globus gsi callback Reference Manual

1.10

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1 Globus GSI Callback

The Globus GSI Callback library. This library contains functions that extend OpenSSL path validation.

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Here is a list of all related documentation pages:

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4.1 Activation

Globus GSI Callback uses standard Globus module activation and deactivation.

De nes

#de ne GLOBUS_GSI_CALLBACK_MODULE

4.1.1 Detailed Description

Globus GSI Callback uses standard Globus module activation and deactivation.

Before any Globus GSI Callback functions are called, the following function must be called:

```
globus_module_activate(GLOBUS_GSI_CALLBACK_MODULE)
```

This function returns GLOBUS_SUCCESS if Globus GSI Callback was successfully initialized, and you are therefore allowed to subsequently call Globus GSI Callback functions. Otherwise, an error code is returned, and Globus GSI Credential functions should not be subsequently called. This function may be called multiple times.

To deactivate Globus GSI Callback, the following function must be called:

```
globus_module_deactivate(GLOBUS_GSI_CALLBACK_MODULE)
```

This function should be called once for each time Globus GSI Callback was activated.

4.1.2 De ne Documentation

4.1.2.1 #de ne GLOBUS_GSI_CALLBACK_MODULE

Module descriptor.

4.2 Callback Functions

Functions that plug into various plug points in the OpenSSL path validation mechanism.

Get callback data index from X509_STORE

globus_result_t globus_gsi_callback_get_X509_STORE_callback_data_index(int index)

Get callback data index from SSL structure

globus_result_t globus_gsi_callback_get_SSL_callback_data_index(int index)

Certi cate verify wrapper

int globus_gsi_callback_X509_verify_cert(X509_STORE_CTX context, void arg)

Independent path validation callback.

int globus_gsi_callback_createproxy_callback(int preverify_ok, X509_STORE_CTX x509_context)

SSL path validation callback.

int globus_gsi_callback_handshake_callback(int preverify_ok, X509_STORE_CTX x509_context)

OpenSSL X509_check_issued() wrapper

int globus_gsi_callback_check_issued(X509_STORE_CTX context, X509 cert, X509 issuer)

Typedefs

typedef int(globus_gsi_extension_callback_t)(globus_gsi_callback_data_t callback_data, X509_EXTENSION extension)

4.2.1 Detailed Description

Functions that plug into various plug points in the OpenSSL path validation mechanism.

These functions add CRL checking, X509 Extension handling and proxy validation.

4.2.2 Typedef Documentation

4.2.2.1 typedef int(globus_gsi_extension_callback_t)(globus_gsi_callback_data_t callback_data, X509_EXTENSION extension)

Typedef for a callback that may be registered for dealing with unhandled X.509 extension.

4.2.3 Function Documentation

4.2.3.1 globus_result_t globus_gsi_callback_get_X509_STORE_callback_data_index (int index)

Retrieve or create the index for our callback data structure in the X509_STORE.

Parameters:
index Will contain the index upon return

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.2.3.2 globus_result_t globus_gsi_callback_get_SSL_callback_data_index (int index)

Retrieve or create the index for our callback data structure in the SSL structure.

Parameters:
index Will contain the index upon return

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.2.3.3 int globusgsi_callback_X509_verify_cert (X509_STORE_CTX * context, void * arg)

This function wraps the OpenSSL certificate verification callback for the purpose of a replacing the standard issuer check with one that deals with proxy certificates. Should be used with SSL_CTX_set_cert_verify_callback()

Parameters:

context The X509_STORE_CTX for which to register the callback.

arg Arguments to the callback. Currently ignored.

Returns:

1 on success 0 on failure

4.2.3.4 int globusgsi_callback_create_proxy_callback (int preverify_ok, X509_STORE_CTX * x509_context)

This function provides a path validation callback for validation outside of a SSL session. It should be used in X509_STORE_set_verify_cb_func().

Parameters:

preverify_ok Communicates the result of default validation steps performed by OpenSSL

x509_context The validation state object

Returns:

1 on success 0 on failure

4.2.3.5 int globusgsi_callback_handshake_callback (int preverify_ok, X509_STORE_CTX * x509_context)

This function provides a path validation callback for the validation part of establishing a SSL session. It handles proxy certificates, X509 Extensions and CRL checking. It should be used in SSL_CTX_set_verify().

Parameters:

preverify_ok Communicates the result of default validation steps performed by OpenSSL

x509_context The validation state object.

Returns:

1 on success 0 on failure

4.2.3.6 int globusgsi_callback_check_issued (X509_STORE_CTX * context, X509 * cert, X509 * issuer)

This function wraps the OpenSSL X509_check_issued() call and catches the error caused by the fact that a proxy certificate issuer may not have to have the correct KeyUsage fields set.

Parameters:

context The validation state object.

cert The certificate to check

issuer The issuer certificate to check

Returns:

1 on success 0 on failure

4.3 Callback Data Functions

Functions that deal with the data structure that contains state associated with the path validation callback.

Initializing and destroying a callback data structure

globus_result_t globus_gsi_callback_data_init (globus_gsi_callback_data_t callback_data)
globus_result_t globus_gsi_callback_data_destroy(globus_gsi_callback_data_t callback_data)

Copying a callback data structure

globus_result_t globus_gsi_callback_data_copy (globus_gsi_callback_data_t source, globus_gsi_callback_data_t dest)

Getting and setting the certificate chain depth

globus_result_t globus_gsi_callback_get_cert_depth(globus_gsi_callback_data_t callback_data, int *cert_depth)
globus_result_t globus_gsi_callback_set_cert_depth(globus_gsi_callback_data_t callback_data, int cert_depth)

Getting and setting the "proxy chain" depth

globus_result_t globus_gsi_callback_get_proxy_depth (globus_gsi_callback_data_t callback_data, int *proxy_depth)
globus_result_t globus_gsi_callback_set_proxy_depth(globus_gsi_callback_data_t callback_data, int proxy_depth)

Getting and setting the certificate type

globus_result_t globus_gsi_callback_get_cert_type (globus_gsi_callback_data_t callback_data, globus_gsi_cert_utils_cert_type_t *cert_type)
globus_result_t globus_gsi_callback_set_cert_type (globus_gsi_callback_data_t callback_data, globus_gsi_cert_utils_cert_type_t cert_type)

Getting and setting the certificate chain

globus_result_t globus_gsi_callback_get_cert_chain (globus_gsi_callback_data_t callback_data, STACK_OF(X509) *cert_chain)
globus_result_t globus_gsi_callback_set_cert_chain (globus_gsi_callback_data_t callback_data, STACK_OF(X509) cert_chain)

Getting and setting the limited proxy handling setting

globus_result_t globus_gsi_callback_get_multiple_limited_proxy_ok (globus_gsi_callback_data_t callback_data, int *multiple_limited_proxy_ok)
globus_result_t globus_gsi_callback_set_multiple_limited_proxy_ok (globus_gsi_callback_data_t callback_data, int multiple_limited_proxy_ok)

Getting and setting a set of X.509 extension OIDs.

globus_result_t globus_gsi_callback_get_extension_oids (globus_gsi_callback_data_t callback_data, void extension_oids)
globus_result_t globus_gsi_callback_set_extension_oids (globus_gsi_callback_data_t callback_data, void extension_oids)

Getting and setting the trusted certificate directory

globus_result_t globus_gsi_callback_get_cert_dir (globus_gsi_callback_data_t callback_data, char cert_dir)
globus_result_t globus_gsi_callback_set_cert_dir (globus_gsi_callback_data_t callback_data, char cert_dir)

Getting and setting the callback to be called for unknown X.509 extensions

globus_result_t globus_gsi_callback_get_extension_cb (globus_gsi_callback_data_t callback_data, globus_gsi_extension_callback_t extension_cb)
globus_result_t globus_gsi_callback_set_extension_cb (globus_gsi_callback_data_t callback_data, globus_gsi_extension_callback_t extension_cb)

Getting and setting the error status

globus_result_t globus_gsi_callback_get_error (globus_gsi_callback_data_t callback_data, globus_result_t error)
globus_result_t globus_gsi_callback_set_error (globus_gsi_callback_data_t callback_data, globus_result_t error)

Getting and setting the check self-signed policy flag

globus_result_t globus_gsi_callback_get_check_policy_for_self_signed_certs (globus_gsi_callback_data_t callback_data, globus_bool_t check)
globus_result_t globus_gsi_callback_set_check_policy_for_self_signed_certs (globus_gsi_callback_data_t callback_data, globus_bool_t check)

Typedefs

typedef globus_gsi_callback_data_s globus_gsi_callback_data_t

4.3.1 Detailed Description

Functions that deal with the data structure that contains state associated with the path validation callback.

4.3.2 Typedef Documentation

4.3.2.1 typedef struct globus_gsi_callback_data_s globus_gsi_callback_data_t

Callback data typedef.

4.3.3 Function Documentation

4.3.3.1 globus_result_t globus_gsi_callback_data_init (globus_gsi_callback_data_t callback_data)

This function initializes a globus_gsi_callback_data_t.

Parameters:
callback_data Reference to the structure to be initialized

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.2 globus_result_t globus_gsi_callback_data_destroy (globus_gsi_callback_data_t callback_data)

This function destroys a globus_gsi_callback_data_t.

Parameters:
callback_data The structure to be destroyed

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.3 globus_result_t globus_gsi_callback_data_copy (globus_gsi_callback_data_t source, globus_gsi_callback_data_t dest)

This function copies a globus_gsi_callback_data_t.

Parameters:
source The structure to be copied

dest The destination of the copy

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.4 globus_result_t globus_gsi_callback_get_cert_depth (globus_gsi_callback_data_t callback_data, int cert_depth)

This function returns the certificate chain depth.

Parameters:
callback_data The globus_gsi_callback_data_t to retrieve the depth from

cert_depth The returned certificate chain depth

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.5 globus_result_t globus_gsi_callback_set_cert_depth (globus_gsi_callback_data_t callback_data, int cert_depth)

This function sets the certificate chain depth.

Parameters:
callback_data The globus_gsi_callback_data_t to retrieve the depth from
cert_depth The certificate chain depth

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.6 globus_result_t globus_gsi_callback_get_proxy_depth (globus_gsi_callback_data_t callback_data, int proxy_depth)

This function returns the number of proxies in the certificate chain.

Parameters:
callback_data The globus_gsi_callback_data_t to retrieve the depth from
proxy_depth The returned "proxy chain" depth

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.7 globus_result_t globus_gsi_callback_set_proxy_depth (globus_gsi_callback_data_t callback_data, int proxy_depth)

This function sets the number of proxies in the certificate chain.

Parameters:
callback_data The globus_gsi_callback_data_t to retrieve the depth from
proxy_depth The "proxy chain" depth

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.8 globus_result_t globus_gsi_callback_get_cert_type (globus_gsi_callback_data_t callback_data, globus_gsi_cert_utils_cert_type_t cert_type)

This function returns the certificate type of the certificate currently being processed.

Parameters:
callback_data The globus_gsi_callback_data_t to retrieve the certificate type from
cert_type Variable containing the certificate type on return

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.9 globus_result_t globus_gsi_callback_set_cert_type (globus_gsi_callback_data_t callback_data, globus_gsi_cert_utils_cert_type_t cert_type)

This function sets the certificate type of the certificate currently being processed.

Parameters:

callback_data The globus_gsi_callback_data_t to set the certificate type on

cert_type The certificate type

Returns:

GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.10 globus_result_t globus_gsi_callback_get_cert_chain (globus_gsi_callback_data_t callback_data, STACK_OF(X509) cert_chain)

This function returns the certificate chain associated with the callback data.

Parameters:

callback_data The globus_gsi_callback_data_t to retreive the certificate chain from.

cert_chain Contains the certificate chain upon successful return

Returns:

GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.11 globus_result_t globus_gsi_callback_set_cert_chain (globus_gsi_callback_data_t callback_data, STACK_OF(X509) cert_chain)

This function sets the certificate chain associated with the callback data.

Parameters:

callback_data The globus_gsi_callback_data_t to set the certificate chain on

cert_chain The certificate chain

Returns:

GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.12 globus_result_t globus_gsi_callback_get_multiple_limited_proxy_ok (globus_gsi_callback_data_t callback_data, int multiple_limited_proxy_ok)

This function gets the value of the limited proxy handling setting. This setting determines whether path validation will accept limited proxies that have been further delegated, ie certificate chains with a limited proxy followed by further proxies.

Parameters:

callback_data The globus_gsi_callback_data_t to get the limited proxy setting from

multiple_limited_proxy_ok Contains the value of the setting upon successful return.

Returns:

GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

Deprecated:

This function always returns true now. It will be removed in the next release.

4.3.3.13 globus_result_t globus_gsi_callback_set_multiple_limited_proxy_ok (globus_gsi_callback_data_t callback_data, int multiple_limited_proxy_ok)

This function sets the value of the limited proxy handling setting. This setting determines whether path validation will accept limited proxies that have been further delegated, ie certificate chains with a limited proxy followed by further proxies.

Parameters:
callback_data The globus_gsi_callback_data_t to set the limited proxy setting on
multiple_limited_proxy_ok The value of the setting

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

Deprecated:
This function has been turned into a no-op. It will be removed in the next release.

4.3.3.14 globus_result_t globus_gsi_callback_get_extension_oids (globus_gsi_callback_data_t callback_data, void extension_oids)

This function gets a list of X.509 extension OIDs that may be used by the extensions callback to allow or disallow certain extensions.

Parameters:
callback_data The globus_gsi_callback_data_t to get the array of extension OIDs from.
extension_oids Contains the list of extension OIDs upon successful return.

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.15 globus_result_t globus_gsi_callback_set_extension_oids (globus_gsi_callback_data_t callback_data, void extension_oids)

This function sets a list of X.509 extension OIDs that may be used by the extensions callback to allow or disallow certain extensions.

Parameters:
callback_data The globus_gsi_callback_data_t to get the array of extension OIDs from.
extension_oids The list of extension OIDs

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.16 globus_result_t globus_gsi_callback_get_cert_dir (globus_gsi_callback_data_t callback_data, char cert_dir)

This function gets the trusted certificate directory from the callback data.

Parameters:
callback_data The globus_gsi_callback_data_t to get the trusted certificates directory from.
cert_dir Contains the path to the trusted certificate directory upon successful return.

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.17 globus_result_t globus_gsi_callback_set_cert_dir (globus_gsi_callback_data_t callback_data, char cert_dir)

This function sets the trusted certi cate directory on the callback data.

Parameters:

callback_data The globus_gsi_callback_data_t to set the trusted certi cates directory on.

cert_dir The path to the trusted certi cate directory

Returns:

GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.18 globus_result_t globus_gsi_callback_get_extension_cb (globus_gsi_callback_data_t callback_data, globus_gsi_extension_callback_t extension_cb)

This function gets the callback that is called for unknown X.509 extensions.

Parameters:

callback_data The globus_gsi_callback_data_t to get the callback information from

extension_cb Contains the extension callback upon successful return.

Returns:

GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.19 globus_result_t globus_gsi_callback_set_extension_cb (globus_gsi_callback_data_t callback_data, globus_gsi_extension_callback_t extension_cb)

This function sets the callback that is called for unknown X.509 extensions.

Parameters:

callback_data The globus_gsi_callback_data_t to set the callback information on

extension_cb The extension callback

Returns:

GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.20 globus_result_t globus_gsi_callback_get_error (globus_gsi_callback_data_t callback_data, globus_result_t error)

This function gets the error status stored in the callback data.

Parameters:

callback_data The globus_gsi_callback_data_t to get the error from

error Contains the error upon successful return.

Returns:

GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.21 globus_result_t globus_gsi_callback_set_error (globus_gsi_callback_data_t callback_data, globus_result_t error)

This function sets the error status stored in the callback data.

Parameters:
callback_data The globus_gsi_callback_data_t to set the error on

error The error

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

4.3.3.22 globus_result_t globus_gsi_callback_get_check_policy_for_self_signed_certs (globus_gsi_callback_data_t callback_data, globus_bool_t check)

This function gets the value of the "check policy for self-signed certificates flag" in the callback data. If this is set than the CA signing policy for a self-signed certificate must include a policy line that allows it to sign itself.

Parameters:
callback_data The globus_gsi_callback_data_t to get the error from

check Contains the value of the flag upon successful return.

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

Since:
Globus Toolkit 4.2.1

4.3.3.23 globus_result_t globus_gsi_callback_set_check_policy_for_self_signed_certs (globus_gsi_callback_data_t callback_data, globus_bool_t check)

This function sets the value of the "check policy for self-signed certificates flag" in the callback data. If this is set than the CA signing policy for a self-signed certificate must include a policy line that allows it to sign itself.

Parameters:
callback_data The globus_gsi_callback_data_t to set the error on

check New value of the flag

Returns:
GLOBUS_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

Since:
Globus Toolkit 4.2.1

4.4 GSI Callback Constants

Enumerations

enum globus_gsi_callback_error_t { GLOBUS_GSI_CALLBACK_ERROR_SUCCESS = 0, GLOBUS_GSI_CALLBACK_ERROR_VERIFY_CRED = 1, GLOBUS_GSI_CALLBACK_ERROR_CERT_NOT_YET_

VALID = 2, GLOBUS_GSI_CALLBACK_ERROR_CANT_GET_LOCAL_CA_CERT = 3, GLOBUS_GSI_CALLBACK_ERROR_CERT_HAS_EXPIRED = 4, GLOBUS_GSI_CALLBACK_ERROR_INVALID_PROXY = 5, GLOBUS_GSI_CALLBACK_ERROR_LIMITED_PROXY = 6, GLOBUS_GSI_CALLBACK_ERROR_INVALID_CRL = 7, GLOBUS_GSI_CALLBACK_ERROR_REVOKED_CERT = 8, GLOBUS_GSI_CALLBACK_ERROR_MIXING_DIFFERENT_PROXY_TYPES = 9, GLOBUS_GSI_CALLBACK_ERROR_WITH_SIGNING_POLICY = 10, GLOBUS_GSI_CALLBACK_ERROR_OLD_GAA = 11, GLOBUS_GSI_CALLBACK_ERROR_CALLBACK_DATA = 12, GLOBUS_GSI_CALLBACK_ERROR_ERRNO = 13, GLOBUS_GSI_CALLBACK_ERROR_CERT_CHAIN = 14, GLOBUS_GSI_CALLBACK_ERROR_WITH_CALLBACK_DATA_INDEX = 15, GLOBUS_GSI_CALLBACK_ERROR_PROXY_PATH_LENGTH_EXCEEDED = 16, GLOBUS_GSI_CALLBACK_ERROR_LAST = 18 g

4.4.1 Enumeration Type Documentation

4.4.1.1 enum globus_gsi_callback_error_t

GSI Callback Error codes.

Enumeration values:

GLOBUS_GSI_CALLBACK_ERROR_SUCCESS Success - never used.

GLOBUS_GSI_CALLBACK_ERROR_VERIFY_CRED Error verifying credential.

GLOBUS_GSI_CALLBACK_ERROR_CERT_NOT_YET_VALID The certi cate is not yet valid.

GLOBUS_GSI_CALLBACK_ERROR_CANT_GET_LOCAL_CA_CERT Unable to discover a local trusted CA for a given cerit cate.

GLOBUS_GSI_CALLBACK_ERROR_CERT_HAS_EXPIRED The certi cate has expired.

GLOBUS_GSI_CALLBACK_ERROR_INVALID_PROXY The proxy format is invalid.

GLOBUS_GSI_CALLBACK_ERROR_LIMITED_PROXY Limited proxies are not accepted.

GLOBUS_GSI_CALLBACK_ERROR_INVALID_CRL Invalid CRL.

GLOBUS_GSI_CALLBACK_ERROR_REVOKED_CERT The certi cate has been revoked.

GLOBUS_GSI_CALLBACK_ERROR_MIXING_DIFFERENT_PROXY_TYPES The cert chain contains both legacy on rfc compliant proxies.

GLOBUS_GSI_CALLBACK_ERROR_WITH_SIGNING_POLICY Could not verify certi cate chain against the signing policy for the issuing CA.

GLOBUS_GSI_CALLBACK_ERROR_OLD_GAA OldGAA error.

GLOBUS_GSI_CALLBACK_ERROR_CALLBACK_DATA Error with the callback data structure.

GLOBUS_GSI_CALLBACK_ERROR_ERRNO System error.

GLOBUS_GSI_CALLBACK_ERROR_CERT_CHAIN Error setting or getting the cert chain from callback data.

GLOBUS_GSI_CALLBACK_ERROR_WITH_CALLBACK_DATA_INDEX Error getting callback data index.

GLOBUS_GSI_CALLBACK_ERROR_PROXY_PATH_LENGTH_EXCEEDED Exceeded the path length speci ed in the proxy cert info extension.

GLOBUS_GSI_CALLBACK_ERROR_LAST Last marker - never used.

5 globus gsi callback Page Documentation

5.1 Deprecated List

Global globus_gsi_callback_get_multiple_limited_proxy_ok(globus_gsi_callback_data_t callback_data, int multiple_limited_pr
This function always returns true now. It will be removed in the next release.

Global globus_gsi_callback_set_multiple_limited_proxy_ok(globus_gsi_callback_data_t callback_data, int multiple_limited_pro
This function has been turned into a no-op. It will be removed in the next release.

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