

# globus gsi cert utils Reference Manual

## 5.5

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## 1 Globus GSI Certificate Handling Utilities

The Globus GSI Certificate Handling Utilities library. This library contains helper functions for dealing with certificates.

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## 2 globus gsi cert utils Module Index

### 2.1 globus gsi cert utils Modules

Here is a list of all modules:

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## 3 globus gsi cert utils Module Documentation

### 3.1 Activation

Globus GSI Cert Utils uses standard Globus module activation and deactivation.

Defines

```
#define GLOBUS\_GSI\_CERT\_UTILS\_MODULE
```

#### 3.1.1 Detailed Description

Globus GSI Cert Utils uses standard Globus module activation and deactivation.

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

```
globus_module_activate(GLOBUS_GSI_CERT_UTILS_MODULE)
```



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

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

```
globus_module_deactivate(GLOBUS_GSI_CERT_UTILS_MODULE)
```

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

### 3.1.2 De ne Documentation

#### 3.1.2.1 #de ne GLOBUSGSI\_CERT\_UTILS\_MODULE

Module descriptor.

## 3.2 Cert Utils Functions

A generic set of utility functions for manipulating OpenSSL objects, such as X509 certificates.

Convert ASN1\_UTCTIME to time\_t

```
globus_result_t globusgsi_cert_utils_maketime (ASN1_UTCTIME ctm, time_t newtime)
```

Get the X509 certificate type (EEC, CA, proxy type, etc.)

```
globus_result_t globusgsi_cert_utils_get_cert_type (X509 cert, globusgsi_cert_utils_cert_type_t type)
```

Get the certificate name

```
globus_result_t globusgsi_cert_utils_get_x509_name (char subjectstring, int length, X509_NAME x509_name)
```

Get the base certificate name

```
globus_result_t globusgsi_cert_utils_get_basename (X509_NAME subject, STACK_OF(X509) certchain)
```

Functions

```
globus_result_t globusgsi_cert_utils_get_eec (STACK_OF(X509) certchain, X509 eec)
```

### 3.2.1 Detailed Description

A generic set of utility functions for manipulating OpenSSL objects, such as X509 certificates.



## 3.2.2 Function Documentation

3.2.2.1 `globusresult_t globus_gsi_cert_utils_make_time (ASN1_UTCTIME ctm, time_t newtime)`

Convert a ASN1\_UTCTIME structure to a time\_t.

Parameters:

ctm The ASN1\_UTCTIME to convert

newtime The converted time

Returns:

GLOBUS\_SUCCESS or an error captured in a `globusresult_t`

3.2.2.2 `globusresult_t globus_gsi_cert_utils_get_cert_type (X509 cert, globus_gsi_cert_utils_cert_type_t type)`

Determine the type of the given X509 certificate. For the list of possible values returned, see `globus_gsi_cert_utils_cert_type_t`.

Parameters:

cert The X509 certificate

type The returned X509 certificate type

Returns:

GLOBUS\_SUCCESS or an error captured in a `globusresult_t`

3.2.2.3 `globusresult_t globus_gsi_cert_utils_get_x509_name (char subjectstring, int length, X509_NAME x509_name)`

Get the X509\_NAME from a subject string.

OpenSSL doesn't provide this function, probably because it shouldn't be used. If you are getting an X509 from just a string, it's impossible to verify its integrity.

Parameters:

subjectstring The subject in the format: "/O=Grid/OU=..."

length The length of the subject string

x509\_name The resulting X509\_NAME object

Returns:

GLOBUS\_SUCCESS unless an error occurred, in which case, a globus error object ID is returned

3.2.2.4 `globusresult_t globus_gsi_cert_utils_get_basename (X509_NAME subject, STACK_OF(X509) cert_chain)`

Get the base name of a proxy certificate.

Given an X509 name, strip off the proxy related /CN components to get the base name of the certificate's subject

Parameters:

subject Pointer to an X509\_NAME object which gets stripped



`cert.chain` The certificate chain used to detect the number of CNs to strip. This is done by figuring out the number of proxies in the chain.

Returns:

`GLOBUS.SUCCESS`

3.2.2.5 `globusresult_t globus_gsi_cert_utils_get_eec (STACK_OF(X509) cert_chain, X509 **ee)`

Get the end-entity certificate associated with a certificate chain.

Parameters:

`cert_chain` Certificate chain to inspect.

`ee` Pointer to be set to the EEC value from within the cert chain. Must freed by the caller.

### 3.3 Cert Utils Constants

Typedefs

```
typedef enum globus_gsi_cert_utils_cert_type_e globus_gsi_cert_utils_cert_type_t
```

Enumerations

```
enum globus_gsi_cert_utils_error_t { GLOBUS_GSI_CERT_UTILS_ERROR_SUCCESS = 0, GLOBUS_GSI_CERT_UTILS_ERROR_GETTING_NAME_ENTRY_OF_SUBJECT = 1, GLOBUS_GSI_CERT_UTILS_ERROR_COPYING_SUBJECT = 2, GLOBUS_GSI_CERT_UTILS_ERROR_GETTING_CN_ENTRY = 3, GLOBUS_GSI_CERT_UTILS_ERROR_ADDING_CN_TO_SUBJECT = 4, GLOBUS_GSI_CERT_UTILS_ERROR_OUT_OF_MEMORY = 5, GLOBUS_GSI_CERT_UTILS_ERROR_UNEXPECTED_FORMAT = 6, GLOBUS_GSI_CERT_UTILS_ERROR_NON_COMPLIANT_PROXY = 7, GLOBUS_GSI_CERT_UTILS_ERROR_DETERMINING_CERT_TYPE = 8, GLOBUS_GSI_CERT_UTILS_ERROR_LAST = 9 }
enum globus_gsi_cert_utils_cert_type_e { GLOBUS_GSI_CERT_UTILS_TYPE_DEFAULT = 0, GLOBUS_GSI_CERT_UTILS_TYPE_EEC = (1 << 0), GLOBUS_GSI_CERT_UTILS_TYPE_CA = (1 << 1), GLOBUS_GSI_CERT_UTILS_TYPE_GSI2 = (1 << 2), GLOBUS_GSI_CERT_UTILS_TYPE_GSI3 = (1 << 3), GLOBUS_GSI_CERT_UTILS_TYPE_RFC = (1 << 4), GLOBUS_GSI_CERT_UTILS_TYPE_FORMAT_MASK, GLOBUS_GSI_CERT_UTILS_TYPE_IMPERSONATION_PROXY = (1 << 5), GLOBUS_GSI_CERT_UTILS_TYPE_LIMITED_PROXY = (1 << 6), GLOBUS_GSI_CERT_UTILS_TYPE_RESTRICTED_PROXY = (1 << 7), GLOBUS_GSI_CERT_UTILS_TYPE_INDEPENDENT_PROXY = (1 << 8), GLOBUS_GSI_CERT_UTILS_TYPE_PROXY_MASK, GLOBUS_GSI_CERT_UTILS_TYPE_GSI3_IMPERSONATION_PROXY, GLOBUS_GSI_CERT_UTILS_TYPE_GSI3_INDEPENDENT_PROXY, GLOBUS_GSI_CERT_UTILS_TYPE_GSI3_LIMITED_PROXY, GLOBUS_GSI_CERT_UTILS_TYPE_GSI3_RESTRICTED_PROXY, GLOBUS_GSI_CERT_UTILS_TYPE_GSI2_PROXY, GLOBUS_GSI_CERT_UTILS_TYPE_GSI2_LIMITED_PROXY, GLOBUS_GSI_CERT_UTILS_TYPE_RFC_IMPERSONATION_PROXY, GLOBUS_GSI_CERT_UTILS_TYPE_RFC_INDEPENDENT_PROXY, GLOBUS_GSI_CERT_UTILS_TYPE_RFC_LIMITED_PROXY, GLOBUS_GSI_CERT_UTILS_TYPE_RFC_RESTRICTED_PROXY }
```

#### 3.3.1 Typedef Documentation

3.3.1.1 `typedef enum globus_gsi_cert_utils_cert_type_e globus_gsi_cert_utils_cert_type_t`

Certificate Types.



These certificate types are used to describe some properties of a certificate and to specify what type of proxy should be generated in the proxy core code. There are two non-proxy types of certificates understood by Globus: EEC (End-Entity Certificate) and CA (Certificate Authority Certificates), three proxy formats (GSI 2 "legacy" proxies, GSI 3 "Draft" proxies, and RFC 3820-compliant proxies), and four types of proxy (limited, impersonation "full", restricted, and independent). The latter two types are not expressible in the GSI 2 format.

In addition to enumerations for the concrete renderings of certificate format and type combined, there are default, formats-without-types and types-without-formats so that application logic which uses the proxy library can request default proxy formats which are compatible with the issuing certificate.

### 3.3.2 Enumeration Type Documentation

#### 3.3.2.1 enum globusgsi\_cert\_utils\_error\_t

Cert Utils Error Codes.

Enumeration values:

GLOBALBUS\_GSI\_CERT\_UTILS\_ERROR\_SUCCESS Success - never used.

GLOBALBUS\_GSI\_CERT\_UTILS\_ERROR\_GETTING\_NAME\_ENTRY\_OF\_SUBJECT Failed to retrieve a subcomponent of the subject.

GLOBALBUS\_GSI\_CERT\_UTILS\_ERROR\_COPYING\_SUBJECT A error occurred while trying to copy a X.509 subject.

GLOBALBUS\_GSI\_CERT\_UTILS\_ERROR\_GETTING\_CN\_ENTRY Failed to retrieve a CN subcomponent of the subject.

GLOBALBUS\_GSI\_CERT\_UTILS\_ERROR\_ADDING\_CN\_TO\_SUBJECT Failed to add a CN component to a X.509 subject name.

GLOBALBUS\_GSI\_CERT\_UTILS\_ERROR\_OUT\_OF\_MEMORY Out of memory.

GLOBALBUS\_GSI\_CERT\_UTILS\_ERROR\_UNEXPECTED\_FORMAT Something unexpected happen while converting a string subject to a X509NAME structure.

GLOBALBUS\_GSI\_CERT\_UTILS\_ERROR\_NON\_COMPLIANT\_PROXY Proxy does not comply with the expected format.

GLOBALBUS\_GSI\_CERT\_UTILS\_ERROR\_DETERMINING\_CERT\_TYPE Couldn't determine the certificate type.

GLOBALBUS\_GSI\_CERT\_UTILS\_ERROR\_LAST Last marker - never used.

#### 3.3.2.2 enum globusgsi\_cert\_utils\_cert\_type\_e

Certificate Types.

These certificate types are used to describe some properties of a certificate and to specify what type of proxy should be generated in the proxy core code. There are two non-proxy types of certificates understood by Globus: EEC (End-Entity Certificate) and CA (Certificate Authority Certificates), three proxy formats (GSI 2 "legacy" proxies, GSI 3 "Draft" proxies, and RFC 3820-compliant proxies), and four types of proxy (limited, impersonation "full", restricted, and independent). The latter two types are not expressible in the GSI 2 format.

In addition to enumerations for the concrete renderings of certificate format and type combined, there are default, formats-without-types and types-without-formats so that application logic which uses the proxy library can request default proxy formats which are compatible with the issuing certificate.

Enumeration values:

GLOBALBUS\_GSI\_CERT\_UTILS\_TYPE\_DEFAULT Default proxy type.



GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_EEC A end entity certificate.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_CA A CA certificate.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_GSI\_2 Legacy Proxy Format.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_GSI\_3 X.509 Proxy Certificate Profile (draft) Proxy Format.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_RFC X.509 Proxy Certificate Profile Compliant Proxy Format.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_FORMAT\_MASK Proxy certificate formats mask.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_IMPERSONATION\_PROXY Impersonation proxy type.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_LIMITED\_PROXY Limited proxy type.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_RESTRICTED\_PROXY Restricted proxy type.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_INDEPENDENT\_PROXY Independent proxy type.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_PROXY\_MASK Proxy types mask.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_GSI\_3\_IMPERSONATION\_PROXY A X.509 Proxy Certificate Profile (pre-RFC) compliant impersonation proxy.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_GSI\_3\_INDEPENDENT\_PROXY A X.509 Proxy Certificate Profile (pre-RFC) compliant independent proxy.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_GSI\_3\_LIMITED\_PROXY A X.509 Proxy Certificate Profile (pre-RFC) compliant limited proxy.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_GSI\_3\_RESTRICTED\_PROXY A X.509 Proxy Certificate Profile (pre-RFC) compliant restricted proxy.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_GSI\_2\_PROXY A legacy Globus impersonation proxy.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_GSI\_2\_LIMITED\_PROXY A legacy Globus limited impersonation proxy.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_RFC\_IMPERSONATION\_PROXY A X.509 Proxy Certificate Profile RFC compliant impersonation proxy.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_RFC\_INDEPENDENT\_PROXY A X.509 Proxy Certificate Profile RFC compliant independent proxy.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_RFC\_LIMITED\_PROXY A X.509 Proxy Certificate Profile RFC compliant limited proxy.

GLOBUS\_GSI\_CERT\_UTILS\_TYPE\_RFC\_RESTRICTED\_PROXY A X.509 Proxy Certificate Profile RFC compliant restricted proxy.



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