF, 378
- ApplicationEnvironments
 - Arc::ExecutionTarget, 156
- ApplyToConfig
 - Arc::UserConfig, 346
- approveCSR
 - Arc::OAuthConsumer, 232
 - Arc::SAML2SSOHTTPClient, 279
- Arc, 23
 - addVOMSAC, 37
 - AttrConstIter, 35
 - AttrIter, 35
 - AttrMap, 35
 - BUSY_ERROR, 36
 - ContentFromPayload, 37
 - CreateThreadFunction, 37
 - createVOMSAC, 37
 - CredentialLogger, 42
 - FileOpen, 37
 - final_xmlsec, 37
 - GENERIC_ERROR, 36
 - get_cert_str, 38
 - get_key_from_certfile, 38
 - get_key_from_certstr, 38
 - get_key_from_keyfile, 38
 - get_key_from_keyst, 38
 - get_node, 38
 - get_plugin_instance, 35
 - get_property, 38
 - GUID, 38
 - init_xmlsec, 38
 - istring_to_level, 38
 - load_key_from_certfile, 39
 - load_key_from_certstr, 39
 - load_key_from_keyfile, 39
 - load_trusted_cert_file, 39
 - load_trusted_cert_str, 39
 - load_trusted_certs, 39
 - LogLevel, 36
 - MatchXMLName, 39, 40
 - MatchXMLNamespace, 40
 - OpenSSLInit, 40
 - operator<<, 40
 - parseVOMSAC, 40, 41
 - PARSING_ERROR, 36
 - passphrase_callback, 41

- plugins_table_name, 42
- PROTOCOL_RECOGNIZED_ERROR, 36
- SESSION_CLOSE, 36
- STATUS_OK, 36
- StatusKind, 36
- string, 41
- thread_stacksize, 42
- TimeStamp, 42
- UNKNOWN_SERVICE_ERROR, 36
- VOMSDecode, 42
- WSAFault, 36
- WSAFaultAssign, 42
- WSAFaultExtract, 42
- WSAFaultInvalidAddressingHeader, 36
- WSAFaultUnknown, 36
- Arc::Adler32Sum, 47
- Arc::ApplicationEnvironment, 50
- Arc::ApplicationType, 50
- Arc::ArcLocation, 50
 - GetPlugins, 51
 - Init, 51
- Arc::ARCPolicyHandlerConfig, 51
- Arc::AttributeIterator, 52
 - AttributeIterator, 53
 - current_, 55
 - end_, 55
 - hasMore, 53
 - key, 54
 - MessageAttributes, 54
 - operator*, 54
 - operator++, 54
 - operator->, 54
- Arc::AutoPointer, 58
- Arc::Base64, 59
- Arc::BaseConfig, 59
 - AddCAdir, 60
 - AddCAFile, 60
 - AddCertificate, 60
 - AddOverlay, 60
 - AddPluginsPath, 60
 - AddPrivateKey, 60
 - AddProxy, 60
 - GetOverlay, 60
 - MakeConfig, 60
- Arc::Broker, 62
 - GetBestTarget, 62
 - PossibleTargets, 63
 - PreFilterTargets, 62
 - SortTargets, 63
- Arc::BrokerLoader, 63
 - ~BrokerLoader, 64
 - BrokerLoader, 64
 - GetBrokers, 64
 - load, 64
- Arc::BrokerPluginArgument, 64
- Arc::ByteArray, 65
- Arc::CacheParameters, 65
- Arc::CertEnvLocker, 65
- Arc::ChainContext, 65
 - operator PluginsFactory *, 66
- Arc::Checksum, 66
- Arc::ChecksumAny, 66
- Arc::CIStrStringValue, 67
 - CIStrStringValue, 67
 - equal, 68
 - operator bool, 68
- Arc::ClassLoader, 68
- Arc::ClassLoaderPluginArgument, 68
- Arc::ClientHTTP, 69
- Arc::ClientHTTPwithSAML2SSO, 69
 - ClientHTTPwithSAML2SSO, 69
 - process, 70
- Arc::ClientInterface, 70
- Arc::ClientSOAP, 70
 - AddSecHandler, 71
 - ClientSOAP, 71
 - GetEntry, 71
 - Load, 71
 - process, 72
- Arc::ClientSOAPwithSAML2SSO, 72
 - ClientSOAPwithSAML2SSO, 72
 - process, 72
- Arc::ClientTCP, 73
- Arc::ClientX509Delegation, 73
 - acquireDelegation, 74
 - ClientX509Delegation, 74
 - createDelegation, 74
- Arc::Config, 76
 - Config, 76, 77
 - getFileName, 77
 - parse, 77
 - print, 77
 - save, 77
 - setFileName, 77
- Arc::ConfusaCertHandler, 77
 - ConfusaCertHandler, 78
 - createCertRequest, 78
 - getCertRequestB64, 78
- Arc::ConfusaParserUtils, 78
 - destroy_doc, 79
 - evaluate_path, 79
 - extract_body_information, 79
 - get_doc, 79
 - handle_redirect_step, 79
 - urlencode, 79
 - urlencode_params, 79
- Arc::CountedPointer, 80
- Arc::Counter, 80

- ~Counter, 82
- cancel, 83
- changeExcess, 83
- changeLimit, 83
- Counter, 82
- extend, 83
- getCounterTicket, 84
- getCurrentTime, 84
- getExcess, 84
- getExpirationReminder, 85
- getExpiryTime, 85
- getLimit, 85
- getValue, 85
- IDType, 82
- reserve, 86
- setExcess, 86
- setLimit, 86
- Arc::CounterTicket, 87
 - cancel, 88
 - CounterTicket, 88
 - extend, 88
 - isValid, 88
- Arc::CRC32Sum, 88
- Arc::Credential, 89
 - AddCertExtObj, 92
 - AddExtension, 92
 - Credential, 90, 91
 - GenerateEECRequest, 92
 - GenerateRequest, 92, 93
 - GetCert, 93
 - GetCertNumofChain, 93
 - GetCertReq, 93
 - GetDN, 93
 - GetEndTime, 93
 - getFormat, 93
 - GetIdentityName, 93
 - GetLifeTime, 93
 - GetPrivKey, 93
 - GetProxyPolicy, 94
 - GetPubKey, 94
 - GetStartTime, 94
 - GetType, 94
 - GetVerification, 94
 - InitProxyCertInfo, 94
 - InquireRequest, 94
 - IsCredentialsValid, 94
 - IsValid, 95
 - LogError, 95
 - OutputCertificate, 95
 - OutputCertificateChain, 95
 - OutputPrivatekey, 95
 - OutputPublickey, 95
 - SetLifeTime, 95
 - SetProxyPolicy, 95
 - SetStartTime, 96
 - SignEECRequest, 96
 - SignRequest, 96
 - STACK_OF, 96
- Arc::CredentialError, 97
 - CredentialError, 97
- Arc::CredentialStore, 97
- Arc::Database, 98
 - ~Database, 98
 - close, 99
 - connect, 99
 - Database, 98
 - enable_ssl, 99
 - isconnected, 99
 - shutdown, 99
- Arc::DataBuffer, 100
 - add, 101
 - buffer_size, 101
 - checksum_object, 101
 - checksum_valid, 102
 - DataBuffer, 101
 - eof_read, 102
 - eof_write, 102
 - error, 102
 - error_read, 102
 - error_write, 102
 - for_read, 103
 - for_write, 103
 - is_notwritten, 103
 - is_read, 104
 - is_written, 104
 - set, 104
 - wait_any, 105
- Arc::DataCallback, 105
- Arc::DataHandle, 105
- Arc::DataMover, 106
 - checks, 106
 - force_to_meta, 106
 - secure, 107
 - set_default_max_inactivity_time, 107
 - set_default_min_average_speed, 107
 - set_default_min_speed, 107
 - Transfer, 107
 - verbose, 108
- Arc::DataPoint, 108
 - ACCESS_LATENCY_LARGE, 110
 - ACCESS_LATENCY_SMALL, 110
 - ACCESS_LATENCY_ZERO, 110
 - AddCheckSumObject, 111
 - AddLocation, 111
 - Check, 111
 - CompareLocationMetadata, 112
 - CompareMeta, 112
 - CurrentLocationMetadata, 112

- DataPoint, 111
- DataPointAccessLatency, 110
- DataPointInfoType, 110
- GetFailureReason, 112
- INFO_TYPE_ACCESS, 111
- INFO_TYPE_ALL, 111
- INFO_TYPE_CONTENT, 111
- INFO_TYPE_NAME, 111
- INFO_TYPE_REST, 111
- INFO_TYPE_STRUCT, 111
- INFO_TYPE_TIMES, 111
- INFO_TYPE_TYPE, 111
- List, 112
- NextLocation, 112
- Passive, 113
- PostRegister, 113
- PreRegister, 113
- PreUnregister, 113
- ProvidesMeta, 114
- Range, 114
- ReadOutOfOrder, 114
- Registered, 114
- Resolve, 114
- SetAdditionalChecks, 115
- SetMeta, 115
- SetSecure, 115
- SortLocations, 115
- StartReading, 115
- StartWriting, 116
- Stat, 116
- StopReading, 116
- StopWriting, 116
- Unregister, 117
- valid_url_options, 117
- WriteOutOfOrder, 117
- Arc::DataPointDirect, 117
 - AddChecksumObject, 118
 - AddLocation, 119
 - CompareLocationMetadata, 119
 - CurrentLocationMetadata, 119
 - NextLocation, 119
 - Passive, 119
 - PostRegister, 119
 - PreRegister, 120
 - PreUnregister, 120
 - ProvidesMeta, 120
 - Range, 120
 - ReadOutOfOrder, 121
 - Registered, 121
 - Resolve, 121
 - SetAdditionalChecks, 121
 - SetSecure, 121
 - SortLocations, 122
 - Unregister, 122
 - WriteOutOfOrder, 122
- Arc::DataPointIndex, 122
 - AddChecksumObject, 124
 - AddLocation, 124
 - Check, 124
 - CompareLocationMetadata, 124
 - CurrentLocationMetadata, 124
 - NextLocation, 125
 - Passive, 125
 - ProvidesMeta, 125
 - Range, 125
 - ReadOutOfOrder, 125
 - Registered, 126
 - SetAdditionalChecks, 126
 - SetMeta, 126
 - SetSecure, 126
 - SortLocations, 126
 - StartReading, 126
 - StartWriting, 127
 - StopReading, 127
 - StopWriting, 127
 - WriteOutOfOrder, 127
- Arc::DataPointLoader, 128
- Arc::DataPointPluginArgument, 128
- Arc::DataSourceType, 128
- Arc::DataSpeed, 128
 - DataSpeed, 129
 - hold, 130
 - set_base, 130
 - set_max_data, 130
 - set_max_inactivity_time, 130
 - set_min_average_speed, 130
 - set_min_speed, 130
 - set_progress_indicator, 131
 - transfer, 131
 - verbose, 131
- Arc::DataStagingType, 131
- Arc::DataStatus, 132
 - CacheError, 133
 - CheckError, 133
 - CredentialsExpiredError, 133
 - DataStatusType, 132
 - DeleteError, 133
 - InconsistentMetadataError, 133
 - IsReadingError, 133
 - IsWritingError, 133
 - ListError, 133
 - LocationAlreadyExistsError, 133
 - NoLocationError, 133
 - NotInitializedError, 133
 - NotSupportedForDirectDataPointsError, 133
 - PostRegisterError, 132
 - PreRegisterError, 132
 - ReadAcquireError, 132

- ReadError, 132
- ReadResolveError, 132
- ReadStartError, 132
- ReadStopError, 132
- StageError, 133
- StatError, 133
- Success, 132
- SuccessCached, 133
- SystemError, 133
- TransferError, 132
- UnimplementedError, 133
- UnknownError, 133
- UnregisterError, 132
- WriteAcquireError, 132
- WriteError, 132
- WriteResolveError, 132
- WriteStartError, 132
- WriteStopError, 132
- Arc::DataTargetType, 133
- Arc::DataType, 133
- Arc::DBranch, 136
- Arc::DelegationConsumer, 136
 - Acquire, 137
 - Backup, 137
 - DelegationConsumer, 137
 - Generate, 137
 - ID, 137
 - LogError, 137
 - Request, 137
 - Restore, 137
- Arc::DelegationConsumerSOAP, 138
 - DelegateCredentialsInit, 138
 - DelegatedToken, 138
 - DelegationConsumerSOAP, 138
 - UpdateCredentials, 139
- Arc::DelegationContainerSOAP, 139
 - context_lock_, 140
 - DelegateCredentialsInit, 140
 - DelegatedToken, 140
 - max_duration_, 140
 - max_size_, 140
 - max_usage_, 140
 - restricted_, 140
 - UpdateCredentials, 140
- Arc::DelegationProvider, 140
 - Delegate, 141
 - DelegationProvider, 141
- Arc::DelegationProviderSOAP, 141
 - DelegateCredentialsInit, 143
 - DelegatedToken, 143
 - DelegationProviderSOAP, 142
 - ID, 143
 - UpdateCredentials, 143
- Arc::DirectoryType, 145
- Arc::DiskSpaceRequirementType, 145
- Arc::DItem, 145
- Arc::DItemString, 145
- Arc::DNListHandlerConfig, 146
- Arc::ExecutableType, 154
- Arc::ExecutionTarget, 154
 - ApplicationEnvironments, 156
 - ComputingShareName, 156
 - ExecutionTarget, 154, 155
 - FreeSlotsWithDuration, 156
 - GetSubmitter, 155
 - MaxDiskSpace, 156
 - MaxMainMemory, 157
 - MaxVirtualMemory, 157
 - OperatingSystem, 157
 - operator=, 155
 - Print, 155
 - SaveToStream, 156
 - Update, 156
- Arc::ExpirationReminder, 157
 - getExpiryTime, 158
 - getReservationID, 158
 - operator<, 158
- Arc::FileCache, 158
 - AddDN, 161
 - CheckCreated, 161
 - CheckDN, 161
 - CheckValid, 161
 - Copy, 161
 - File, 161
 - FileCache, 160
 - GetCreated, 161
 - GetValid, 162
 - Link, 162
 - operator bool, 162
 - operator==, 162
 - Release, 162
 - SetValid, 162
 - Start, 162
 - Stop, 163
 - StopAndDelete, 163
- Arc::FileInfo, 164
- Arc::FileLock, 164
- Arc::FileType, 165
- Arc::FinderLoader, 165
- Arc::GlobusResult, 168
- Arc::GSSCredential, 168
- Arc::HakaClient, 168
 - processConsent, 169
 - processIdP2Confusa, 169
 - processIdPLogin, 169
- Arc::HTTPClientInfo, 169
- Arc::InfoCache, 169
 - InfoCache, 170

- Arc::InfoCacheInterface, 170
 - Get, 170
- Arc::InfoFilter, 170
 - Filter, 171
 - InfoFilter, 171
- Arc::InfoRegister, 171
- Arc::InfoRegisterContainer, 172
 - addRegistrar, 172
 - addService, 172
 - removeService, 172
- Arc::InfoRegisters, 173
 - InfoRegisters, 173
- Arc::InfoRegistrar, 173
 - addService, 174
 - registration, 174
- Arc::InformationContainer, 174
 - Acquire, 175
 - Assign, 175
 - doc_, 175
 - Get, 175
 - InformationContainer, 175
- Arc::InformationInterface, 175
 - Get, 176
 - InformationInterface, 176
 - lock_, 176
- Arc::InformationRequest, 176
 - InformationRequest, 177
 - SOAP, 177
- Arc::InformationResponse, 178
 - InformationResponse, 178
 - Result, 178
- Arc::IniConfig, 178
- Arc::initializeCredentialsType, 179
- Arc::IntraProcessCounter, 179
 - ~IntraProcessCounter, 180
 - cancel, 181
 - changeExcess, 181
 - changeLimit, 181
 - extend, 181
 - getExcess, 182
 - getLimit, 182
 - getValue, 182
 - IntraProcessCounter, 180
 - reserve, 183
 - setExcess, 183
 - setLimit, 183
- Arc::ISIS_description, 184
- Arc::IString, 184
- Arc::Job, 184
 - Job, 185
 - operator=, 185
 - Print, 185
 - SaveToStream, 185
 - ToXML, 185
- Arc::JobController, 186
 - Cat, 187
 - FillJobStore, 188
 - Migrate, 188
 - PrintJobStatus, 188
 - SaveJobStatusToStream, 188
- Arc::JobControllerLoader, 189
 - ~JobControllerLoader, 190
 - GetJobControllers, 190
 - JobControllerLoader, 190
 - load, 190
- Arc::JobControllerPluginArgument, 190
- Arc::JobDescription, 191
 - Print, 191
 - SaveToStream, 191
- Arc::JobDescriptionParser, 192
- Arc::JobDescriptionParserLoader, 192
 - ~JobDescriptionParserLoader, 193
 - GetJobDescriptionParsers, 193
 - JobDescriptionParserLoader, 193
 - load, 193
- Arc::JobDescriptionParserLoader::iterator, 184
- Arc::JobIdentificationType, 193
- Arc::JobMetaType, 193
- Arc::JobState, 194
- Arc::JobSupervisor, 194
 - GetJobControllers, 195
 - JobSupervisor, 194
- Arc::LoadableModuleDescription, 195
- Arc::Loader, 195
 - ~Loader, 196
 - factory_, 196
 - Loader, 196
- Arc::LogDestination, 196
 - LogDestination, 197
- Arc::LogFile, 197
 - log, 198
 - LogFile, 198
 - setBackups, 198
 - setMaxSize, 198
 - setReopen, 199
- Arc::Logger, 199
 - ~Logger, 200
 - addDestination, 200
 - addDestinations, 201
 - getDestinations, 201
 - getRootLogger, 201
 - getThreshold, 201
 - Logger, 200
 - msg, 201
 - setThreadContext, 202
 - setThreshold, 202
 - setThresholdForDomain, 202
- Arc::LoggerContext, 203

- Arc::LoggerFormat, 203
- Arc::LogMessage, 203
 - getLevel, 204
 - Logger, 205
 - LogMessage, 204
 - operator<<, 205
 - setIdentifier, 204
- Arc::LogStream, 205
 - log, 206
 - LogStream, 206
- Arc::MCC, 207
 - AddSecHandler, 209
 - logger, 209
 - MCC, 208
 - Next, 209
 - next_, 209
 - process, 209
 - ProcessSecHandlers, 209
 - sechandlers_, 210
 - Unlink, 209
- Arc::MCC_Status, 210
 - getExplanation, 211
 - getKind, 211
 - getOrigin, 211
 - isOk, 211
 - MCC_Status, 210
 - operator bool, 211
 - operator std::string, 212
- Arc::MCCConfig, 212
 - MakeConfig, 213
- Arc::MCCInterface, 213
 - process, 213
- Arc::MCCLoader, 214
 - ~MCCLoader, 215
 - MCCLoader, 215
 - operator[], 215
- Arc::MCCPluginArgument, 215
- Arc::MD5Sum, 215
- Arc::MemoryAllocationException, 216
- Arc::Message, 216
 - ~Message, 217
 - Attributes, 217
 - Auth, 217
 - AuthContext, 217
 - Context, 218
 - Message, 217
 - operator=, 218
 - Payload, 218
- Arc::MessageAttributes, 218
 - add, 219
 - attributes_, 221
 - count, 219
 - get, 220
 - getAll, 220
 - MessageAttributes, 219
 - remove, 220
 - removeAll, 220
 - set, 221
- Arc::MessageAuth, 221
 - Export, 222
 - Filter, 222
- Arc::MessageAuthContext, 222
- Arc::MessageContext, 223
 - Add, 223
- Arc::MessageContextElement, 223
- Arc::MessagePayload, 224
- Arc::ModuleDesc, 224
- Arc::ModuleManager, 224
 - find, 225
 - findLocation, 225
 - load, 225
 - makePersistent, 225, 226
 - ModuleManager, 225
 - reload, 226
 - setCfg, 226
 - unload, 226
- Arc::MultiSecAttr, 226
 - Export, 227
 - operator bool, 227
- Arc::MySQLDatabase, 227
 - close, 228
 - connect, 228
 - enable_ssl, 228
 - isconnected, 228
 - shutdown, 228
- Arc::MySQLQuery, 229
 - execute, 229
 - get_array, 229
 - get_num_columns, 229
 - get_num_rows, 230
 - get_row, 230
 - get_row_field, 230
- Arc::NotificationType, 231
- Arc::NS, 231
- Arc::OAuthConsumer, 231
 - approveCSR, 232
 - OAuthConsumer, 232
 - parseDN, 232
 - processLogin, 232
 - pushCSR, 232
 - storeCert, 232
- Arc::OpenIdpClient, 232
 - processConsent, 233
 - processIdP2Confusa, 233
 - processIdPLogin, 233
- Arc::OptionParser, 233
- Arc::PathIterator, 234
 - operator bool, 235

- operator*, 235
- operator++, 235
- operator--, 235
- PathIterator, 234
- Rest, 235
- Arc::PayloadRaw, 235
 - ~PayloadRaw, 236
 - Buffer, 236
 - BufferPos, 236
 - BufferSize, 236
 - Content, 236
 - Insert, 237
 - operator[], 237
 - PayloadRaw, 236
 - Size, 237
 - Truncate, 237
- Arc::PayloadRawBuf, 237
 - allocated, 238
 - length, 238
 - size, 238
- Arc::PayloadRawInterface, 238
 - Buffer, 239
 - BufferPos, 239
 - BufferSize, 239
 - Content, 239
 - Insert, 239
 - operator[], 239
 - Size, 240
 - Truncate, 240
- Arc::PayloadSOAP, 240
 - PayloadSOAP, 241
- Arc::PayloadStream, 241
 - ~PayloadStream, 242
 - Get, 242
 - handle_, 244
 - Limit, 242
 - operator bool, 243
 - PayloadStream, 242
 - Pos, 243
 - Put, 243
 - seekable_, 244
 - Size, 243
 - Timeout, 244
- Arc::PayloadStreamInterface, 244
 - Get, 245
 - Limit, 245
 - operator bool, 245
 - Pos, 246
 - Put, 246
 - Size, 246
 - Timeout, 246
- Arc::PayloadWSRF, 247
 - PayloadWSRF, 247
- Arc::Period, 249
 - GetPeriod, 250
 - istr, 250
 - operator std::string, 250
 - operator<, 250
 - operator<=, 250
 - operator>, 250
 - operator>=, 250
 - operator=, 250
 - operator==, 250
 - Period, 249
 - SetPeriod, 251
- Arc::Plexer, 253
 - ~Plexer, 254
 - logger, 254
 - Next, 254
 - Plexer, 254
 - process, 254
- Arc::PlexerEntry, 255
- Arc::Plugin, 255
- Arc::PluginArgument, 256
 - get_factory, 257
 - get_module, 257
- Arc::PluginDesc, 258
- Arc::PluginDescriptor, 258
- Arc::PluginsFactory, 258
 - FilterByKind, 259
 - load, 259
 - PluginsFactory, 259
 - report, 259
 - scan, 260
 - TryLoad, 260
- Arc::Printf, 264
- Arc::PrintfBase, 264
- Arc::Profile, 264
- Arc::Query, 265
 - ~Query, 266
 - execute, 266
 - get_array, 266
 - get_num_columns, 266
 - get_num_rows, 266
 - get_row, 266, 267
 - get_row_field, 267
 - Query, 265
- Arc::Range, 267
- Arc::Register_Info_Type, 268
- Arc::RegisteredService, 268
 - RegisteredService, 268
- Arc::RegularExpression, 268
 - match, 269
- Arc::ResourceSlotType, 273
- Arc::ResourcesType, 273
- Arc::ResourceTargetType, 273
- Arc::Run, 274
 - ~Run, 275

- Abandon, 275
- AfterFork, 275
- AssignStderr, 275
- AssignStdin, 275
- AssignStdout, 275
- AssignWorkingDirectory, 275
- CloseStderr, 275
- CloseStdin, 276
- CloseStdout, 276
- KeepStderr, 276
- KeepStdin, 276
- KeepStdout, 276
- Kill, 276
- operator bool, 276
- ReadStderr, 276
- ReadStdout, 276
- Result, 277
- Run, 275
- Running, 277
- Start, 277
- Wait, 277
- WriteStdin, 277
- Arc::SAML2LoginClient, 277
 - findSimpleSAMLInstallation, 278
 - processLogin, 278
 - SAML2LoginClient, 278
- Arc::SAML2SSOHTTPClient, 278
 - approveCSR, 279
 - parseDN, 279
 - processConsent, 279
 - processIdP2Confusa, 279
 - processIdPLogin, 279
 - processLogin, 279
 - pushCSR, 280
 - storeCert, 280
- Arc::SAMLToken, 280
 - ~SAMLToken, 282
 - Authenticate, 282
 - operator bool, 282
 - SAMLToken, 281, 282
 - SAMLVersion, 281
- Arc::ScalableTime, 283
- Arc::ScalableTime< int >, 283
- Arc::SecAttr, 283
 - Export, 284
 - Import, 284
 - operator bool, 284
 - operator==, 284
- Arc::SecAttrFormat, 285
- Arc::SecAttrValue, 285
 - operator bool, 286
 - operator==, 286
- Arc::SecHandlerConfig, 287
- Arc::Service, 288
 - AddSecHandler, 289
 - getID, 289
 - logger, 290
 - ProcessSecHandlers, 289
 - RegistrationCollector, 289
 - sechandlers_, 290
 - Service, 289
- Arc::ServicePluginArgument, 290
- Arc::SimpleCondition, 290
 - broadcast, 291
 - lock, 291
 - reset, 291
 - signal, 291
 - signal_nonblock, 291
 - unlock, 291
 - wait, 291
 - wait_nonblock, 291
- Arc::SimpleCounter, 292
 - wait, 292
- Arc::SOAPMessage, 292
 - ~SOAPMessage, 293
 - Attributes, 293
 - Payload, 293
 - SOAPMessage, 293
- Arc::Software, 293
 - ComparisonOperator, 295
 - ComparisonOperatorEnum, 295
 - convert, 296
 - empty, 296
 - EQUAL, 295
 - getFamily, 297
 - getName, 297
 - getVersion, 297
 - GREATERTHAN, 295
 - GREATERTHANOREQUAL, 295
 - LESSTHAN, 295
 - LESSTHANOREQUAL, 295
 - NOTEQUAL, 295
 - operator std::string, 297
 - operator<, 298
 - operator<=, 300
 - operator<=, 298
 - operator>, 299
 - operator>=, 300
 - operator(), 298
 - operator==, 299
 - Software, 295, 296
 - toString, 300
 - VERSIONTOKENS, 301
- Arc::SoftwareRequirement, 301
 - add, 303
 - clear, 303
 - empty, 303
 - getComparisonOperatorList, 304

- getSoftwareList, 304
- isRequiringAll, 304
- isResolved, 304
- isSatisfied, 305, 306
- operator=, 306
- selectSoftware, 306, 307
- setRequirement, 308
- SoftwareRequirement, 302
- Arc::Submitter, 311
 - Migrate, 312
 - Submit, 312
- Arc::SubmitterLoader, 312
 - ~SubmitterLoader, 313
 - GetSubmitters, 313
 - load, 313
 - SubmitterLoader, 313
- Arc::SubmitterPluginArgument, 314
- Arc::TargetGenerator, 314
 - AddIndexServer, 315
 - AddJob, 315, 316
 - AddService, 316
 - AddTarget, 316
 - FoundJobs, 316
 - FoundTargets, 316
 - GetExecutionTargets, 317
 - GetFoundJobs, 317
 - GetJobs, 317
 - GetTargets, 317
 - ModifyFoundTargets, 318
 - PrintTargetInfo, 318
 - SaveTargetInfoToStream, 318
 - ServiceCounter, 318
 - TargetGenerator, 315
- Arc::TargetRetriever, 319
 - GetExecutionTargets, 320
 - GetJobs, 320
 - GetTargets, 320
 - TargetRetriever, 319
- Arc::TargetRetrieverLoader, 320
 - ~TargetRetrieverLoader, 321
 - GetTargetRetrievers, 321
 - load, 321
 - TargetRetrieverLoader, 321
- Arc::TargetRetrieverPluginArgument, 322
- Arc::ThreadDataItem, 323
 - Attach, 324
 - Dup, 324
 - Get, 325
 - ThreadDataItem, 324
- Arc::ThreadInitializer, 325
- Arc::ThreadRegistry, 325
 - WaitForExit, 325
 - WaitOrCancel, 325
- Arc::Time, 326
- GetFormat, 327
- GetTime, 327
- operator std::string, 327
- operator<, 327
- operator<=, 328
- operator>, 328
- operator>=, 328
- operator+, 327
- operator-, 327
- operator=, 328
- operator==, 328
- SetFormat, 328
- SetTime, 328
- str, 329
- Time, 327
- Arc::TimedMutex, 330
- Arc::URL, 330
 - ~URL, 332
 - AddLDAPAttribute, 332
 - AddMetaDataOption, 332
 - AddOption, 332
 - BaseDN2Path, 333
 - ChangeHost, 333
 - ChangeLDAPFilter, 333
 - ChangeLDAPScape, 333
 - ChangePath, 333
 - ChangePort, 333
 - ChangeProtocol, 333
 - CommonLocOption, 333
 - CommonLocOptions, 333
 - commonlocoptions, 337
 - ConnectionURL, 333
 - FullPath, 334
 - fullstr, 334
 - Host, 334
 - host, 337
 - HTTPOption, 334
 - HTTPOptions, 334
 - httpoptions, 337
 - ip6addr, 337
 - IsSecureProtocol, 334
 - LDAPAttributes, 334
 - ldapattributes, 337
 - LDAPFilter, 334
 - ldapfilter, 337
 - LDAPScape, 334
 - ldapscope, 337
 - Locations, 334
 - locations, 337
 - MetaDataOption, 335
 - MetaDataOptions, 335
 - metadataoptions, 337
 - operator bool, 335
 - operator<, 335

- operator<<, 336
- operator==, 335
- Option, 335
- Options, 335
- OptionString, 335
- ParseOptions, 335
- Passwd, 336
- passwd, 337
- Path, 336
- path, 337
- Path2BaseDN, 336
- plainstr, 336
- Port, 336
- port, 337
- Protocol, 336
- protocol, 338
- Scope, 332
- str, 336
- URL, 332
- urloptions, 338
- Username, 336
- username, 338
- valid, 338
- Arc::URLLocation, 338
 - ~URLLocation, 339
 - fullstr, 339
 - Name, 339
 - name, 340
 - str, 339
 - URLLocation, 339
- Arc::URLMap, 340
- Arc::User, 340
- Arc::UserConfig, 340
 - AddBartender, 345
 - AddServices, 345, 346
 - ApplyToConfig, 346
 - ARCUSERDIRECTORY, 367
 - Bartender, 347
 - Broker, 347, 348
 - CACertificatePath, 349
 - CACertificatesDirectory, 349, 350
 - CertificateLifeTime, 350
 - CertificatePath, 351
 - ClearRejectedServices, 351, 352
 - ClearSelectedServices, 352
 - CredentialsFound, 352
 - DEFAULT_BROKER, 367
 - DEFAULT_TIMEOUT, 367
 - DEFAULTCONFIG, 367
 - EXAMPLECONFIG, 367
 - GetRejectedServices, 353
 - GetSelectedServices, 353
 - IdPName, 353, 354
 - InitializeCredentials, 354
 - JobListFile, 355, 356
 - KeyPassword, 356
 - KeyPath, 357
 - KeySize, 357, 358
 - LoadConfigurationFile, 358
 - operator bool, 360
 - OverlayFile, 360
 - Password, 361
 - ProxyPath, 361, 362
 - SaveToFile, 362
 - SLCS, 362, 363
 - StoreDirectory, 363
 - SYSCONFIG, 367
 - SYSCONFIGARCLOC, 368
 - Timeout, 363, 364
 - UserConfig, 343–345
 - UserName, 364
 - UtilsDirPath, 365
 - Verbosity, 365, 366
 - VOMSServerPath, 366
- Arc::UsernameToken, 368
 - Authenticate, 369
 - operator bool, 369
 - PasswordType, 368
 - Username, 370
 - UsernameToken, 369
- Arc::UserSwitch, 370
- Arc::VOMSTrustList, 370
 - AddChain, 371
 - AddRegex, 371
 - VOMSTrustList, 371
- Arc::WSAEndpointReference, 372
 - ~WSAEndpointReference, 373
 - Address, 373
 - MetaData, 373
 - operator XMLNode, 373
 - operator=, 373
 - ReferenceParameters, 373
 - WSAEndpointReference, 372
- Arc::WSAHeader, 373
 - Action, 375
 - Check, 375
 - FaultTo, 375
 - From, 375
 - header_allocated_, 376
 - MessageID, 375
 - NewReferenceParameter, 375
 - operator XMLNode, 375
 - ReferenceParameter, 375
 - RelatesTo, 375, 376
 - RelationshipType, 376
 - ReplyTo, 376
 - To, 376
 - WSAHeader, 374

- Arc::WSRF, 376
 - allocated_, 378
 - operator bool, 378
 - set_namespaces, 378
 - SOAP, 378
 - valid_, 378
 - WSRF, 377
- Arc::WSRFBBaseFault, 378
 - set_namespaces, 379
 - WSRFBBaseFault, 379
- Arc::WSRFResourceUnavailableFault, 379
- Arc::WSRFResourceUnknownFault, 380
- Arc::WSRP, 380
 - set_namespaces, 382
 - WSRP, 381
- Arc::WSRPDeleteResourceProperties, 382
- Arc::WSRPDeleteResourcePropertiesRequest, 382
- Arc::WSRPDeleteResourcePropertiesRequestFailedFault, 383
- Arc::WSRPDeleteResourcePropertiesResponse, 383
- Arc::WSRPFault, 383
 - WSRPFault, 384
- Arc::WSRPGetMultipleResourcePropertiesRequest, 384
- Arc::WSRPGetMultipleResourcePropertiesResponse, 385
- Arc::WSRPGetResourcePropertyDocumentRequest, 385
- Arc::WSRPGetResourcePropertyDocumentResponse, 385
- Arc::WSRPGetResourcePropertyRequest, 386
- Arc::WSRPGetResourcePropertyResponse, 386
- Arc::WSRPInsertResourceProperties, 387
- Arc::WSRPInsertResourcePropertiesRequest, 387
- Arc::WSRPInsertResourcePropertiesRequestFailedFault, 387
- Arc::WSRPInsertResourcePropertiesResponse, 388
- Arc::WSRPInvalidModificationFault, 388
- Arc::WSRPInvalidResourcePropertyQNameFault, 389
- Arc::WSRPModifyResourceProperties, 389
- Arc::WSRPPutResourcePropertyDocumentRequest, 390
- Arc::WSRPPutResourcePropertyDocumentResponse, 390
- Arc::WSRPQueryResourcePropertiesRequest, 390
- Arc::WSRPQueryResourcePropertiesResponse, 391
- Arc::WSRPResourcePropertyChangeFailure, 391
 - WSRPResourcePropertyChangeFailure, 392
- Arc::WSRPSetResourcePropertiesRequest, 392
- Arc::WSRPSetResourcePropertiesResponse, 392
- Arc::WSRPSetResourcePropertyRequestFailedFault, 393
- Arc::WSRPUnableToModifyResourcePropertyFault, 393
- Arc::WSRPUnableToPutResourcePropertyDocumentFault, 394
- Arc::WSRPUpdateResourceProperties, 394
- Arc::WSRPUpdateResourcePropertiesRequest, 394
- Arc::WSRPUpdateResourcePropertiesRequestFailedFault, 395
- Arc::WSRPUpdateResourcePropertiesResponse, 395
- Arc::X509Token, 397
 - ~X509Token, 398
 - Authenticate, 398
 - operator bool, 398
 - X509Token, 397
 - X509TokenType, 397
- Arc::XmlContainer, 398
- Arc::XmlDatabase, 399
- Arc::XMLNode, 399
 - ~XMLNode, 402
 - Attribute, 402
 - AttributesSize, 402
 - Child, 402
 - Destroy, 402
 - Exchange, 403
 - FullName, 403
 - Get, 403
 - GetDoc, 403
 - GetRoot, 403
 - GetXML, 403
 - is_owner_, 410
 - is_temporary_, 410
 - MatchXMLName, 409
 - MatchXMLNamespace, 409, 410
 - Move, 403
 - Name, 404
 - Namespace, 404
 - NamespacePrefix, 404
 - Namespace, 404
 - New, 404
 - NewAttribute, 404, 405
 - NewChild, 405
 - operator bool, 405
 - operator std::string, 405
 - operator++, 406
 - operator--, 406
 - operator=, 406
 - operator==, 407
 - operator[], 407
 - Parent, 407
 - Path, 408
 - Prefix, 408

- ReadFromFile, 408
- ReadFromStream, 408
- Replace, 408
- Same, 408
- SaveToFile, 408
- SaveToStream, 408
- Set, 408
- Size, 408
- Swap, 409
- Validate, 409
- XMLNode, 401, 402
- XPathLookup, 409
- Arc::XMLNodeContainer, 410
 - Add, 411
 - AddNew, 411
 - Nodes, 411
 - operator=, 411
 - operator[], 411
 - Size, 411
 - XMLNodeContainer, 411
- Arc::XMLSecNode, 412
 - AddSignatureTemplate, 412
 - DecryptNode, 413
 - EncryptNode, 413
 - SignNode, 413
 - VerifyNode, 413
 - XMLSecNode, 412
- ArcCredential, 43
 - CERT_TYPE_CA, 44
 - CERT_TYPE_EEC, 44
 - CERT_TYPE_GSI_2_LIMITED_PROXY, 44
 - CERT_TYPE_GSI_2_PROXY, 44
 - CERT_TYPE_GSI_3_IMPERSONATION_PROXY, 44
 - CERT_TYPE_GSI_3_INDEPENDENT_PROXY, 44
 - CERT_TYPE_GSI_3_LIMITED_PROXY, 44
 - CERT_TYPE_GSI_3_RESTRICTED_PROXY, 44
 - CERT_TYPE_RFC_ANYLANGUAGE_PROXY, 44
 - CERT_TYPE_RFC_IMPERSONATION_PROXY, 44
 - CERT_TYPE_RFC_INDEPENDENT_PROXY, 44
 - CERT_TYPE_RFC_LIMITED_PROXY, 44
 - CERT_TYPE_RFC_RESTRICTED_PROXY, 44
 - certType, 44
- ArcCredential::ACACI, 45
- ArcCredential::ACATTHOLDER, 45
- ArcCredential::ACATTR, 45
- ArcCredential::ACATTRIBUTE, 45
- ArcCredential::ACC, 45
- ArcCredential::ACCERTS, 46
- ArcCredential::ACDIGEST, 46
- ArcCredential::ACFORM, 46
- ArcCredential::ACFULLATTRIBUTES, 46
- ArcCredential::ACHOLDER, 46
- ArcCredential::ACIETFATTR, 46
- ArcCredential::ACINFO, 46
- ArcCredential::ACIS, 47
- ArcCredential::ACSEQ, 47
- ArcCredential::ACTARGET, 47
- ArcCredential::ACTARGETS, 47
- ArcCredential::ACVAL, 47
- ArcCredential::cert_verify_context, 65
- ArcCredential::PROXYCERTINFO_st, 265
- ArcCredential::PROXYPOLICY_st, 265
- ArcSec::AlgFactory, 48
 - createAlg, 48
- ArcSec::AnyURIAttribute, 49
 - encode, 49
 - equal, 49
 - getId, 49
 - getType, 49
- ArcSec::ArcPeriod, 51
- ArcSec::Attr, 51
- ArcSec::AttributeFactory, 52
- ArcSec::AttributeProxy, 55
 - getAttribute, 55
- ArcSec::AttributeValue, 56
 - encode, 57
 - equal, 57
 - getId, 57
 - getType, 57
- ArcSec::Attrs, 57
- ArcSec::AuthzRequest, 58
- ArcSec::AuthzRequestSection, 58
- ArcSec::BooleanAttribute, 61
 - encode, 61
 - equal, 61
 - getId, 61
 - getType, 61
- ArcSec::CombiningAlg, 75
 - combine, 75
 - getalgId, 75
- ArcSec::DateAttribute, 134
 - encode, 134
 - equal, 134
 - getId, 134
 - getType, 134
- ArcSec::DateTimeAttribute, 135
 - encode, 135
 - equal, 135
 - getId, 135
 - getType, 135
- ArcSec::DenyOverridesCombiningAlg, 143

- combine, 144
- getalgId, 144
- ArcSec::DurationAttribute, 146
 - encode, 146
 - equal, 147
 - getId, 147
 - getType, 147
- ArcSec::EqualFunction, 147
 - evaluate, 148
 - getFunctionName, 148
- ArcSec::EvalResult, 148
- ArcSec::EvaluationCtx, 148
 - EvaluationCtx, 149
- ArcSec::Evaluator, 149
 - addPolicy, 150
 - evaluate, 150, 151
 - getAlgFactory, 151
 - getAttrFactory, 151
 - getFnFactory, 151
 - getName, 151
 - setCombiningAlg, 151
- ArcSec::EvaluatorContext, 152
 - operator AlgFactory *, 152
 - operator AttributeFactory *, 152
 - operator FnFactory *, 152
- ArcSec::EvaluatorLoader, 152
 - getEvaluator, 153
 - getPolicy, 153
 - getRequest, 153
- ArcSec::FnFactory, 165
 - createFn, 166
- ArcSec::Function, 166
 - evaluate, 167
- ArcSec::GenericAttribute, 167
 - encode, 167
 - equal, 167
 - getId, 168
 - getType, 168
- ArcSec::InRangeFunction, 179
 - evaluate, 179
- ArcSec::MatchFunction, 206
 - evaluate, 207
 - getFunctionName, 207
- ArcSec::OrderedCombiningAlg, 234
- ArcSec::PDP, 248
- ArcSec::PDPCongContext, 248
- ArcSec::PDPPluginArgument, 249
- ArcSec::PeriodAttribute, 251
 - encode, 251
 - equal, 251
 - getId, 251
 - getType, 252
- ArcSec::PermitOverridesCombiningAlg, 252
 - combine, 252
 - getalgId, 253
- ArcSec::Policy, 260
 - addPolicy, 261
 - eval, 261
 - getEffect, 261
 - getEvalName, 261
 - getEvalResult, 262
 - getName, 262
 - make_policy, 262
 - Policy, 261
 - setEvalResult, 262
 - setEvaluatorContext, 262
- ArcSec::PolicyParser, 262
 - parsePolicy, 263
- ArcSec::PolicyStore, 263
 - PolicyStore, 263
- ArcSec::PolicyStore::PolicyElement, 262
- ArcSec::Request, 269
 - addRequestItem, 270
 - getEvalName, 270
 - getName, 270
 - getRequestItems, 270
 - make_request, 271
 - Request, 270
 - setAttributeFactory, 271
 - setRequestItems, 271
- ArcSec::RequestAttribute, 271
 - duplicate, 272
 - RequestAttribute, 271
- ArcSec::RequestItem, 272
 - RequestItem, 272
- ArcSec::RequestTuple, 272
- ArcSec::Response, 273
- ArcSec::ResponseItem, 273
- ArcSec::ResponseList, 274
- ArcSec::SecHandler, 286
- ArcSec::SecHandlerConfig, 287
- ArcSec::SecHandlerPluginArgument, 287
- ArcSec::Security, 288
- ArcSec::Source, 308
 - Source, 309
- ArcSec::SourceFile, 309
- ArcSec::SourceURL, 310
- ArcSec::StringAttribute, 310
 - encode, 311
 - equal, 311
 - getId, 311
 - getType, 311
- ArcSec::TimeAttribute, 329
 - encode, 329
 - equal, 329
 - getId, 329
 - getType, 330
- ArcSec::X500NameAttribute, 396

- encode, 396
 - equal, 396
 - getId, 396
 - getType, 396
- ARCUSERDIRECTORY
 - Arc::UserConfig, 367
- Assign
 - Arc::InformationContainer, 175
- AssignStderr
 - Arc::Run, 275
- AssignStdin
 - Arc::Run, 275
- AssignStdout
 - Arc::Run, 275
- AssignWorkingDirectory
 - Arc::Run, 275
- Attach
 - Arc::ThreadDataItem, 324
- AttrConstIter
 - Arc, 35
- Attribute
 - Arc::XMLNode, 402
- AttributeIterator
 - Arc::AttributeIterator, 53
- Attributes
 - Arc::Message, 217
 - Arc::SOAPMessage, 293
- attributes_
 - Arc::MessageAttributes, 221
- AttributesSize
 - Arc::XMLNode, 402
- AttrIter
 - Arc, 35
- AttrMap
 - Arc, 35
- Auth
 - Arc::Message, 217
- AuthContext
 - Arc::Message, 217
- Authenticate
 - Arc::SAMLToken, 282
 - Arc::UsernameToken, 369
 - Arc::X509Token, 398
- Backup
 - Arc::DelegationConsumer, 137
- Bartender
 - Arc::UserConfig, 347
- BaseDN2Path
 - Arc::URL, 333
- broadcast
 - Arc::SimpleCondition, 291
- Broker
 - Arc::UserConfig, 347, 348
- BrokerLoader
 - Arc::BrokerLoader, 64
- Buffer
 - Arc::PayloadRaw, 236
 - Arc::PayloadRawInterface, 239
- buffer_size
 - Arc::DataBuffer, 101
- BufferPos
 - Arc::PayloadRaw, 236
 - Arc::PayloadRawInterface, 239
- BufferSize
 - Arc::PayloadRaw, 236
 - Arc::PayloadRawInterface, 239
- BUSY_ERROR
 - Arc, 36
- CACertificatePath
 - Arc::UserConfig, 349
- CACertificatesDirectory
 - Arc::UserConfig, 349, 350
- CacheError
 - Arc::DataStatus, 133
- cancel
 - Arc::Counter, 83
 - Arc::CounterTicket, 88
 - Arc::IntraProcessCounter, 181
- Cat
 - Arc::JobController, 187
- CERT_TYPE_CA
 - ArcCredential, 44
- CERT_TYPE_EEC
 - ArcCredential, 44
- CERT_TYPE_GSI_2_LIMITED_PROXY
 - ArcCredential, 44
- CERT_TYPE_GSI_2_PROXY
 - ArcCredential, 44
- CERT_TYPE_GSI_3_IMPERSONATION_PROXY
 - ArcCredential, 44
- CERT_TYPE_GSI_3_INDEPENDENT_PROXY
 - ArcCredential, 44
- CERT_TYPE_GSI_3_LIMITED_PROXY
 - ArcCredential, 44
- CERT_TYPE_GSI_3_RESTRICTED_PROXY
 - ArcCredential, 44
- CERT_TYPE_RFC_ANYLANGUAGE_PROXY
 - ArcCredential, 44
- CERT_TYPE_RFC_IMPERSONATION_PROXY
 - ArcCredential, 44
- CERT_TYPE_RFC_INDEPENDENT_PROXY
 - ArcCredential, 44
- CERT_TYPE_RFC_LIMITED_PROXY
 - ArcCredential, 44
- CERT_TYPE_RFC_RESTRICTED_PROXY
 - ArcCredential, 44

- ArcCredential, 44
- CertificateLifeTime
 - Arc::UserConfig, 350
- CertificatePath
 - Arc::UserConfig, 351
- certType
 - ArcCredential, 44
- changeExcess
 - Arc::Counter, 83
 - Arc::IntraProcessCounter, 181
- ChangeHost
 - Arc::URL, 333
- ChangeLDAPFilter
 - Arc::URL, 333
- ChangeLDAPScope
 - Arc::URL, 333
- changeLimit
 - Arc::Counter, 83
 - Arc::IntraProcessCounter, 181
- ChangePath
 - Arc::URL, 333
- ChangePort
 - Arc::URL, 333
- ChangeProtocol
 - Arc::URL, 333
- Check
 - Arc::DataPoint, 111
 - Arc::DataPointIndex, 124
 - Arc::WSAHeader, 375
- CheckCreated
 - Arc::FileCache, 161
- CheckDN
 - Arc::FileCache, 161
- CheckError
 - Arc::DataStatus, 133
- checks
 - Arc::DataMover, 106
- checksum_object
 - Arc::DataBuffer, 101
- checksum_valid
 - Arc::DataBuffer, 102
- CheckValid
 - Arc::FileCache, 161
- Child
 - Arc::XMLNode, 402
- CIStrngValue
 - Arc::CIStrngValue, 67
- clear
 - Arc::SoftwareRequirement, 303
- ClearRejectedServices
 - Arc::UserConfig, 351, 352
- ClearSelectedServices
 - Arc::UserConfig, 352
- ClientHTTPwithSAML2SSO
 - Arc::ClientHTTPwithSAML2SSO, 69
- ClientSOAP
 - Arc::ClientSOAP, 71
- ClientSOAPwithSAML2SSO
 - Arc::ClientSOAPwithSAML2SSO, 72
- ClientX509Delegation
 - Arc::ClientX509Delegation, 74
- close
 - Arc::Database, 99
 - Arc::MySQLDatabase, 228
- CloseStderr
 - Arc::Run, 275
- CloseStdin
 - Arc::Run, 276
- CloseStdout
 - Arc::Run, 276
- combine
 - ArcSec::CombiningAlg, 75
 - ArcSec::DenyOverridesCombiningAlg, 144
 - ArcSec::PermitOverridesCombiningAlg, 252
- CommonLocOption
 - Arc::URL, 333
- CommonLocOptions
 - Arc::URL, 333
- commonlocoptions
 - Arc::URL, 337
- CompareLocationMetadata
 - Arc::DataPoint, 112
 - Arc::DataPointDirect, 119
 - Arc::DataPointIndex, 124
- CompareMeta
 - Arc::DataPoint, 112
- ComparisonOperator
 - Arc::Software, 295
- ComparisonOperatorEnum
 - Arc::Software, 295
- ComputingShareName
 - Arc::ExecutionTarget, 156
- Config
 - Arc::Config, 76, 77
- ConfusaCertHandler
 - Arc::ConfusaCertHandler, 78
- connect
 - Arc::Database, 99
 - Arc::MySQLDatabase, 228
- ConnectionURL
 - Arc::URL, 333
- Content
 - Arc::PayloadRaw, 236
 - Arc::PayloadRawInterface, 239
- ContentFromPayload
 - Arc, 37
- Context
 - Arc::Message, 218

- context_lock_
 - Arc::DelegationContainerSOAP, 140
- convert
 - Arc::Software, 296
- Copy
 - Arc::FileCache, 161
- count
 - Arc::MessageAttributes, 219
- Counter
 - Arc::Counter, 82
- CounterTicket
 - Arc::CounterTicket, 88
- createAlg
 - ArcSec::AlgFactory, 48
- createCertRequest
 - Arc::ConfusaCertHandler, 78
- createDelegation
 - Arc::ClientX509Delegation, 74
- createFn
 - ArcSec::FnFactory, 166
- CreateThreadFunction
 - Arc, 37
- createVOMSAC
 - Arc, 37
- Credential
 - Arc::Credential, 90, 91
- CredentialError
 - Arc::CredentialError, 97
- CredentialLogger
 - Arc, 42
- CredentialsExpiredError
 - Arc::DataStatus, 133
- CredentialsFound
 - Arc::UserConfig, 352
- current_
 - Arc::AttributeIterator, 55
- CurrentLocationMetadata
 - Arc::DataPoint, 112
 - Arc::DataPointDirect, 119
 - Arc::DataPointIndex, 124
- Database
 - Arc::Database, 98
- DataBuffer
 - Arc::DataBuffer, 101
- DataPoint
 - Arc::DataPoint, 111
- DataPointAccessLatency
 - Arc::DataPoint, 110
- DataPointInfoType
 - Arc::DataPoint, 110
- DataSpeed
 - Arc::DataSpeed, 129
- DataStatusType
 - Arc::DataStatus, 132
- DecryptNode
 - Arc::XMLSecNode, 413
- DEFAULT_BROKER
 - Arc::UserConfig, 367
- DEFAULT_TIMEOUT
 - Arc::UserConfig, 367
- DEFAULTCONFIG
 - Arc::UserConfig, 367
- Delegate
 - Arc::DelegationProvider, 141
- DelegateCredentialsInit
 - Arc::DelegationConsumerSOAP, 138
 - Arc::DelegationContainerSOAP, 140
 - Arc::DelegationProviderSOAP, 143
- DelegatedToken
 - Arc::DelegationConsumerSOAP, 138
 - Arc::DelegationContainerSOAP, 140
 - Arc::DelegationProviderSOAP, 143
- DelegationConsumer
 - Arc::DelegationConsumer, 137
- DelegationConsumerSOAP
 - Arc::DelegationConsumerSOAP, 138
- DelegationProvider
 - Arc::DelegationProvider, 141
- DelegationProviderSOAP
 - Arc::DelegationProviderSOAP, 142
- DeleteError
 - Arc::DataStatus, 133
- Destroy
 - Arc::XMLNode, 402
- destroy_doc
 - Arc::ConfusaParserUtils, 79
- doc_
 - Arc::InformationContainer, 175
- Dup
 - Arc::ThreadDataItem, 324
- duplicate
 - ArcSec::RequestAttribute, 272
- empty
 - Arc::Software, 296
 - Arc::SoftwareRequirement, 303
- enable_ssl
 - Arc::Database, 99
 - Arc::MySQLDatabase, 228
- encode
 - ArcSec::AnyURIAttribute, 49
 - ArcSec::AttributeValue, 57
 - ArcSec::BooleanAttribute, 61
 - ArcSec::DateAttribute, 134
 - ArcSec::DateTimeAttribute, 135
 - ArcSec::DurationAttribute, 146
 - ArcSec::GenericAttribute, 167

- ArcSec::PeriodAttribute, 251
- ArcSec::StringAttribute, 311
- ArcSec::TimeAttribute, 329
- ArcSec::X500NameAttribute, 396
- EncryptNode
 - Arc::XMLSecNode, 413
- end_
 - Arc::AttributeIterator, 55
- eof_read
 - Arc::DataBuffer, 102
- eof_write
 - Arc::DataBuffer, 102
- EQUAL
 - Arc::Software, 295
- equal
 - Arc::CStringValue, 68
 - ArcSec::AnyURIAttribute, 49
 - ArcSec::AttributeValue, 57
 - ArcSec::BooleanAttribute, 61
 - ArcSec::DateAttribute, 134
 - ArcSec::DateTimeAttribute, 135
 - ArcSec::DurationAttribute, 147
 - ArcSec::GenericAttribute, 167
 - ArcSec::PeriodAttribute, 251
 - ArcSec::StringAttribute, 311
 - ArcSec::TimeAttribute, 329
 - ArcSec::X500NameAttribute, 396
- error
 - Arc::DataBuffer, 102
- error_read
 - Arc::DataBuffer, 102
- error_write
 - Arc::DataBuffer, 102
- eval
 - ArcSec::Policy, 261
- evaluate
 - ArcSec::EqualFunction, 148
 - ArcSec::Evaluator, 150, 151
 - ArcSec::Function, 167
 - ArcSec::InRangeFunction, 179
 - ArcSec::MatchFunction, 207
- evaluate_path
 - Arc::ConfusaParserUtils, 79
- EvaluationCtx
 - ArcSec::EvaluationCtx, 149
- EXAMPLECONFIG
 - Arc::UserConfig, 367
- Exchange
 - Arc::XMLNode, 403
- execute
 - Arc::MySQLQuery, 229
 - Arc::Query, 266
- ExecutionTarget
 - Arc::ExecutionTarget, 154, 155
- Export
 - Arc::MessageAuth, 222
 - Arc::MultiSecAttr, 227
 - Arc::SecAttr, 284
- extend
 - Arc::Counter, 83
 - Arc::CounterTicket, 88
 - Arc::IntraProcessCounter, 181
- extract_body_information
 - Arc::ConfusaParserUtils, 79
- factory_
 - Arc::Loader, 196
- FaultTo
 - Arc::WSAHeader, 375
- File
 - Arc::FileCache, 161
- FileCache
 - Arc::FileCache, 160
- FileCacheHash, 163
 - getHash, 164
 - maxLength, 164
- FileOpen
 - Arc, 37
- FillJobStore
 - Arc::JobController, 188
- Filter
 - Arc::InfoFilter, 171
 - Arc::MessageAuth, 222
- FilterByKind
 - Arc::PluginsFactory, 259
- final_xmlsec
 - Arc, 37
- find
 - Arc::ModuleManager, 225
- findLocation
 - Arc::ModuleManager, 225
- findSimpleSAMLInstallation
 - Arc::SAML2LoginClient, 278
- for_read
 - Arc::DataBuffer, 103
- for_write
 - Arc::DataBuffer, 103
- force_to_meta
 - Arc::DataMover, 106
- FoundJobs
 - Arc::TargetGenerator, 316
- FoundTargets
 - Arc::TargetGenerator, 316
- FreeSlotsWithDuration
 - Arc::ExecutionTarget, 156
- From
 - Arc::WSAHeader, 375
- FullName

- Arc::XMLNode, 403
- FullPath
 - Arc::URL, 334
- fullstr
 - Arc::URL, 334
 - Arc::URLLocation, 339
- Generate
 - Arc::DelegationConsumer, 137
- GenerateEECRequest
 - Arc::Credential, 92
- GenerateRequest
 - Arc::Credential, 92, 93
- GENERIC_ERROR
 - Arc, 36
- Get
 - Arc::InfoCacheInterface, 170
 - Arc::InformationContainer, 175
 - Arc::InformationInterface, 176
 - Arc::PayloadStream, 242
 - Arc::PayloadStreamInterface, 245
 - Arc::ThreadDataItem, 325
 - Arc::XMLNode, 403
- get
 - Arc::MessageAttributes, 220
- get_array
 - Arc::MySQLQuery, 229
 - Arc::Query, 266
- get_cert_str
 - Arc, 38
- get_doc
 - Arc::ConfusaParserUtils, 79
- get_factory
 - Arc::PluginArgument, 257
- get_key_from_certfile
 - Arc, 38
- get_key_from_certstr
 - Arc, 38
- get_key_from_keyfile
 - Arc, 38
- get_key_from_keyst
 - Arc, 38
- get_module
 - Arc::PluginArgument, 257
- get_node
 - Arc, 38
- get_num_columns
 - Arc::MySQLQuery, 229
 - Arc::Query, 266
- get_num_rows
 - Arc::MySQLQuery, 230
 - Arc::Query, 266
- get_plugin_instance
 - Arc, 35
- get_property
 - Arc, 38
- get_row
 - Arc::MySQLQuery, 230
 - Arc::Query, 266, 267
- get_row_field
 - Arc::MySQLQuery, 230
 - Arc::Query, 267
- getAlgFactory
 - ArcSec::Evaluator, 151
- getalgId
 - ArcSec::CombiningAlg, 75
 - ArcSec::DenyOverridesCombiningAlg, 144
 - ArcSec::PermitOverridesCombiningAlg, 253
- getAll
 - Arc::MessageAttributes, 220
- getAttrFactory
 - ArcSec::Evaluator, 151
- getAttribute
 - ArcSec::AttributeProxy, 55
- GetBestTarget
 - Arc::Broker, 62
- GetBrokers
 - Arc::BrokerLoader, 64
- GetCert
 - Arc::Credential, 93
- GetCertNumofChain
 - Arc::Credential, 93
- GetCertReq
 - Arc::Credential, 93
- getCertRequestB64
 - Arc::ConfusaCertHandler, 78
- getComparisonOperatorList
 - Arc::SoftwareRequirement, 304
- getCounterTicket
 - Arc::Counter, 84
- GetCreated
 - Arc::FileCache, 161
- getCurrentTime
 - Arc::Counter, 84
- getDestinations
 - Arc::Logger, 201
- GetDN
 - Arc::Credential, 93
- GetDoc
 - Arc::XMLNode, 403
- getEffect
 - ArcSec::Policy, 261
- GetEndTime
 - Arc::Credential, 93
- GetEntry
 - Arc::ClientSOAP, 71
- getEvalName
 - ArcSec::Policy, 261

- ArcSec::Request, 270
- getEvalResult
 - ArcSec::Policy, 262
- getEvaluator
 - ArcSec::EvaluatorLoader, 153
- getExcess
 - Arc::Counter, 84
 - Arc::IntraProcessCounter, 182
- GetExecutionTargets
 - Arc::TargetGenerator, 317
 - Arc::TargetRetriever, 320
- getExpirationReminder
 - Arc::Counter, 85
- getExpiryTime
 - Arc::Counter, 85
 - Arc::ExpirationReminder, 158
- getExplanation
 - Arc::MCC_Status, 211
- GetFailureReason
 - Arc::DataPoint, 112
- getFamily
 - Arc::Software, 297
- getFileName
 - Arc::Config, 77
- getFnFactory
 - ArcSec::Evaluator, 151
- GetFormat
 - Arc::Time, 327
- getFormat
 - Arc::Credential, 93
- GetFoundJobs
 - Arc::TargetGenerator, 317
- getFunctionName
 - ArcSec::EqualFunction, 148
 - ArcSec::MatchFunction, 207
- getHash
 - FileCacheHash, 164
- getID
 - Arc::Service, 289
- getId
 - ArcSec::AnyURIAttribute, 49
 - ArcSec::AttributeValue, 57
 - ArcSec::BooleanAttribute, 61
 - ArcSec::DateAttribute, 134
 - ArcSec::DateTimeAttribute, 135
 - ArcSec::DurationAttribute, 147
 - ArcSec::GenericAttribute, 168
 - ArcSec::PeriodAttribute, 251
 - ArcSec::StringAttribute, 311
 - ArcSec::TimeAttribute, 329
 - ArcSec::X500NameAttribute, 396
- GetIdentityName
 - Arc::Credential, 93
- GetJobControllers
 - Arc::JobControllerLoader, 190
 - Arc::JobSupervisor, 195
- GetJobDescriptionParsers
 - Arc::JobDescriptionParserLoader, 193
- GetJobs
 - Arc::TargetGenerator, 317
 - Arc::TargetRetriever, 320
- getKind
 - Arc::MCC_Status, 211
- getLevel
 - Arc::LogMessage, 204
- GetLifeTime
 - Arc::Credential, 93
- getLimit
 - Arc::Counter, 85
 - Arc::IntraProcessCounter, 182
- getName
 - Arc::Software, 297
 - ArcSec::Evaluator, 151
 - ArcSec::Policy, 262
 - ArcSec::Request, 270
- getOrigin
 - Arc::MCC_Status, 211
- GetOverlay
 - Arc::BaseConfig, 60
- GetPeriod
 - Arc::Period, 250
- GetPlugins
 - Arc::ArcLocation, 51
- getPolicy
 - ArcSec::EvaluatorLoader, 153
- GetPrivKey
 - Arc::Credential, 93
- GetProxyPolicy
 - Arc::Credential, 94
- GetPubKey
 - Arc::Credential, 94
- GetRejectedServices
 - Arc::UserConfig, 353
- getRequest
 - ArcSec::EvaluatorLoader, 153
- getRequestItems
 - ArcSec::Request, 270
- getReservationID
 - Arc::ExpirationReminder, 158
- GetRoot
 - Arc::XMLNode, 403
- getRootLogger
 - Arc::Logger, 201
- GetSelectedServices
 - Arc::UserConfig, 353
- getSoftwareList
 - Arc::SoftwareRequirement, 304
- GetStartTime

- Arc::Credential, 94
- GetSubmitter
 - Arc::ExecutionTarget, 155
- GetSubmitters
 - Arc::SubmitterLoader, 313
- GetTargetRetrievers
 - Arc::TargetRetrieverLoader, 321
- GetTargets
 - Arc::TargetGenerator, 317
 - Arc::TargetRetriever, 320
- getThreshold
 - Arc::Logger, 201
- GetTime
 - Arc::Time, 327
- GetType
 - Arc::Credential, 94
- getType
 - ArcSec::AnyURIAttribute, 49
 - ArcSec::AttributeValue, 57
 - ArcSec::BooleanAttribute, 61
 - ArcSec::DateAttribute, 134
 - ArcSec::DateTimeAttribute, 135
 - ArcSec::DurationAttribute, 147
 - ArcSec::GenericAttribute, 168
 - ArcSec::PeriodAttribute, 252
 - ArcSec::StringAttribute, 311
 - ArcSec::TimeAttribute, 330
 - ArcSec::X500NameAttribute, 396
- GetValid
 - Arc::FileCache, 162
- getValue
 - Arc::Counter, 85
 - Arc::IntraProcessCounter, 182
- GetVerification
 - Arc::Credential, 94
- getVersion
 - Arc::Software, 297
- GetXML
 - Arc::XMLNode, 403
- GREATERTHAN
 - Arc::Software, 295
- GREATERTHANOREQUAL
 - Arc::Software, 295
- GUID
 - Arc, 38
- handle_
 - Arc::PayloadStream, 244
- handle_redirect_step
 - Arc::ConfusaParserUtils, 79
- hasMore
 - Arc::AttributeIterator, 53
- header_allocated_
 - Arc::WSAHeader, 376
- hold
 - Arc::DataSpeed, 130
- Host
 - Arc::URL, 334
- host
 - Arc::URL, 337
- HTTPOption
 - Arc::URL, 334
- HTTPOptions
 - Arc::URL, 334
- httpoptions
 - Arc::URL, 337
- ID
 - Arc::DelegationConsumer, 137
 - Arc::DelegationProviderSOAP, 143
- IdPName
 - Arc::UserConfig, 353, 354
- IDType
 - Arc::Counter, 82
- Import
 - Arc::SecAttr, 284
- InconsistentMetadataError
 - Arc::DataStatus, 133
- INFO_TYPE_ACCESS
 - Arc::DataPoint, 111
- INFO_TYPE_ALL
 - Arc::DataPoint, 111
- INFO_TYPE_CONTENT
 - Arc::DataPoint, 111
- INFO_TYPE_NAME
 - Arc::DataPoint, 111
- INFO_TYPE_REST
 - Arc::DataPoint, 111
- INFO_TYPE_STRUCT
 - Arc::DataPoint, 111
- INFO_TYPE_TIMES
 - Arc::DataPoint, 111
- INFO_TYPE_TYPE
 - Arc::DataPoint, 111
- InfoCache
 - Arc::InfoCache, 170
- InfoFilter
 - Arc::InfoFilter, 171
- InfoRegisters
 - Arc::InfoRegisters, 173
- InformationContainer
 - Arc::InformationContainer, 175
- InformationInterface
 - Arc::InformationInterface, 176
- InformationRequest
 - Arc::InformationRequest, 177
- InformationResponse
 - Arc::InformationResponse, 178

- Init
 - Arc::ArcLocation, 51
- init_xmlsec
 - Arc, 38
- InitializeCredentials
 - Arc::UserConfig, 354
- InitProxyCertInfo
 - Arc::Credential, 94
- InquireRequest
 - Arc::Credential, 94
- Insert
 - Arc::PayloadRaw, 237
 - Arc::PayloadRawInterface, 239
- IntraProcessCounter
 - Arc::IntraProcessCounter, 180
- ip6addr
 - Arc::URL, 337
- is_notwritten
 - Arc::DataBuffer, 103
- is_owner_
 - Arc::XMLNode, 410
- is_read
 - Arc::DataBuffer, 104
- is_temporary_
 - Arc::XMLNode, 410
- is_written
 - Arc::DataBuffer, 104
- isconnected
 - Arc::Database, 99
 - Arc::MySQLDatabase, 228
- IsCredentialsValid
 - Arc::Credential, 94
- isOk
 - Arc::MCC_Status, 211
- IsReadingError
 - Arc::DataStatus, 133
- isRequiringAll
 - Arc::SoftwareRequirement, 304
- isResolved
 - Arc::SoftwareRequirement, 304
- isSatisfied
 - Arc::SoftwareRequirement, 305, 306
- IsSecureProtocol
 - Arc::URL, 334
- istr
 - Arc::Period, 250
- istring_to_level
 - Arc, 38
- IsValid
 - Arc::Credential, 95
- isValid
 - Arc::CounterTicket, 88
- IsWritingError
 - Arc::DataStatus, 133
- Job
 - Arc::Job, 185
- JobControllerLoader
 - Arc::JobControllerLoader, 190
- JobDescriptionParserLoader
 - Arc::JobDescriptionParserLoader, 193
- JobListFile
 - Arc::UserConfig, 355, 356
- JobSupervisor
 - Arc::JobSupervisor, 194
- KeepStderr
 - Arc::Run, 276
- KeepStdin
 - Arc::Run, 276
- KeepStdout
 - Arc::Run, 276
- key
 - Arc::AttributeIterator, 54
- KeyPassword
 - Arc::UserConfig, 356
- KeyPath
 - Arc::UserConfig, 357
- KeySize
 - Arc::UserConfig, 357, 358
- Kill
 - Arc::Run, 276
- LDAPAttributes
 - Arc::URL, 334
- ldapattributes
 - Arc::URL, 337
- LDAPFilter
 - Arc::URL, 334
- ldapfilter
 - Arc::URL, 337
- LDAPSscope
 - Arc::URL, 334
- ldapscope
 - Arc::URL, 337
- length
 - Arc::PayloadRawBuf, 238
- LESSTHAN
 - Arc::Software, 295
- LESSTHANOREQUAL
 - Arc::Software, 295
- Limit
 - Arc::PayloadStream, 242
 - Arc::PayloadStreamInterface, 245
- Link
 - Arc::FileCache, 162
- List
 - Arc::DataPoint, 112
- ListError

- Arc::DataStatus, 133
- Load
 - Arc::ClientSOAP, 71
- load
 - Arc::BrokerLoader, 64
 - Arc::JobControllerLoader, 190
 - Arc::JobDescriptionParserLoader, 193
 - Arc::ModuleManager, 225
 - Arc::PluginsFactory, 259
 - Arc::SubmitterLoader, 313
 - Arc::TargetRetrieverLoader, 321
- load_key_from_certfile
 - Arc, 39
- load_key_from_certstr
 - Arc, 39
- load_key_from_keyfile
 - Arc, 39
- load_trusted_cert_file
 - Arc, 39
- load_trusted_cert_str
 - Arc, 39
- load_trusted_certs
 - Arc, 39
- LoadConfigurationFile
 - Arc::UserConfig, 358
- Loader
 - Arc::Loader, 196
- LocationAlreadyExistsError
 - Arc::DataStatus, 133
- Locations
 - Arc::URL, 334
- locations
 - Arc::URL, 337
- lock
 - Arc::SimpleCondition, 291
- lock_
 - Arc::InformationInterface, 176
- log
 - Arc::LogFile, 198
 - Arc::LogStream, 206
- LogDestination
 - Arc::LogDestination, 197
- LogError
 - Arc::Credential, 95
 - Arc::DelegationConsumer, 137
- LogFile
 - Arc::LogFile, 198
- Logger
 - Arc::Logger, 200
 - Arc::LogMessage, 205
- logger
 - Arc::MCC, 209
 - Arc::Plexer, 254
 - Arc::Service, 290
- LogLevel
 - Arc, 36
- LogMessage
 - Arc::LogMessage, 204
- LogStream
 - Arc::LogStream, 206
- make_policy
 - ArcSec::Policy, 262
- make_request
 - ArcSec::Request, 271
- MakeConfig
 - Arc::BaseConfig, 60
 - Arc::MCCConfig, 213
- makePersistent
 - Arc::ModuleManager, 225, 226
- match
 - Arc::RegularExpression, 269
- MatchXMLName
 - Arc, 39, 40
 - Arc::XMLNode, 409
- MatchXMLNamespace
 - Arc, 40
 - Arc::XMLNode, 409, 410
- max_duration_
 - Arc::DelegationContainerSOAP, 140
- max_size_
 - Arc::DelegationContainerSOAP, 140
- max_usage_
 - Arc::DelegationContainerSOAP, 140
- MaxDiskSpace
 - Arc::ExecutionTarget, 156
- maxLength
 - FileCacheHash, 164
- MaxMainMemory
 - Arc::ExecutionTarget, 157
- MaxVirtualMemory
 - Arc::ExecutionTarget, 157
- MCC
 - Arc::MCC, 208
- MCC_Status
 - Arc::MCC_Status, 210
- MCCLoader
 - Arc::MCCLoader, 215
- Message
 - Arc::Message, 217
- MessageAttributes
 - Arc::AttributeIterator, 54
 - Arc::MessageAttributes, 219
- MessageID
 - Arc::WSAHeader, 375
- MetaData
 - Arc::WSAEndpointReference, 373
- MetaDataOption

- Arc::URL, 335
- MetaDataOptions
 - Arc::URL, 335
- metadataoptions
 - Arc::URL, 337
- Migrate
 - Arc::JobController, 188
 - Arc::Submitter, 312
- ModifyFoundTargets
 - Arc::TargetGenerator, 318
- ModuleManager
 - Arc::ModuleManager, 225
- Move
 - Arc::XMLNode, 403
- msg
 - Arc::Logger, 201
- Name
 - Arc::URLLocation, 339
 - Arc::XMLNode, 404
- name
 - Arc::URLLocation, 340
- Namespace
 - Arc::XMLNode, 404
- NamespacePrefix
 - Arc::XMLNode, 404
- Namespaces
 - Arc::XMLNode, 404
- New
 - Arc::XMLNode, 404
- NewAttribute
 - Arc::XMLNode, 404, 405
- NewChild
 - Arc::XMLNode, 405
- NewReferenceParameter
 - Arc::WSAHeader, 375
- Next
 - Arc::MCC, 209
 - Arc::Plexer, 254
- next_
 - Arc::MCC, 209
- NextLocation
 - Arc::DataPoint, 112
 - Arc::DataPointDirect, 119
 - Arc::DataPointIndex, 125
- Nodes
 - Arc::XMLNodeContainer, 411
- NoLocationError
 - Arc::DataStatus, 133
- NOTEQUAL
 - Arc::Software, 295
- NotInitializedError
 - Arc::DataStatus, 133
- NotSupportedForDirectDataPointsError
 - Arc::DataStatus, 133
- OAuthConsumer
 - Arc::OAuthConsumer, 232
- OpenSSLInit
 - Arc, 40
- OperatingSystem
 - Arc::ExecutionTarget, 157
- operator AlgFactory *
 - ArcSec::EvaluatorContext, 152
- operator AttributeFactory *
 - ArcSec::EvaluatorContext, 152
- operator bool
 - Arc::CStringValue, 68
 - Arc::FileCache, 162
 - Arc::MCC_Status, 211
 - Arc::MultiSecAttr, 227
 - Arc::PathIterator, 235
 - Arc::PayloadStream, 243
 - Arc::PayloadStreamInterface, 245
 - Arc::Run, 276
 - Arc::SAMLToken, 282
 - Arc::SecAttr, 284
 - Arc::SecAttrValue, 286
 - Arc::URL, 335
 - Arc::UserConfig, 360
 - Arc::UsernameToken, 369
 - Arc::WSRF, 378
 - Arc::X509Token, 398
 - Arc::XMLNode, 405
- operator FnFactory *
 - ArcSec::EvaluatorContext, 152
- operator PluginsFactory *
 - Arc::ChainContext, 66
- operator std::string
 - Arc::MCC_Status, 212
 - Arc::Period, 250
 - Arc::Software, 297
 - Arc::Time, 327
 - Arc::XMLNode, 405
- operator XMLNode
 - Arc::WSAEndpointReference, 373
 - Arc::WSAHeader, 375
- operator <
 - Arc::ExpirationReminder, 158
 - Arc::Period, 250
 - Arc::Software, 298
 - Arc::Time, 327
 - Arc::URL, 335
- operator <<
 - Arc, 40
 - Arc::LogMessage, 205
 - Arc::Software, 300
 - Arc::URL, 336

- operator<=
 - Arc::Period, 250
 - Arc::Software, 298
 - Arc::Time, 328
- operator>
 - Arc::Period, 250
 - Arc::Software, 299
 - Arc::Time, 328
- operator>=
 - Arc::Period, 250
 - Arc::Software, 300
 - Arc::Time, 328
- operator*
 - Arc::AttributeIterator, 54
 - Arc::PathIterator, 235
- operator()
 - Arc::Software, 298
- operator+
 - Arc::Time, 327
- operator++
 - Arc::AttributeIterator, 54
 - Arc::PathIterator, 235
 - Arc::XMLNode, 406
- operator-
 - Arc::Time, 327
- operator->
 - Arc::AttributeIterator, 54
- operator--
 - Arc::PathIterator, 235
 - Arc::XMLNode, 406
- operator=
 - Arc::ExecutionTarget, 155
 - Arc::Job, 185
 - Arc::Message, 218
 - Arc::Period, 250
 - Arc::SoftwareRequirement, 306
 - Arc::Time, 328
 - Arc::WSAEndpointReference, 373
 - Arc::XMLNode, 406
 - Arc::XMLNodeContainer, 411
- operator==
 - Arc::FileCache, 162
 - Arc::Period, 250
 - Arc::SecAttr, 284
 - Arc::SecAttrValue, 286
 - Arc::Software, 299
 - Arc::Time, 328
 - Arc::URL, 335
 - Arc::XMLNode, 407
- operator[]
 - Arc::MCCLoader, 215
 - Arc::PayloadRaw, 237
 - Arc::PayloadRawInterface, 239
 - Arc::XMLNode, 407
 - Arc::XMLNodeContainer, 411
- Option
 - Arc::URL, 335
- Options
 - Arc::URL, 335
- OptionString
 - Arc::URL, 335
- OutputCertificate
 - Arc::Credential, 95
- OutputCertificateChain
 - Arc::Credential, 95
- OutputPrivateKey
 - Arc::Credential, 95
- OutputPublicKey
 - Arc::Credential, 95
- OverlayFile
 - Arc::UserConfig, 360
- Parent
 - Arc::XMLNode, 407
- parse
 - Arc::Config, 77
- parseDN
 - Arc::OAuthConsumer, 232
 - Arc::SAML2SSOHTTPClient, 279
- ParseOptions
 - Arc::URL, 335
- parsePolicy
 - ArcSec::PolicyParser, 263
- parseVOMSAC
 - Arc, 40, 41
- PARSING_ERROR
 - Arc, 36
- Passive
 - Arc::DataPoint, 113
 - Arc::DataPointDirect, 119
 - Arc::DataPointIndex, 125
- passphrase_callback
 - Arc, 41
- Passwd
 - Arc::URL, 336
- passwd, 234
 - Arc::URL, 337
- Password
 - Arc::UserConfig, 361
- PasswordType
 - Arc::UsernameToken, 368
- Path
 - Arc::URL, 336
 - Arc::XMLNode, 408
- path
 - Arc::URL, 337
- Path2BaseDN
 - Arc::URL, 336

- PathIterator
 - Arc::PathIterator, 234
- Payload
 - Arc::Message, 218
 - Arc::SOAPMessage, 293
- PayloadRaw
 - Arc::PayloadRaw, 236
- PayloadSOAP
 - Arc::PayloadSOAP, 241
- PayloadStream
 - Arc::PayloadStream, 242
- PayloadWSRF
 - Arc::PayloadWSRF, 247
- Period
 - Arc::Period, 249
- plainstr
 - Arc::URL, 336
- Plexer
 - Arc::Plexer, 254
- plugins_table_name
 - Arc, 42
- PluginsFactory
 - Arc::PluginsFactory, 259
- Policy
 - ArcSec::Policy, 261
- PolicyStore
 - ArcSec::PolicyStore, 263
- Port
 - Arc::URL, 336
- port
 - Arc::URL, 337
- Pos
 - Arc::PayloadStream, 243
 - Arc::PayloadStreamInterface, 246
- PossibleTargets
 - Arc::Broker, 63
- PostRegister
 - Arc::DataPoint, 113
 - Arc::DataPointDirect, 119
- PostRegisterError
 - Arc::DataStatus, 132
- PreFilterTargets
 - Arc::Broker, 62
- Prefix
 - Arc::XMLNode, 408
- PreRegister
 - Arc::DataPoint, 113
 - Arc::DataPointDirect, 120
- PreRegisterError
 - Arc::DataStatus, 132
- PreUnregister
 - Arc::DataPoint, 113
 - Arc::DataPointDirect, 120
- Print
 - Arc::ExecutionTarget, 155
 - Arc::Job, 185
 - Arc::JobDescription, 191
- print
 - Arc::Config, 77
- PrintJobStatus
 - Arc::JobController, 188
- PrintTargetInfo
 - Arc::TargetGenerator, 318
- process
 - Arc::ClientHTTPwithSAML2SSO, 70
 - Arc::ClientSOAP, 72
 - Arc::ClientSOAPwithSAML2SSO, 72
 - Arc::MCC, 209
 - Arc::MCCInterface, 213
 - Arc::Plexer, 254
 - Test::TestService, 323
- processConsent
 - Arc::HakaClient, 169
 - Arc::OpenIdpClient, 233
 - Arc::SAML2SSOHTTPClient, 279
- processIdP2Confusa
 - Arc::HakaClient, 169
 - Arc::OpenIdpClient, 233
 - Arc::SAML2SSOHTTPClient, 279
- processIdPLogin
 - Arc::HakaClient, 169
 - Arc::OpenIdpClient, 233
 - Arc::SAML2SSOHTTPClient, 279
- processLogin
 - Arc::OAuthConsumer, 232
 - Arc::SAML2LoginClient, 278
 - Arc::SAML2SSOHTTPClient, 279
- ProcessSecHandlers
 - Arc::MCC, 209
 - Arc::Service, 289
- Protocol
 - Arc::URL, 336
- protocol
 - Arc::URL, 338
- PROTOCOL_RECOGNIZED_ERROR
 - Arc, 36
- ProvidesMeta
 - Arc::DataPoint, 114
 - Arc::DataPointDirect, 120
 - Arc::DataPointIndex, 125
- ProxyPath
 - Arc::UserConfig, 361, 362
- pushCSR
 - Arc::OAuthConsumer, 232
 - Arc::SAML2SSOHTTPClient, 280
- Put
 - Arc::PayloadStream, 243
 - Arc::PayloadStreamInterface, 246

- Query
 - Arc::Query, 265
- Range
 - Arc::DataPoint, 114
 - Arc::DataPointDirect, 120
 - Arc::DataPointIndex, 125
- RC_DEFAULT_PORT
 - URL.h, 416
- ReadAcquireError
 - Arc::DataStatus, 132
- ReadError
 - Arc::DataStatus, 132
- ReadFromFile
 - Arc::XMLNode, 408
- ReadFromStream
 - Arc::XMLNode, 408
- ReadOutOfOrder
 - Arc::DataPoint, 114
 - Arc::DataPointDirect, 121
 - Arc::DataPointIndex, 125
- ReadResolveError
 - Arc::DataStatus, 132
- ReadStartError
 - Arc::DataStatus, 132
- ReadStderr
 - Arc::Run, 276
- ReadStdout
 - Arc::Run, 276
- ReadStopError
 - Arc::DataStatus, 132
- ReferenceParameter
 - Arc::WSAHeader, 375
- ReferenceParameters
 - Arc::WSAEndpointReference, 373
- Registered
 - Arc::DataPoint, 114
 - Arc::DataPointDirect, 121
 - Arc::DataPointIndex, 126
- RegisteredService
 - Arc::RegisteredService, 268
- registration
 - Arc::InfoRegistrar, 174
- RegistrationCollector
 - Arc::Service, 289
- RelatesTo
 - Arc::WSAHeader, 375, 376
- RelationshipType
 - Arc::WSAHeader, 376
- Release
 - Arc::FileCache, 162
- reload
 - Arc::ModuleManager, 226
- remove
 - Arc::MessageAttributes, 220
- removeAll
 - Arc::MessageAttributes, 220
- removeService
 - Arc::InfoRegisterContainer, 172
- Replace
 - Arc::XMLNode, 408
- ReplyTo
 - Arc::WSAHeader, 376
- report
 - Arc::PluginsFactory, 259
- Request
 - Arc::DelegationConsumer, 137
 - ArcSec::Request, 270
- RequestAttribute
 - ArcSec::RequestAttribute, 271
- RequestItem
 - ArcSec::RequestItem, 272
- reserve
 - Arc::Counter, 86
 - Arc::IntraProcessCounter, 183
- reset
 - Arc::SimpleCondition, 291
- Resolve
 - Arc::DataPoint, 114
 - Arc::DataPointDirect, 121
- Rest
 - Arc::PathIterator, 235
- Restore
 - Arc::DelegationConsumer, 137
- restricted_
 - Arc::DelegationContainerSOAP, 140
- Result
 - Arc::InformationResponse, 178
 - Arc::Run, 277
- Run
 - Arc::Run, 275
- Running
 - Arc::Run, 277
- Same
 - Arc::XMLNode, 408
- SAML2LoginClient
 - Arc::SAML2LoginClient, 278
- SAMLTOKEN
 - Arc::SAMLToken, 281, 282
- SAMLVersion
 - Arc::SAMLToken, 281
- save
 - Arc::Config, 77
- SaveJobStatusToStream
 - Arc::JobController, 188
- SaveTargetInfoToStream
 - Arc::TargetGenerator, 318

- SaveToFile
 - Arc::UserConfig, 362
 - Arc::XMLNode, 408
- SaveToStream
 - Arc::ExecutionTarget, 156
 - Arc::Job, 185
 - Arc::JobDescription, 191
 - Arc::XMLNode, 408
- scan
 - Arc::PluginsFactory, 260
- Scope
 - Arc::URL, 332
- sechandlers_
 - Arc::MCC, 210
 - Arc::Service, 290
- secure
 - Arc::DataMover, 107
- seekable_
 - Arc::PayloadStream, 244
- selectSoftware
 - Arc::SoftwareRequirement, 306, 307
- Service
 - Arc::Service, 289
- ServiceCounter
 - Arc::TargetGenerator, 318
- SESSION_CLOSE
 - Arc, 36
- Set
 - Arc::XMLNode, 408
- set
 - Arc::DataBuffer, 104
 - Arc::MessageAttributes, 221
- set_base
 - Arc::DataSpeed, 130
- set_default_max_inactivity_time
 - Arc::DataMover, 107
- set_default_min_average_speed
 - Arc::DataMover, 107
- set_default_min_speed
 - Arc::DataMover, 107
- set_max_data
 - Arc::DataSpeed, 130
- set_max_inactivity_time
 - Arc::DataSpeed, 130
- set_min_average_speed
 - Arc::DataSpeed, 130
- set_min_speed
 - Arc::DataSpeed, 130
- set_namespaces
 - Arc::WSRF, 378
 - Arc::WSRFBASEFault, 379
 - Arc::WSRP, 382
- set_progress_indicator
 - Arc::DataSpeed, 131
- SetAdditionalChecks
 - Arc::DataPoint, 115
 - Arc::DataPointDirect, 121
 - Arc::DataPointIndex, 126
- setAttributeFactory
 - ArcSec::Request, 271
- setBackups
 - Arc::LogFile, 198
- setCfg
 - Arc::ModuleManager, 226
- setCombiningAlg
 - ArcSec::Evaluator, 151
- setEvalResult
 - ArcSec::Policy, 262
- setEvaluatorContext
 - ArcSec::Policy, 262
- setExcess
 - Arc::Counter, 86
 - Arc::IntraProcessCounter, 183
- setFileName
 - Arc::Config, 77
- SetFormat
 - Arc::Time, 328
- setIdentifier
 - Arc::LogMessage, 204
- SetLifeTime
 - Arc::Credential, 95
- setLimit
 - Arc::Counter, 86
 - Arc::IntraProcessCounter, 183
- setMaxSize
 - Arc::LogFile, 198
- SetMeta
 - Arc::DataPoint, 115
 - Arc::DataPointIndex, 126
- SetPeriod
 - Arc::Period, 251
- SetProxyPolicy
 - Arc::Credential, 95
- setReopen
 - Arc::LogFile, 199
- setRequestItems
 - ArcSec::Request, 271
- setRequirement
 - Arc::SoftwareRequirement, 308
- SetSecure
 - Arc::DataPoint, 115
 - Arc::DataPointDirect, 121
 - Arc::DataPointIndex, 126
- SetStartTime
 - Arc::Credential, 96
- setThreadContext
 - Arc::Logger, 202
- setThreshold

- Arc::Logger, 202
- setThresholdForDomain
 - Arc::Logger, 202
- SetTime
 - Arc::Time, 328
- SetValid
 - Arc::FileCache, 162
- shutdown
 - Arc::Database, 99
 - Arc::MySQLDatabase, 228
- signal
 - Arc::SimpleCondition, 291
- signal_nonblock
 - Arc::SimpleCondition, 291
- SignEECRequest
 - Arc::Credential, 96
- SignNode
 - Arc::XMLSecNode, 413
- SignRequest
 - Arc::Credential, 96
- Size
 - Arc::PayloadRaw, 237
 - Arc::PayloadRawInterface, 240
 - Arc::PayloadStream, 243
 - Arc::PayloadStreamInterface, 246
 - Arc::XMLNode, 408
 - Arc::XMLNodeContainer, 411
- size
 - Arc::PayloadRawBuf, 238
- SLCS
 - Arc::UserConfig, 362, 363
- SOAP
 - Arc::InformationRequest, 177
 - Arc::WSRF, 378
- SOAPMessage
 - Arc::SOAPMessage, 293
- Software
 - Arc::Software, 295, 296
- SoftwareRequirement
 - Arc::SoftwareRequirement, 302
- SortLocations
 - Arc::DataPoint, 115
 - Arc::DataPointDirect, 122
 - Arc::DataPointIndex, 126
- SortTargets
 - Arc::Broker, 63
- Source
 - ArcSec::Source, 309
- STACK_OF
 - Arc::Credential, 96
- StageError
 - Arc::DataStatus, 133
- Start
 - Arc::FileCache, 162
- Arc::Run, 277
- StartReading
 - Arc::DataPoint, 115
 - Arc::DataPointIndex, 126
- StartWriting
 - Arc::DataPoint, 116
 - Arc::DataPointIndex, 127
- Stat
 - Arc::DataPoint, 116
- StatError
 - Arc::DataStatus, 133
- STATUS_OK
 - Arc, 36
- StatusKind
 - Arc, 36
- Stop
 - Arc::FileCache, 163
- StopAndDelete
 - Arc::FileCache, 163
- StopReading
 - Arc::DataPoint, 116
 - Arc::DataPointIndex, 127
- StopWriting
 - Arc::DataPoint, 116
 - Arc::DataPointIndex, 127
- storeCert
 - Arc::OAuthConsumer, 232
 - Arc::SAML2SSOHTTPClient, 280
- StoreDirectory
 - Arc::UserConfig, 363
- str
 - Arc::Time, 329
 - Arc::URL, 336
 - Arc::URLLocation, 339
- string
 - Arc, 41
- Submit
 - Arc::Submitter, 312
- SubmitterLoader
 - Arc::SubmitterLoader, 313
- Success
 - Arc::DataStatus, 132
- SuccessCached
 - Arc::DataStatus, 133
- Swap
 - Arc::XMLNode, 409
- SYSCONFIG
 - Arc::UserConfig, 367
- SYSCONFIGARCLOC
 - Arc::UserConfig, 368
- SystemError
 - Arc::DataStatus, 133
- TargetGenerator

- Arc::TargetGenerator, 315
- TargetRetriever
 - Arc::TargetRetriever, 319
- TargetRetrieverLoader
 - Arc::TargetRetrieverLoader, 321
- Test::TestMCC, 322
- Test::TestService, 323
 - process, 323
- thread_stacksize
 - Arc, 42
- ThreadDataItem
 - Arc::ThreadDataItem, 324
- Time
 - Arc::Time, 327
- Timeout
 - Arc::PayloadStream, 244
 - Arc::PayloadStreamInterface, 246
 - Arc::UserConfig, 363, 364
- TimeStamp
 - Arc, 42
- To
 - Arc::WSAHeader, 376
- toString
 - Arc::Software, 300
- ToXML
 - Arc::Job, 185
- Transfer
 - Arc::DataMover, 107
- transfer
 - Arc::DataSpeed, 131
- TransferError
 - Arc::DataStatus, 132
- Truncate
 - Arc::PayloadRaw, 237
 - Arc::PayloadRawInterface, 240
- TryLoad
 - Arc::PluginsFactory, 260
- UnimplementedError
 - Arc::DataStatus, 133
- UNKNOWN_SERVICE_ERROR
 - Arc, 36
- UnknownError
 - Arc::DataStatus, 133
- Unlink
 - Arc::MCC, 209
- unload
 - Arc::ModuleManager, 226
- unlock
 - Arc::SimpleCondition, 291
- Unregister
 - Arc::DataPoint, 117
 - Arc::DataPointDirect, 122
- UnregisterError
 - Arc::DataStatus, 132
- Update
 - Arc::ExecutionTarget, 156
- UpdateCredentials
 - Arc::DelegationConsumerSOAP, 139
 - Arc::DelegationContainerSOAP, 140
 - Arc::DelegationProviderSOAP, 143
- URL
 - Arc::URL, 332
- URL.h, 415
 - RC_DEFAULT_PORT, 416
- urlencode
 - Arc::ConfusaParserUtils, 79
- urlencode_params
 - Arc::ConfusaParserUtils, 79
- URLLocation
 - Arc::URLLocation, 339
- urloptions
 - Arc::URL, 338
- UserConfig
 - Arc::UserConfig, 343–345
- UserName
 - Arc::UserConfig, 364
- Username
 - Arc::URL, 336
 - Arc::UsernameToken, 370
- username
 - Arc::URL, 338
- UsernameToken
 - Arc::UsernameToken, 369
- UtilsDirPath
 - Arc::UserConfig, 365
- valid
 - Arc::URL, 338
- valid_
 - Arc::WSRF, 378
- valid_url_options
 - Arc::DataPoint, 117
- Validate
 - Arc::XMLNode, 409
- verbose
 - Arc::DataMover, 108
 - Arc::DataSpeed, 131
- Verbosity
 - Arc::UserConfig, 365, 366
- VerifyNode
 - Arc::XMLSecNode, 413
- VERSIONTOKENS
 - Arc::Software, 301
- VOMSDDecode
 - Arc, 42
- VOMSServerPath
 - Arc::UserConfig, 366

- VOMSTrustList
 - Arc::VOMSTrustList, 371
- Wait
 - Arc::Run, 277
- wait
 - Arc::SimpleCondition, 291
 - Arc::SimpleCounter, 292
- wait_any
 - Arc::DataBuffer, 105
- wait_nonblock
 - Arc::SimpleCondition, 291
- WaitForExit
 - Arc::ThreadRegistry, 325
- WaitOrCancel
 - Arc::ThreadRegistry, 325
- WriteAcquireError
 - Arc::DataStatus, 132
- WriteError
 - Arc::DataStatus, 132
- WriteOutOfOrder
 - Arc::DataPoint, 117
 - Arc::DataPointDirect, 122
 - Arc::DataPointIndex, 127
- WriteResolveError
 - Arc::DataStatus, 132
- WriteStartError
 - Arc::DataStatus, 132
- WriteStdin
 - Arc::Run, 277
- WriteStopError
 - Arc::DataStatus, 132
- WSAEndpointReference
 - Arc::WSAEndpointReference, 372
- WSAFault
 - Arc, 36
- WSAFaultAssign
 - Arc, 42
- WSAFaultExtract
 - Arc, 42
- WSAFaultInvalidAddressingHeader
 - Arc, 36
- WSAFaultUnknown
 - Arc, 36
- WSAHeader
 - Arc::WSAHeader, 374
- WSRF
 - Arc::WSRF, 377
- WSRFBBaseFault
 - Arc::WSRFBBaseFault, 379
- WSRP
 - Arc::WSRP, 381
- WSRPFault
 - Arc::WSRPFault, 384
- WSRPResourcePropertyChangeFailure
 - Arc::WSRPResourcePropertyChangeFailure, 392
- X509Token
 - Arc::X509Token, 397
- X509TokenType
 - Arc::X509Token, 397
- XMLNode
 - Arc::XMLNode, 401, 402
- XMLNodeContainer
 - Arc::XMLNodeContainer, 411
- XMLSecNode
 - Arc::XMLSecNode, 412
- XPathLookup
 - Arc::XMLNode, 409