

VOMS CC API

1.5.0

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Contents

1	Data Structure Index	1
1.1	Data Structures	1
2	File Index	3
2.1	File List	3
3	Data Structure Documentation	5
3.1	attribute Struct Reference	5
3.1.1	Field Documentation	5
3.1.1.1	name	5
3.1.1.2	qualifier	5
3.1.1.3	value	5
3.2	attributelist Struct Reference	6
3.2.1	Field Documentation	6
3.2.1.1	attributes	6
3.2.1.2	grantor	6
3.3	contactdata Struct Reference	6
3.3.1	Field Documentation	7
3.3.1.1	contact	7
3.3.1.2	host	7
3.3.1.3	nick	7
3.3.1.4	port	7
3.3.1.5	version	7
3.3.1.6	vo	7
3.4	data Struct Reference	7
3.4.1	Detailed Description	8

3.4.2	Field Documentation	8
3.4.2.1	cap	8
3.4.2.2	group	8
3.4.2.3	role	8
3.5	vomsdata::Initializer Class Reference	8
3.5.1	Constructor & Destructor Documentation	9
3.5.1.1	Initializer	9
3.6	voms Struct Reference	9
3.6.1	Constructor & Destructor Documentation	10
3.6.1.1	voms	10
3.6.1.2	voms	10
3.6.1.3	~voms	10
3.6.2	Member Function Documentation	10
3.6.2.1	GetAC	10
3.6.2.2	GetAttributes	10
3.6.2.3	GetTargets	10
3.6.2.4	operator=	10
3.6.3	Friends And Related Function Documentation	10
3.6.3.1	TranslateVOMS	10
3.6.3.2	vomsdata	10
3.6.4	Field Documentation	10
3.6.4.1	custom	10
3.6.4.2	date1	10
3.6.4.3	date2	10
3.6.4.4	fqn	11
3.6.4.5	serial	11
3.6.4.6	server	11
3.6.4.7	serverca	11
3.6.4.8	siglen	11
3.6.4.9	signature	11
3.6.4.10	std	11
3.6.4.11	type	11
3.6.4.12	uri	12
3.6.4.13	user	12

3.6.4.14	userca	12
3.6.4.15	version	12
3.6.4.16	voname	12
3.7	vomsdata Struct Reference	12
3.7.1	Constructor & Destructor Documentation	14
3.7.1.1	vomsdata	14
3.7.1.2	~vomsdata	14
3.7.1.3	vomsdata	14
3.7.2	Member Function Documentation	14
3.7.2.1	AddTarget	14
3.7.2.2	Contact	14
3.7.2.3	Contact	15
3.7.2.4	ContactRaw	15
3.7.2.5	ContactRaw	15
3.7.2.6	ContactRESTRaw	16
3.7.2.7	DefaultData	16
3.7.2.8	ErrorMessage	16
3.7.2.9	Export	16
3.7.2.10	FindByAlias	16
3.7.2.11	FindByVO	17
3.7.2.12	Import	17
3.7.2.13	ListTargets	17
3.7.2.14	LoadCredentials	17
3.7.2.15	LoadSystemContacts	17
3.7.2.16	LoadUserContacts	18
3.7.2.17	Order	18
3.7.2.18	ResetOrder	18
3.7.2.19	ResetTargets	18
3.7.2.20	Retrieve	19
3.7.2.21	Retrieve	19
3.7.2.22	Retrieve	19
3.7.2.23	Retrieve	19
3.7.2.24	RetrieveFromCred	20
3.7.2.25	RetrieveFromCtx	20

3.7.2.26	RetrieveFromProxy	20
3.7.2.27	ServerErrors	21
3.7.2.28	SetLifetime	21
3.7.2.29	SetRetryCount	21
3.7.2.30	SetVerificationTime	21
3.7.2.31	SetVerificationType	21
3.7.3	Field Documentation	21
3.7.3.1	data	21
3.7.3.2	error	21
3.7.3.3	extra_data	21
3.7.3.4	workvo	22
4	File Documentation	23
4.1	voms_api.h File Reference	23
4.1.1	Define Documentation	24
4.1.1.1	NOGLOBUS	24
4.1.2	Typedef Documentation	24
4.1.2.1	check_sig	24
4.1.2.2	gss_cred_id_t	24
4.1.2.3	gss_ctx_id_t	24
4.1.3	Enumeration Type Documentation	25
4.1.3.1	data_type	25
4.1.3.2	recurse_type	25
4.1.3.3	verify_type	25
4.1.3.4	verror_type	25
4.1.4	Function Documentation	26
4.1.4.1	getVOMSMajorVersionNumber	26
4.1.4.2	getVOMSMinorVersionNumber	26
4.1.4.3	getVOMSPatchVersionNumber	26

Chapter 1

Data Structure Index

1.1 Data Structures

Here are the data structures with brief descriptions:

attribute	5
attributelist	6
contactdata	6
data	
User's characteristics: can be repeated. Generic name-value at-	
tribute : can be repeated	7
vomsdata::Initializer	8
voms	9
vomsdata	12

Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

voms_api.h	23
----------------------------	----

Chapter 3

Data Structure Documentation

3.1 attribute Struct Reference

```
#include <voms_api.h>
```

Data Fields

- std::string [name](#)
- std::string [qualifier](#)
- std::string [value](#)

3.1.1 Field Documentation

3.1.1.1 std::string attribute::name

attribute's group

Definition at line 64 of file voms_api.h.

3.1.1.2 std::string attribute::qualifier

attribute's qualifier

Definition at line 65 of file voms_api.h.

3.1.1.3 std::string attribute::value

attribute's value

Definition at line 66 of file voms_api.h.

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

- [voms_api.h](#)

3.2 attributelist Struct Reference

```
#include <voms_api.h>
```

Data Fields

- std::string [grantor](#)
- std::vector< [attribute](#) > [attributes](#)

3.2.1 Field Documentation

3.2.1.1 std::vector<attribute> attributelist::attributes

The attributes themselves.

Definition at line 71 of file voms_api.h.

3.2.1.2 std::string attributelist::grantor

Who granted these attributes.

Definition at line 70 of file voms_api.h.

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

- [voms_api.h](#)

3.3 contactdata Struct Reference

```
#include <voms_api.h>
```

Data Fields

- std::string [nick](#)
- std::string [host](#)
- std::string [contact](#)
- std::string [vo](#)
- int [port](#)
- int [version](#)

3.3.1 Field Documentation

3.3.1.1 `std::string contactdata::contact`

The subject of the server's certificate

Definition at line 89 of file voms_api.h.

3.3.1.2 `std::string contactdata::host`

The hostname of the server

Definition at line 88 of file voms_api.h.

3.3.1.3 `std::string contactdata::nick`

< You must never allocate directly this structure. Its `sizeof()` is subject to change without notice. The only supported way to obtain it is via the `FindBy*` functions. The alias of the server

Definition at line 87 of file voms_api.h.

3.3.1.4 `int contactdata::port`

The port on which the server is listening

Definition at line 91 of file voms_api.h.

3.3.1.5 `int contactdata::version`

The version of globus under which the server is running

Definition at line 93 of file voms_api.h.

3.3.1.6 `std::string contactdata::vo`

The VO served by this server

Definition at line 90 of file voms_api.h.

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

- [voms_api.h](#)

3.4 data Struct Reference

User's characteristics: can be repeated. Generic name-value attribute : can be repeated.

```
#include <voms_api.h>
```

Data Fields

- `std::string` [group](#)
- `std::string` [role](#)
- `std::string` [cap](#)

3.4.1 Detailed Description

User's characteristics: can be repeated. Generic name-value attribute : can be repeated.

3.4.2 Field Documentation

3.4.2.1 `std::string data::cap`

user's capability

Definition at line 58 of file `voms_api.h`.

3.4.2.2 `std::string data::group`

user's group

Definition at line 56 of file `voms_api.h`.

3.4.2.3 `std::string data::role`

user's role

Definition at line 57 of file `voms_api.h`.

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

- [voms_api.h](#)

3.5 vomsdata::Initializer Class Reference

Public Member Functions

- [Initializer](#) ()

3.5.1 Constructor & Destructor Documentation

3.5.1.1 vomsdata::Initializer::Initializer ()

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

- [voms_api.h](#)

3.6 voms Struct Reference

```
#include <voms_api.h>
```

Public Member Functions

- [voms](#) (const [voms](#) &)
- [voms](#) ()
- [voms](#) & [operator=](#) (const [voms](#) &)
- [~voms](#) ()
- AC * [GetAC](#) ()
- std::vector< [attributelist](#) > & [GetAttributes](#) ()
- std::vector< std::string > [GetTargets](#) ()

Data Fields

- int [version](#)
- int [siglen](#)
- std::string [signature](#)
- std::string [user](#)
- std::string [userca](#)
- std::string [server](#)
- std::string [serverca](#)
- std::string [voname](#)
- std::string [uri](#)
- std::string [date1](#)
- std::string [date2](#)
- [data_type](#) type
- std::vector< [data](#) > [std](#)
- std::string [custom](#)
- std::vector< std::string > [fqan](#)
- std::string [serial](#)

Friends

- class [vomsdata](#)
- int [TranslateVOMS](#) (struct vomsdatar *vd, std::vector< [voms](#) > &v, int *error)

3.6.1 Constructor & Destructor Documentation

3.6.1.1 `voms::voms (const voms &)`

3.6.1.2 `voms::voms ()`

3.6.1.3 `voms::~~voms ()`

3.6.2 Member Function Documentation

3.6.2.1 `AC* voms::GetAC ()`

3.6.2.2 `std::vector<attributelist>& voms::GetAttributes ()`

Generic attributes

3.6.2.3 `std::vector<std::string> voms::GetTargets ()`

3.6.2.4 `voms& voms::operator= (const voms &)`

3.6.3 Friends And Related Function Documentation

3.6.3.1 `int TranslateVOMS (struct vomsdata * vd, std::vector< voms > & v, int * error)`
[friend]

3.6.3.2 `friend class vomsdata` [friend]

Definition at line 99 of file voms_api.h.

3.6.4 Field Documentation

3.6.4.1 `std::string voms::custom`

The data returned by an S command

Definition at line 113 of file voms_api.h.

3.6.4.2 `std::string voms::date1`

Beginning of validity of the user info

Definition at line 109 of file voms_api.h.

3.6.4.3 `std::string voms::date2`

End of validity of the user info

Definition at line 110 of file voms_api.h.

3.6.4.4 `std::vector<std::string> voms::fqan`

Keeps the data in the compact format

Definition at line 115 of file voms_api.h.

3.6.4.5 `std::string voms::serial`

Serial number. "0" if coming from non-ac

Definition at line 116 of file voms_api.h.

3.6.4.6 `std::string voms::server`

The VOMS server DN, as from its certificate

Definition at line 105 of file voms_api.h.

3.6.4.7 `std::string voms::serverca`

The CA which signed the VOMS certificate

Definition at line 106 of file voms_api.h.

3.6.4.8 `int voms::siglen`

The length of the VOMS server signature

Definition at line 101 of file voms_api.h.

3.6.4.9 `std::string voms::signature`

The VOMS server signature

Definition at line 102 of file voms_api.h.

3.6.4.10 `std::vector<data> voms::std`

User's characteristics

Definition at line 112 of file voms_api.h.

3.6.4.11 `data_type voms::type`

The type of data returned

Definition at line 111 of file voms_api.h.

3.6.4.12 `std::string voms::uri`

The URI of the VOMS server

Definition at line 108 of file voms_api.h.

3.6.4.13 `std::string voms::user`

The user's DN, as from his certificate

Definition at line 103 of file voms_api.h.

3.6.4.14 `std::string voms::userca`

The CA which signed the user's certificate

Definition at line 104 of file voms_api.h.

3.6.4.15 `int voms::version`

0 means data didn't originate from an AC

Definition at line 100 of file voms_api.h.

3.6.4.16 `std::string voms::vname`

The name of the VO to which the VOMS belongs

Definition at line 107 of file voms_api.h.

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

- [voms_api.h](#)

3.7 vomsdata Struct Reference

```
#include <voms_api.h>
```

Data Structures

- class [Initializer](#)

Public Member Functions

- [vomsdata](#) (std::string voms_dir="", std::string cert_dir="")
- bool [LoadSystemContacts](#) (std::string dir="")
- bool [LoadUserContacts](#) (std::string dir="")
- std::vector< [contactdata](#) > [FindByAlias](#) (std::string alias)
- std::vector< [contactdata](#) > [FindByVO](#) (std::string vo)
- void [Order](#) (std::string att)
- void [ResetOrder](#) (void)
- void [AddTarget](#) (std::string target)
- std::vector< std::string > [ListTargets](#) (void)
- void [ResetTargets](#) (void)
- std::string [ServerErrors](#) (void)
- bool [Retrieve](#) (X509 *cert, STACK_OF(X509)*chain, [recurse_type](#) how=RECURSE_CHAIN)
- bool [Contact](#) (std::string hostname, int port, std::string servsubject, std::string command)
- bool [Contact](#) (std::string hostname, int port, std::string servsubject, std::string command, int timeout)
- bool [ContactRaw](#) (std::string hostname, int port, std::string servsubject, std::string command, std::string &raw, int &version)
- bool [ContactRaw](#) (std::string hostname, int port, std::string servsubject, std::string command, std::string &raw, int &version, int timeout)
- void [SetVerificationType](#) ([verify_type](#) how)
- void [SetLifetime](#) (int lifetime)
- bool [Import](#) (std::string buffer)
- bool [Export](#) (std::string &data)
- bool [DefaultData](#) (voms &)
- std::string [ErrorMessage](#) (void)
- bool [RetrieveFromCtx](#) (gss_ctx_id_t context, [recurse_type](#) how)
- bool [RetrieveFromCred](#) (gss_cred_id_t credential, [recurse_type](#) how)
- bool [Retrieve](#) (X509_EXTENSION *ext)
- bool [RetrieveFromProxy](#) ([recurse_type](#) how)
- bool [Retrieve](#) (FILE *file, [recurse_type](#) how)
- bool [Retrieve](#) (AC *ac)
- ~[vomsdata](#) ()
- [vomsdata](#) (const [vomsdata](#) &)
- void [SetRetryCount](#) (int retryCount)
- void [SetVerificationTime](#) (time_t)
- bool [LoadCredentials](#) (X509 *, EVP_PKEY *, STACK_OF(X509)*)
- bool [ContactRESTRaw](#) (const std::string &, int, const std::string &, std::string &, int, int)

Data Fields

- [verror_type](#) error
- std::vector< [voms](#) > [data](#)
- std::string [workvo](#)
- std::string [extra_data](#)

3.7.1 Constructor & Destructor Documentation

3.7.1.1 `vomsdata::vomsdata (std::string voms_dir = " ", std::string cert_dir = " ")`

Parameters

<i>voms_dir</i>	The directory which contains the certificate of the VOMS server
<i>cert_dir</i>	The directory which contains the certificate of the CA

If *voms_dir* is empty, the value of the environment variable X509_VOMS_DIR is taken.

If *cert_dir* is empty, the value of the environment variable X509_CERT_DIR is taken.

3.7.1.2 `vomsdata::~vomsdata ()`

3.7.1.3 `vomsdata::vomsdata (const vomsdata &)`

3.7.2 Member Function Documentation

3.7.2.1 `void vomsdata::AddTarget (std::string target)`

Adds a target to the AC.

Parameters

<i>target</i>	The target to be added. it should be a FQDN.
---------------	--

3.7.2.2 `bool vomsdata::Contact (std::string hostname, int port, std::string servsubject, std::string command)`

Contacts a VOMS server to get a certificate

It is the equivalent of the `voms_proxy_init` command, but without the `--include functionality`.

Parameters

<i>hostname</i>	FQDN of the VOMS server
<i>port</i>	the port on which the VOMS server is listening
<i>servsubject</i>	the subject of the server's certificate
<i>command</i>	the command sent to the server

Returns

failure (F) or success (T)

3.7.2.3 `bool vomsdata::Contact (std::string hostname, int port, std::string servsubject,
std::string command, int timeout)`

Contacts a VOMS server to get a certificate

It is the equivalent of the `voms_proxy_init` command, but without the `--include` functionality.

Parameters

<i>hostname</i>	FQDN of the VOMS server
<i>port</i>	the port on which the VOMS server is listening
<i>servsubject</i>	the subject of the server's certificate
<i>command</i>	the command sent to the server

Returns

failure (F) or success (T)

3.7.2.4 `bool vomsdata::ContactRaw (std::string hostname, int port, std::string servsubject,
std::string command, std::string & raw, int & version)`

Same as `Contact`, however it does not start the verification process, and the message received from the server is not parsed.

Parameters

<i>hostname</i>	FQDN of the VOMS server
<i>port</i>	the port on which the VOMS server is listening
<i>servsubject</i>	the subject of the server's certificate
<i>command</i>	the command sent to the server
<i>raw</i>	OUTPUT PARAMETER the answer from the server
<i>version</i>	OUTPUT PARAMETER the version of the answer

Returns

failure (F) or success (T)

3.7.2.5 `bool vomsdata::ContactRaw (std::string hostname, int port, std::string servsubject,
std::string command, std::string & raw, int & version, int timeout)`

Same as `Contact`, however it does not start the verification process, and the message received from the server is not parsed.

Parameters

<i>hostname</i>	FQDN of the VOMS server
<i>port</i>	the port on which the VOMS server is listening
<i>servsubject</i>	the subject of the server's certificate
<i>command</i>	the command sent to the server
<i>raw</i>	OUTPUT PARAMETER the answer from the server
<i>version</i>	OUTPUT PARAMETER the version of the answer

Returns

failure (F) or success (T)

3.7.2.6 `bool vomsdata::ContactRESTRaw (const std::string & , int , const std::string & , std::string & , int , int)`

3.7.2.7 `bool vomsdata::DefaultData (voms &)`

Get the default data extension from those present in the pseudo certificate

3.7.2.8 `std::string vomsdata::ErrorMessage (void)`

Gets a textual description of the error.

Returns

A string containing the error message.

3.7.2.9 `bool vomsdata::Export (std::string & data)`

Exports data from [vomsdata::data](#) to the format used for inclusion into a certificate.

The function doesn't verify the data

Parameters

<i>data</i>	The certificate extension
-------------	---------------------------

Returns

Failure (F) or Success (T)

3.7.2.10 `std::vector<contactdata> vomsdata::FindByAlias (std::string alias)`

Finds servers which share a common alias.

Parameters

<i>alias</i>	The alias to look for.
--------------	------------------------

Returns

The servers found. The order in which they are returned is unspecified.

3.7.2.11 `std::vector<contactdata> vomsdata::FindByVO (std::string vo)`

Finds servers which serve a common VO

Parameters

<i>vo</i>	The VO name to look for.
-----------	--------------------------

Returns

The servers found. The order in which they are returned is unspecified.

3.7.2.12 `bool vomsdata::Import (std::string buffer)`

Converts data from the format used for inclusion into a certificate to the internal format
The function does verify the data.

Parameters

<i>buffer</i>	contains the data to be converted
---------------	-----------------------------------

Returns

Failure (F) or Success (T)

3.7.2.13 `std::vector<std::string> vomsdata::ListTargets (void)`

Returns the list of targets.

3.7.2.14 `bool vomsdata::LoadCredentials (X509 *, EVP_PKEY *, STACK_OF(X509)*)`**3.7.2.15** `bool vomsdata::LoadSystemContacts (std::string dir = " ")`

Loads the system wide configuration files.

Parameters

<i>dir</i>	The directory in which the files are stored.
------------	--

If *dir* is empty, defaults to `/opt/edg/etc/vomses`.

Returns

True if all went OK, false otherwise.

3.7.2.16 bool vomsdata::LoadUserContacts (std::string *dir* = " ")

Loads the user-specific configuration files.

Parameters

<i>dir</i>	The directory in which the files are stored.
------------	--

If *dir* is empty, defaults to `$VOMS_USERCONF`. If this is empty too, defaults to `$HOME/.edg/vomses`, or to `~/.edg/vomses` as a last resort.

Returns

True if all went OK, false otherwise.

3.7.2.17 void vomsdata::Order (std::string *att*)

Sets up the ordering of the results.

Defines the ordering of the data returned by [Contact\(\)](#). Results are ordered in the same order as the calls to this function.

Parameters

<i>att</i>	The attribute to be ordered.
------------	------------------------------

3.7.2.18 void vomsdata::ResetOrder (void)

Resets the ordering.

3.7.2.19 void vomsdata::ResetTargets (void)

Resets the target list.

3.7.2.20 `bool vomsdata::Retrieve (X509 * cert, STACK_OF(X509)* chain, recurse_type how = RECURSE_CHAIN)`

Extracts the VOMS extension from an X.509 certificate. The function doesn't check the validity of the certificates, but it does check the content of the user data.

Parameters

<i>cert</i>	The certificate with the VOMS extensions
<i>chain</i>	The chain of the validation certificates (only the intermediate ones)
<i>how</i>	Recursion type

Returns

failure (F) or success (T)

3.7.2.21 `bool vomsdata::Retrieve (X509_EXTENSION * ext)`

Gets VOMS information from the given extension

Parameters

<i>ext</i>	The extension to parse.
------------	-------------------------

Returns

failure (F) or success (T)

3.7.2.22 `bool vomsdata::Retrieve (FILE * file, recurse_type how)`

Gets VOMS information from a proxy saved as a file.

Parameters

<i>file</i>	the file name
<i>how</i>	Recursion type

Returns

failure (F) or success (T)

Note: Does NOT verify that the proxy is valid. Such verification must be obtained through other means.

3.7.2.23 `bool vomsdata::Retrieve (AC * ac)`

Gets VOMS information from the AC

Parameters

<i>ext</i>	The extension to parse.
------------	-------------------------

Returns

failure (F) or success (T)

3.7.2.24 `bool vomldata::RetrieveFromCred (gss_cred_id_t credential, recurse_type how)`

Gets VOMS information from the given globus credential

Parameters

<i>credential</i>	The credential from which to retrieve the certificate.
<i>how</i>	Recursion type

Returns

failure (F) or success (T)

3.7.2.25 `bool vomldata::RetrieveFromCtx (gss_ctx_id_t context, recurse_type how)`

Gets VOMS information from the given globus context

Parameters

<i>context</i>	The context from which to retrieve the certificate.
<i>how</i>	Recursion type

Returns

failure (F) or success (T)

3.7.2.26 `bool vomldata::RetrieveFromProxy (recurse_type how)`

Gets VOMS information from an existing globus proxy

Parameters

<i>how</i>	Recursion type
------------	----------------

Returns

failure (F) or success (T)

3.7.2.27 `std::string vomsdata::ServerErrors (void)`

Gets the error message returned by the server

3.7.2.28 `void vomsdata::SetLifetime (int lifetime)`

Set requested lifetime for the [Contact\(\)](#) call.

Parameters

<i>lifetime</i>	Requested lifetime, in seconds
-----------------	--------------------------------

3.7.2.29 `void vomsdata::SetRetryCount (int retryCount)`

3.7.2.30 `void vomsdata::SetVerificationTime (time_t)`

3.7.2.31 `void vomsdata::SetVerificationType (verify_type how)`

Sets the type of verification done on the data.

Parameters

<i>how</i>	The type of verification.
------------	---------------------------

3.7.3 Field Documentation

3.7.3.1 `std::vector<voms> vomsdata::data`

User's info, as in the certificate extension. It may contain data gathered from more than one VOMS server,

Definition at line 368 of file voms_api.h.

3.7.3.2 `verror_type vomsdata::error`

Error code

Definition at line 213 of file voms_api.h.

3.7.3.3 `std::string vomsdata::extra_data`

The data specified by the user with the --include switch.

Note that this field doesn't contain the result of a request to the VOMS server, but instead data specified by the user.

The reason for the introduction of this extension is to let a user include important data into his proxy certificate, like, for example, a kerberos ticket

Definition at line 372 of file voms_api.h.

3.7.3.4 `std::string vomsdata::workvo`

The value of the -vo option of the voms-proxy-init command

Definition at line 371 of file voms_api.h.

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

- [voms_api.h](#)

Chapter 4

File Documentation

4.1 voms_api.h File Reference

```
#include <fstream>  #include <string>  #include <vector>
#include <openssl/x509.h>      #include <openssl/bio.h> ×
#include <sys/types.h> #include "newformat.h"
```

Data Structures

- struct [data](#)
User's characteristics: can be repeated. Generic name-value attribute : can be repeated.
- struct [attribute](#)
- struct [attributelist](#)
- struct [contactdata](#)
- struct [voms](#)
- struct [vomsdata](#)
- class [vomsdata::Initializer](#)

Defines

- #define [NOGLOBUS](#)

Typedefs

- typedef void * [gss_cred_id_t](#)
- typedef void * [gss_ctx_id_t](#)
- typedef bool(* [check_sig](#))(X509 *, void *, [verror_type](#) &)

Enumerations

- enum `data_type` { `TYPE_NODATA`, `TYPE_STD`, `TYPE_CUSTOM` }
The type of data returned.
- enum `recurse_type` { `RECURSE_CHAIN`, `RECURSE_NONE`, `RECURSE_DEEP` }
- enum `verify_type` { `VERIFY_FULL` = 0xffffffff, `VERIFY_NONE` = 0x00000000, `VERIFY_DATE` = 0x00000001, `VERIFY_TARGET` = 0x00000002, `VERIFY_KEY` = 0x00000004, `VERIFY_SIGN` = 0x00000008, `VERIFY_ORDER` = 0x00000010, `VERIFY_ID` = 0x00000020, `VERIFY_CERTLIST` = 0x00000040 }
- enum `verror_type` { `VERR_NONE`, `VERR_NOCKET`, `VERR_NOIDENT`, `VERR_COMM`, `VERR_PARAM`, `VERR_NOEXT`, `VERR_NOINIT`, `VERR_TIME`, `VERR_IDCHECK`, `VERR_EXTRINFO`, `VERR_FORMAT`, `VERR_NODATA`, `VERR_PARSE`, `VERR_DIR`, `VERR_SIGN`, `VERR_SERVER`, `VERR_MEM`, `VERR_VERIFY`, `VERR_TYPE`, `VERR_ORDER`, `VERR_SERVERCODE`, `VERR_NOTAVAIL`, `VERR_FILE` }

Error codes.

Functions

- int `getVOMSMajorVersionNumber` (void)
- int `getVOMSMinorVersionNumber` (void)
- int `getVOMSPatchVersionNumber` (void)

4.1.1 Define Documentation

4.1.1.1 #define NOGLOBUS

Definition at line 33 of file `voms_api.h`.

4.1.2 Typedef Documentation

4.1.2.1 typedef bool(* check_sig)(X509 *, void *, verror_type &)

Definition at line 190 of file `voms_api.h`.

4.1.2.2 typedef void* gss_cred_id_t

Definition at line 42 of file `voms_api.h`.

4.1.2.3 typedef void* gss_ctx_id_t

Definition at line 43 of file `voms_api.h`.

4.1.3 Enumeration Type Documentation

4.1.3.1 enum data_type

The type of data returned.

Enumerator:

TYPE_NODATA no data
TYPE_STD group, role, capability triplet
TYPE_CUSTOM result of an S command

Definition at line 77 of file voms_api.h.

4.1.3.2 enum recurse_type

Enumerator:

RECURSE_CHAIN
RECURSE_NONE
RECURSE_DEEP

Definition at line 143 of file voms_api.h.

4.1.3.3 enum verify_type

Enumerator:

VERIFY_FULL
VERIFY_NONE
VERIFY_DATE
VERIFY_TARGET
VERIFY_KEY
VERIFY_SIGN
VERIFY_ORDER
VERIFY_ID
VERIFY_CERTLIST

Definition at line 149 of file voms_api.h.

4.1.3.4 enum verror_type

Error codes.

Enumerator:

VERR_NONE
VERR_NOSOCKET Socket problem
VERR_NOIDENT Cannot identify itself (certificate problem)
VERR_COMM Server problem
VERR_PARAM Wrong parameters
VERR_NOEXT VOMS extension missing
VERR_NOINIT Initialization error
VERR_TIME Error in time checking
VERR_IDCHECK User data in extension different from the real ones
VERR_EXTRAINFO VO name and URI missing
VERR_FORMAT Wrong data format
VERR_NODATA Empty extension
VERR_PARSE Parse error
VERR_DIR Directory error
VERR_SIGN Signature error
VERR_SERVER Unidentifiable VOMS server
VERR_MEM Memory problems
VERR_VERIFY Generic verification error
VERR_TYPE Returned data of unknown type
VERR_ORDER Ordering different than required
VERR_SERVERCODE Error message from the server
VERR_NOTAVAIL Method not available
VERR_FILE Error reading data from file

Definition at line 163 of file voms_api.h.

4.1.4 Function Documentation

- 4.1.4.1 int getVOMSMajorVersionNumber (void)
- 4.1.4.2 int getVOMSMinorVersionNumber (void)
- 4.1.4.3 int getVOMSPatchVersionNumber (void)