

# globus rls client

## 5.2

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## 1 Main Page

The Globus Replica Location Service (RLS) C API provides functions to view and update data in a RLS catalog. There are 2 types of RLS servers, Local Replica Catalog (LRC) servers, which maintain Logical to Physical File Name mappings (LFN to PFN), and Replica Location Index (RLI) servers, which maintain LFN to LRC mappings. Note an RLS server can act as both an LRC and RLI server.

Functions are divided into the following groups:

- [Activation](#)
- [Connection Management](#)
- [Operations on an LRC server](#)
- [Operations on an RLI server](#)
- [Miscellaneous Types and Functions](#)
- [Query Results](#)
- [Status Codes](#)

Applications using this API should include **globus\_rls\_client.h**, and be linked with the library **globus\_rls\_client-FLAVOR**.

## 2 Module Index

### 2.1 Modules

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### 3.1 Data Structures

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## 4 Module Documentation

### 4.1 Status Codes

All of the functions in the API that return status return it in a globus\_result\_t structure.

#### Defines

- `#define GLOBUS_RLS_SUCCESS 0`
- `#define GLOBUS_RLS_GLOBUSERR 1`
- `#define GLOBUS_RLS_INVHANDLE 2`
- `#define GLOBUS_RLS_BADURL 3`
- `#define GLOBUS_RLS_NOMEMORY 4`
- `#define GLOBUS_RLS_OVERFLOW 5`
- `#define GLOBUS_RLS_BADARG 6`
- `#define GLOBUS_RLS_PERM 7`
- `#define GLOBUS_RLS_BADMETHOD 8`
- `#define GLOBUS_RLS_INVSERVER 9`
- `#define GLOBUS_RLS_MAPPING_NEXIST 10`
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- `#define GLOBUS_RLS_DBERROR` 17
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- `#define GLOBUS_RLS_MAPPING_EXIST` 20
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- `#define GLOBUS_RLS_UNSUPPORTED` 26
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- `#define GLOBUS_RLS_ATTR_INUSE` 30

#### 4.1.1 Detailed Description

All of the functions in the API that return status return it in a `globus_result_t` structure.

Prior to version 2.0.0 an integer status was returned. The `globus_result_t` structure includes an integer "type" which is set to one of the status codes defined below (the same values that were returned by earlier versions of the API). The function `globus_rls_client_error_info()` may be used to extract the status code and/or error message from a `globus_result_t`. `GLOBUS_SUCCESS` is returned when the operation was successful.

#### 4.1.2 Define Documentation

##### 4.1.2.1 `#define GLOBUS_RLS_SUCCESS 0`

Operation succeeded.

##### 4.1.2.2 `#define GLOBUS_RLS_GLOBUSERR 1`

An error was returned by the Globus I/O module.

##### 4.1.2.3 `#define GLOBUS_RLS_INVHANDLE 2`

The `globus_rls_handle_t` handle is invalid.

##### 4.1.2.4 `#define GLOBUS_RLS_BADURL 3`

The URL could not be parsed.

##### 4.1.2.5 `#define GLOBUS_RLS_NOMEMORY 4`

Out of memory.

##### 4.1.2.6 `#define GLOBUS_RLS_OVERFLOW 5`

A result was too large to fit in buffer.

#### **4.1.2.7 #define GLOBUS\_RLS\_BADARG 6**

Bad argument (eg NULL where string pointer expected).

#### **4.1.2.8 #define GLOBUS\_RLS\_PERM 7**

Client does not have permission for requested action.

#### **4.1.2.9 #define GLOBUS\_RLS\_BADMETHOD 8**

RPC error, invalid method name sent to server.

#### **4.1.2.10 #define GLOBUS\_RLS\_INVSERVER 9**

LRC request made to RLI server or vice versa.

#### **4.1.2.11 #define GLOBUS\_RLS\_MAPPING\_NEXIST 10**

LFN,PFN (LRC) or LFN,LRC (RLI) mapping doesn't exist.

#### **4.1.2.12 #define GLOBUS\_RLS\_LFN\_EXIST 11**

LFN already exists in LRC or RLI database.

#### **4.1.2.13 #define GLOBUS\_RLS\_LFN\_NEXIST 12**

LFN doesn't exist in LRC or RLI database.

#### **4.1.2.14 #define GLOBUS\_RLS\_PFN\_EXIST 13**

PFN already exists in LRC database.

#### **4.1.2.15 #define GLOBUS\_RLS\_PFN\_NEXIST 14**

PFN doesn't exist in LRC database.

#### **4.1.2.16 #define GLOBUS\_RLS\_LRC\_EXIST 15**

LRC already exists in LRC or RLI database.

#### **4.1.2.17 #define GLOBUS\_RLS\_LRC\_NEXIST 16**

LRC doesn't exist in RLI database.

#### **4.1.2.18 #define GLOBUS\_RLS\_DBERROR 17**

Database error.

#### **4.1.2.19 #define GLOBUS\_RLS\_RLI\_EXIST 18**

RLI already exists in LRC database.

#### **4.1.2.20 #define GLOBUS\_RLS\_RLI\_NEXIST 19**

RLI doesn't exist in LRC.

#### **4.1.2.21 #define GLOBUS\_RLS\_MAPPING\_EXISTS 20**

LFN,PFN (LRC) or LFN,LRC (RLI) mapping already exists.

#### **4.1.2.22 #define GLOBUS\_RLS\_INV\_ATTR\_TYPE 21**

Invalid attribute type, see globus\_rls\_attr\_type\_t.

#### **4.1.2.23 #define GLOBUS\_RLS\_ATTR\_EXISTS 22**

Attribute already exists.

#### **4.1.2.24 #define GLOBUS\_RLS\_ATTR\_NEXIST 23**

Attribute doesn't exist.

#### **4.1.2.25 #define GLOBUS\_RLS\_INV\_OBJ\_TYPE 24**

Invalid object type, see globus\_rls\_obj\_type\_t.

#### **4.1.2.26 #define GLOBUS\_RLS\_INV\_ATTR\_OP 25**

Invalid attribute search operator, see globus\_rls\_attr\_op\_t.

#### **4.1.2.27 #define GLOBUS\_RLS\_UNSUPPORTED 26**

Operation is unsupported.

#### **4.1.2.28 #define GLOBUS\_RLS\_TIMEOUT 27**

IO timeout.

#### **4.1.2.29 #define GLOBUS\_RLS\_TOO\_MANY\_CONNECTIONS 28**

Too many connections.

#### **4.1.2.30 #define GLOBUS\_RLS\_ATTR\_VALUE\_NEXIST 29**

Attribute with specified value not found.

#### **4.1.2.31 #define GLOBUS\_RLS\_ATTR\_INUSE 30**

Attribute in use by some object, can't be deleted.

## **4.2 Miscellaneous**

Miscellaneous functions and types.

### **Data Structures**

- struct [globus\\_rls\\_attribute\\_t](#)  
*Object (LFN or PFN) attribute type.*

- struct [globus\\_rls\\_stats\\_t](#)

*Various configuration options and statistics about an RLS server returned in the following structures by [globus\\_rls\\_client\\_stats\(\)](#).*

## Defines

- #define [RLS\\_LRCSERVER](#) 0x1
- #define [RLS\\_RLISERVER](#) 0x2
- #define [RLS\\_RCVLFNLIST](#) 0x4
- #define [RLS\\_RCVBLOOMFILTER](#) 0x8
- #define [RLS\\_SNDLFNLIST](#) 0x10
- #define [RLS\\_SNDBLOOMFILTER](#) 0x20
- #define [RLS\\_INITIALIZED](#) 0x40

## Enumerations

- enum [globus\\_rls\\_pattern\\_t](#) {  
    [rls\\_pattern\\_unix](#),  
    [rls\\_pattern\\_sql](#) }
- enum [globus\\_rls\\_attr\\_type\\_t](#) {  
    [globus\\_rls\\_attr\\_type\\_date](#),  
    [globus\\_rls\\_attr\\_typeflt](#),  
    [globus\\_rls\\_attr\\_type\\_int](#),  
    [globus\\_rls\\_attr\\_type\\_str](#) }
- enum [globus\\_rls\\_obj\\_type\\_t](#) {  
    [globus\\_rls\\_obj\\_lrc\\_lfn](#),  
    [globus\\_rls\\_obj\\_lrc\\_pfn](#),  
    [globus\\_rls\\_obj\\_rli\\_lfn](#),  
    [globus\\_rls\\_obj\\_rli\\_lrc](#) }
- enum [globus\\_rls\\_attr\\_op\\_t](#) {  
    [globus\\_rls\\_attr\\_op\\_all](#),  
    [globus\\_rls\\_attr\\_op\\_eq](#),  
    [globus\\_rls\\_attr\\_op\\_ne](#),  
    [globus\\_rls\\_attr\\_op\\_gt](#),  
    [globus\\_rls\\_attr\\_op\\_ge](#),  
    [globus\\_rls\\_attr\\_op\\_lt](#),  
    [globus\\_rls\\_attr\\_op\\_le](#),  
    [globus\\_rls\\_attr\\_op\\_btw](#),  
    [globus\\_rls\\_attr\\_op\\_like](#) }
- enum [globus\\_rls\\_admin\\_cmd\\_t](#) {  
    [globus\\_rls\\_admin\\_cmd\\_ping](#),  
    [globus\\_rls\\_admin\\_cmd\\_quit](#),  
    [globus\\_rls\\_admin\\_cmd\\_ssu](#) }

## Functions

- globus\_result\_t [globus\\_rls\\_client\\_admin](#) (globus\_rls\_handle\_t \*h, globus\_rls\_admin\_cmd\_t cmd)
- globus\_result\_t [globus\\_rls\\_client\\_get\\_configuration](#) (globus\_rls\_handle\_t \*h, char \*option, globus\_list\_t \*\*conf\_list)
- globus\_result\_t [globus\\_rls\\_client\\_set\\_configuration](#) (globus\_rls\_handle\_t \*h, char \*option, char \*value)
- globus\_result\_t [globus\\_rls\\_client\\_stats](#) (globus\_rls\_handle\_t \*h, globus\_rls\_stats\_t \*rlsstats)
- char \* [globus\\_rls\\_client\\_attr2s](#) (globus\_rls\_attribute\_t \*attr, char \*buf, int buflen)
- globus\_result\_t [globus\\_rls\\_client\\_s2attr](#) (globus\_rls\_attr\_type\_t type, char \*sval, globus\_rls\_attribute\_t \*attr)
- globus\_result\_t [globus\\_rls\\_client\\_error\\_info](#) (globus\_result\_t r, int \*rc, char \*buf, int buflen, globus\_bool\_t preserve)
- int [globus\\_list\\_len](#) (globus\_list\_t \*len)
- char \* [globus\\_rls\\_errmsg](#) (int rc, char \*specificmsg, char \*buf, int buflen)

### 4.2.1 Detailed Description

Miscellaneous functions and types.

### 4.2.2 Define Documentation

#### 4.2.2.1 #define RLS\_LRCSERVER 0x1

Server is LRC server.

#### 4.2.2.2 #define RLS\_RLISERVER 0x2

Server is RLI server.

#### 4.2.2.3 #define RLS\_RCVLFNLIST 0x4

RLI accepts LFN list updates.

#### 4.2.2.4 #define RLS\_RCVBLOOMFILTER 0x8

RLI accepts Bloom filter updates.

#### 4.2.2.5 #define RLS\_SNDLFNLIST 0x10

LRC sends LFN list updates.

#### 4.2.2.6 #define RLS\_SNDBLOOMFILTER 0x20

LRC sends Bloom filter updates.

#### 4.2.2.7 #define RLS\_INITIALIZED 0x40

RLC is fully initialized.

### 4.2.3 Enumeration Type Documentation

#### 4.2.3.1 enum globus\_rls\_pattern\_t

Wildcard character style.

**Enumerator:**

*rls\_pattern\_unix* Unix file globbing chars (\*, ?).

*rls\_pattern\_sql* SQL "like" wildcards (% , \_).

#### 4.2.3.2 enum globus\_rls\_attr\_type\_t

Attribute Value Types.

**Enumerator:**

*globus\_rls\_attr\_type\_date* Date (time\_t).

*globus\_rls\_attr\_typeflt* Floating point (double).

*globus\_rls\_attr\_type\_int* Integer (int).

*globus\_rls\_attr\_type\_str* String (char \*).

#### 4.2.3.3 enum globus\_rls\_obj\_type\_t

Object types in LRC and RLI databases.

**Enumerator:**

*globus\_rls\_obj\_lrc\_lfn* LRC Logical File Name.

*globus\_rls\_obj\_lrc\_pfn* LRC Physical File Name.

*globus\_rls\_obj\_rli\_lfn* RLI Logical File Name.

*globus\_rls\_obj\_rli\_lrc* RLI LRC URL.

#### 4.2.3.4 enum globus\_rls\_attr\_op\_t

Attribute Value Query Operators.

**Enumerator:**

*globus\_rls\_attr\_op\_all* All values returned.

*globus\_rls\_attr\_op\_eq* Values matching operand 1 returned.

*globus\_rls\_attr\_op\_ne* Values not matching operand 1.

*globus\_rls\_attr\_op\_gt* Values greater than operand 1.

*globus\_rls\_attr\_op\_ge* Values greater than or equal to op1.

*globus\_rls\_attr\_op\_lt* Values less than operand 1.

*globus\_rls\_attr\_op\_le* Values less than or equal to op1.

*globus\_rls\_attr\_op\_btw* Values between operand1 and 2.

*globus\_rls\_attr\_op\_like* Strings "like" operand1 (SQL like).

#### 4.2.3.5 enum globus\_rls\_admin\_cmd\_t

[globus\\_rls\\_client\\_admin\(\)](#) commands.

##### Enumerator:

*globus\_rls\_admin\_cmd\_ping* Verify RLS server responding.

*globus\_rls\_admin\_cmd\_quit* Tell RLS server to exit.

*globus\_rls\_admin\_cmd\_ssu* Tell LRC server to do softstate update.

#### 4.2.4 Function Documentation

##### 4.2.4.1 globus\_result\_t globus\_rls\_client\_admin (globus\_rls\_handle\_t \* *h*, globus\_rls\_admin\_cmd\_t *cmd*)

Miscellaneous administrative operations.

Most operations require the admin privilege.

##### Parameters:

*h* Handle connected to RLS server.

*cmd* Command to be sent to RLS server.

##### Return values:

**GLOBUS\_SUCCESS** Command succeeded.

##### 4.2.4.2 globus\_result\_t globus\_rls\_client\_get\_configuration (globus\_rls\_handle\_t \* *h*, char \* *option*, globus\_list\_t \*\* *conf\_list*)

Get server configuration.

Client needs admin privilege.

##### Parameters:

*h* Handle connected to RLS server.

*option* Configuration option to get. If NULL all options are retrieved.

##### Return values:

*conf\_list* List of configuration options.

**GLOBUS\_SUCCESS** List of retrieved config options returned in *conf\_list*, each datum is of type [globus\\_rls\\_string2\\_t](#). *conf\_list* should be freed with [globus\\_rls\\_client\\_free\\_list\(\)](#). There may be multiple "acl" entries in the list, since the access control list can include more than one entry. Each acl configuration value is consists of a regular expression (matched against grid-mapfile users or DNs), a colon, and space separated list of permissions the matching users are granted.

##### 4.2.4.3 globus\_result\_t globus\_rls\_client\_set\_configuration (globus\_rls\_handle\_t \* *h*, char \* *option*, char \* *value*)

Set server configuration option.

Client needs admin privilege.

**Parameters:**

*h* Handle connected to RLS server.  
*option* Configuration option to set.  
*value* New value for option.

**Return values:**

**GLOBAL\_SUCCESS** Option set on server.

**4.2.4.4 globus\_result\_t globus\_qls\_client\_stats (globus\_qls\_handle\_t \* *h*, globus\_qls\_stats\_t \* *qlsstats*)**

Retrieve various statistics from RLS server.

Requires stats privilege.

**Parameters:**

*h* Handle connected to RLS server.  
*qlsstats* Stats returned here.

**Return values:**

**GLOBAL\_SUCCESS** Stats returned in *qlsstats*.

**4.2.4.5 char\* globus\_qls\_client\_attr2s (globus\_qls\_attribute\_t \* *attr*, char \* *buf*, int *buflen*)**

Map attribute value to string.

**Parameters:**

*attr* Attribute to convert. If *attr->type* is [globus\\_qls\\_attr\\_type\\_date](#) then the resulting string will be in the format MySQL uses by default, which is YYYYMMDDHHMMSS.  
*buf* Buffer to write string value to. Note if *attr->type* is [globus\\_qls\\_attr\\_type\\_str](#) then *attr->val.s* is returned, and *buf* is unused.  
*buflen* Size of *buf* in bytes.

**Return values:**

**String Value** Attribute value converted to a string.

**4.2.4.6 globus\_result\_t globus\_qls\_client\_s2attr (globus\_qls\_attr\_type\_t *type*, char \* *sval*, globus\_qls\_attribute\_t \* *attr*)**

Set [globus\\_qls\\_attribute\\_t](#) type and val fields from a type and string value.

**Parameters:**

*type* Attribute value type.  
*sval* String value to convert to binary. If type is [globus\\_qls\\_attr\\_type\\_date](#) *sval* should be in the form YYYY-MM-DD HH:MM:SS.  
*attr* Attribute whose type and val fields are to be set.

**Return values:**

**GLOBAL\_SUCCESS** *attr->type* and *attr->val* successfully set.

#### 4.2.4.7 `globus_result_t globus_rls_client_error_info (globus_result_t r, int * rc, char * buf, int buflen, globus_bool_t preserve)`

Get error code and message from `globus_result_t` returned by this API.

##### Parameters:

- r* Result returned by RLS API function. *r* is freed by this call and should not be referenced again. If *preserve* is set then a new `globus_result_t` is constructed with the same values and returned as the function value.
- rc* Address to store error code at. If NULL error code is not returned.
- buf* Address to store error message at. If NULL error message is not returned.
- preserve* If GLOBUS\_TRUE then a new `globus_result_t` is constructed with the same values as the old and returned as the function value.
- buflen* Size of *buf*.

##### Return values:

- globus\_result\_t* If *preserve* is set a new `globus_result_t` identical to *r* is returned, otherwise GLOBUS\_SUCCESS.

#### 4.2.4.8 `int globus_list_len (globus_list_t * len)`

Compute length of list.

`globus_list_size()` is implemented using recursion, besides being inefficient it can run out of stack space when the list is large.

#### 4.2.4.9 `char* globus_rls_errmsg (int rc, char * specificmsg, char * buf, int buflen)`

Map RLS status code to error string.

##### Parameters:

- rc* Status code.
- specificmsg* If not NULL prepended (with a colon) to error string.
- buf* Buffer to write error message to.
- buflen* Length of *buf*. Message will be truncated to fit if too long.

##### Return values:

- char \** Returns *buf*, error message written to *buf*.

## 4.3 Query Results

List results are returned as `globus_list_t`'s, list datums depend on the type of query (eg [globus\\_rls\\_string2\\_t](#), [globus\\_rls\\_attribute\\_t](#), etc).

### Data Structures

- struct [globus\\_rls\\_attribute\\_object\\_t](#)  
*globus\_rls\_client\_lrc\_attr\_search()* returns a list of these structures which include the object name (LFN or PFN) and attribute value found by the query.

- struct [globus\\_rls\\_string2\\_t](#)  
*String pair result.*
- struct [globus\\_rls\\_string2\\_bulk\\_t](#)  
*String pair result with return code, returned by bulk query operations.*

## Functions

- globus\_result\_t [globus\\_rls\\_client\\_free\\_list](#) (globus\_list\_t \*list)

### 4.3.1 Detailed Description

List results are returned as globus\_list\_t's, list datums depend on the type of query (eg [globus\\_rls\\_string2\\_t](#), [globus\\_rls\\_attribute\\_t](#), etc).

A list result should be freed with [globus\\_rls\\_client\\_free\\_list\(\)](#) when it's no longer needed. RLS supports limiting the number of results returned by a single query using an offset and reslimit. The offset specifies which result to begin with, reslimit specifies how many results to return. Offset should begin at 0 to retrieve all records. If reslimit is 0 then all results are returned at once, unless the server has a limit on results configured. If NULL is passed as the offset argument then the API will repeatedly call the query function until are results are retrieved. The following are equivalent examples of how to print the lfn,pfn pairs returned by [globus\\_rls\\_client\\_lrc\\_get\\_lfn\(\)](#):

```
globus_list_t *str2_list;
globus_list_t *p;
globus_rls_string2_t *str2;

// Retrieve all results, API will handle looping through partial results
// if the server has a limit configured. Error handling has been omitted.
globus_rls_client_lrc_get_lfn(h, "somepfn", NULL, 0, &str2_list);
for (p = str2_list; p; p = globus_list_rest(p)) {
    str2 = (globus_rls_string2_t *) globus_list_first(p);
    printf("lfn: %s pfn:%s\n", str2->s1, str2->s2);
}
globus_rls_client_free_list(str2_list);

// This code fragment retrieves results 5 at a time. Note offset is set
// to -1 when the server has no more results to return.
int offset = 0;

while (globus_rls_client_lrc_get_lfn(h, "somepfn", &offset, 5, &str2_list) == GLOBUS_SUCCESS) {
    for (p = str2_list; p; p = globus_list_rest(p)) {
        str2 = (globus_rls_string2_t *) globus_list_first(p);
        printf("lfn: %s pfn:%s\n", str2->s1, str2->s2);
    }
    globus_rls_client_free_list(str2_list);
    if (offset == -1)
        break;
}
```

### 4.3.2 Function Documentation

#### 4.3.2.1 globus\_result\_t globus\_rls\_client\_free\_list (globus\_list\_t \* list)

Free result list returned by one of the query functions.

#### Parameters:

*list* List returned by one of the query functions.

## Return values:

*GLOBUS\_SUCCESS* List and contents successfully freed.

## 4.4 Activation

This module must be activated before any functions in this API may be used.

### Defines

- #define `GLOBUS_RLS_CLIENT_MODULE` (&globus\_rls\_client\_module)

### Variables

- globus\_module\_descriptor\_t `globus_rls_client_module`

#### 4.4.1 Detailed Description

This module must be activated before any functions in this API may be used.

This module depends on other Globus modules `GLOBUS_COMMON_MODULE` and `GLOBUS_IO_MODULE`, which should be activated first:

```
globus_module_activate(GLOBUS_COMMON_MODULE);  
globus_module_activate(GLOBUS_IO_MODULE);  
globus_module_activate(GLOBUS_RLS_CLIENT_MODULE);
```

When finished modules should be deactivated in reverse order.

#### 4.4.2 Define Documentation

##### 4.4.2.1 #define `GLOBUS_RLS_CLIENT_MODULE` (&globus\_rls\_client\_module)

RLS Module Name.

#### 4.4.3 Variable Documentation

##### 4.4.3.1 globus\_module\_descriptor\_t `globus_rls_client_module`

RLS module.

## 4.5 Connection Management

Functions to open and close connections to an RLS server.

### Defines

- #define `GLOBUS_RLS_URL_SCHEME` "rls"
- #define `GLOBUS_RLS_URL_SCHEME_NOAUTH` "rlsn"
- #define `GLOBUS_RLS_SERVER_DEFPOR` 39281
- #define `MAXERRMSG` 1024

## Functions

- void `globus_rls_client_certificate` (char \*certfile, char \*keyfile)
- void `globus_rls_client_proxy_certificate` (char \*proxy)
- globus\_result\_t `globus_rls_client_connect` (char \*url, globus\_rls\_handle\_t \*\*h)
- globus\_result\_t `globus_rls_client_close` (globus\_rls\_handle\_t \*h)
- int `globus_rls_client_get_timeout` ()
- void `globus_rls_client_set_timeout` (int seconds)

### 4.5.1 Detailed Description

Functions to open and close connections to an RLS server.

### 4.5.2 Define Documentation

#### 4.5.2.1 #define GLOBUS\_RLS\_URL\_SCHEME "rls"

URL scheme to use when connecting to RLS server.

#### 4.5.2.2 #define GLOBUS\_RLS\_URL\_SCHEME\_NOAUTH "rlsn"

URL scheme when connecting to RLS server without authentication.

#### 4.5.2.3 #define GLOBUS\_RLS\_SERVER\_DEFPORT 39281

Default port number that RLS server listens on.

#### 4.5.2.4 #define MAXERRMSG 1024

Maximum length of error messages returned by server.

### 4.5.3 Function Documentation

#### 4.5.3.1 void globus\_rls\_client\_certificate (char \* *certfile*, char \* *keyfile*)

Set certificate used in authentication.

Sets environment variables X509\_USER\_CERT, X509\_USER\_KEY, and clears X509\_USER\_PROXY.

#### Parameters:

*certfile* Name of X509 certificate file.

*keyfile* Name of X509 key file.

#### 4.5.3.2 void globus\_rls\_client\_proxy\_certificate (char \* *proxy*)

Set X509\_USER\_PROXY environment variable to specified file.

#### Parameters:

*proxy* Name of X509 proxy certificate file. If NULL clears X509\_USER\_PROXY.

#### 4.5.3.3 `globus_result_t globus_rls_client_connect (char * url, globus_rls_handle_t ** h)`

Open connection to RLS server.

##### Parameters:

- url* URL of server to connect to. URL scheme should be **RLS** or **RLSN**, eg **RLS://my.host**. If the URL scheme is **RLSN** then no authentication is performed (the RLS server must be started with authentication disabled as well, this option is primarily intended for testing).
- h* If the connection is successful \**h* will be set to the connection handle. This handle is required by all other functions in the API.

##### Return values:

**GLOBUS\_SUCCESS** Handle *h* now connected to RLS server identified by *url*.

#### 4.5.3.4 `globus_result_t globus_rls_client_close (globus_rls_handle_t * h)`

Close connection to RLS server.

##### Parameters:

- h* Connection handle to be closed, previously allocated by [globus\\_rls\\_client\\_connect\(\)](#).

##### Return values:

**GLOBUS\_SUCCESS** Connection closed, *h* is no longer valid.

#### 4.5.3.5 `int globus_rls_client_get_timeout ()`

Get timeout for IO calls to RLS server.

If 0 IO calls do not timeout. The default is 30 seconds.

##### Return values:

*timeout* Seconds to wait before timing out an IO operation.

#### 4.5.3.6 `void globus_rls_client_set_timeout (int seconds)`

Set timeout for IO calls to RLS server.

##### Parameters:

- seconds* Seconds to wait before timing out an IO operation. If 0 IO calls do not timeout. The default is 30 seconds.

## 4.6 LRC Operations

Functions to view and update data managed by a LRC server.

### Data Structures

- struct [globus\\_rls\\_rli\\_info\\_t](#)

Information about RLI server, returned by [globus\\_rls\\_client\\_lrc\\_rli\\_info\(\)](#) and [globus\\_rls\\_client\\_lrc\\_rli\\_list\(\)](#).

## Defines

- #define [FRLI\\_BLOOMFILTER](#) 0x1
- #define [MAXURL](#) 256

## Functions

- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_attr\\_add](#) (globus\_rls\_handle\_t \*h, char \*key, globus\_rls\_attribute\_t \*attr)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_attr\\_add\\_bulk](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*attr\_obj\_list, globus\_list\_t \*\*str2bulk\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_attr\\_create](#) (globus\_rls\_handle\_t \*h, char \*name, globus\_rls\_obj\_type\_t objtype, globus\_rls\_attr\_type\_t type)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_attr\\_delete](#) (globus\_rls\_handle\_t \*h, char \*name, globus\_rls\_obj\_type\_t objtype, globus\_bool\_t clearvalues)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_attr\\_get](#) (globus\_rls\_handle\_t \*h, char \*name, globus\_rls\_obj\_type\_t objtype, globus\_list\_t \*\*attr\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_attr\\_modify](#) (globus\_rls\_handle\_t \*h, char \*key, globus\_rls\_attribute\_t \*attr)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_attr\\_remove](#) (globus\_rls\_handle\_t \*h, char \*key, globus\_rls\_attribute\_t \*attr)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_attr\\_remove\\_bulk](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*attr\_obj\_list, globus\_list\_t \*\*str2bulk\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_attr\\_search](#) (globus\_rls\_handle\_t \*h, char \*name, globus\_rls\_obj\_type\_t objtype, globus\_rls\_attr\_op\_t op, globus\_rls\_attribute\_t \*operand1, globus\_rls\_attribute\_t \*operand2, int \*offset, int reslimit, globus\_list\_t \*\*attr\_obj\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_attr\\_value\\_get](#) (globus\_rls\_handle\_t \*h, char \*key, char \*name, globus\_rls\_obj\_type\_t objtype, globus\_list\_t \*\*attr\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_attr\\_value\\_get\\_bulk](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*keylist, char \*name, globus\_rls\_obj\_type\_t objtype, globus\_list\_t \*\*attr\_obj\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_add](#) (globus\_rls\_handle\_t \*h, char \*lfn, char \*pfn)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_add\\_bulk](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*str2\_list, globus\_list\_t \*\*str2bulk\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_clear](#) (globus\_rls\_handle\_t \*h)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_create](#) (globus\_rls\_handle\_t \*h, char \*lfn, char \*pfn)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_create\\_bulk](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*str2\_list, globus\_list\_t \*\*str2bulk\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_delete](#) (globus\_rls\_handle\_t \*h, char \*lfn, char \*pfn)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_delete\\_bulk](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*str2\_list, globus\_list\_t \*\*str2bulk\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_exists](#) (globus\_rls\_handle\_t \*h, char \*key, globus\_rls\_obj\_type\_t objtype)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_exists\\_bulk](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*keylist, globus\_rls\_obj\_type\_t objtype, globus\_list\_t \*\*str2bulk\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_get\\_lfn](#) (globus\_rls\_handle\_t \*h, char \*pfn, int \*offset, int reslimit, globus\_list\_t \*\*str2\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_get\\_lfn\\_bulk](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*pfnlist, globus\_list\_t \*\*str2bulk\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_get\\_lfn\\_wc](#) (globus\_rls\_handle\_t \*h, char \*pfn\_pattern, globus\_rls\_pattern\_t type, int \*offset, int reslimit, globus\_list\_t \*\*str2\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_get\\_pfn](#) (globus\_rls\_handle\_t \*h, char \*lfn, int \*offset, int reslimit, globus\_list\_t \*\*str2\_list)
- globus\_result\_t [globus\\_rls\\_client\\_lrc\\_get\\_pfn\\_bulk](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*lfnlist, globus\_list\_t \*\*str2bulk\_list)

- globus\_result\_t [globus\\_uls\\_client\\_lrc\\_get\\_pfn\\_wc](#) (globus\_uls\_handle\_t \*h, char \*lfn\_pattern, [globus\\_uls\\_pattern\\_t](#) type, int \*offset, int reslimit, globus\_list\_t \*\*str2\_list)
- globus\_result\_t [globus\\_uls\\_client\\_lrc\\_mapping\\_exists](#) (globus\_uls\_handle\_t \*h, char \*lfn, char \*pfn)
- globus\_result\_t [globus\\_uls\\_client\\_lrc\\_renamelfn](#) (globus\_uls\_handle\_t \*h, char \*oldname, char \*newname)
- globus\_result\_t [globus\\_uls\\_client\\_lrc\\_renamelfn\\_bulk](#) (globus\_uls\_handle\_t \*h, globus\_list\_t \*str2\_list, globus\_list\_t \*\*str2bulk\_list)
- globus\_result\_t [globus\\_uls\\_client\\_lrc\\_renamepfn](#) (globus\_uls\_handle\_t \*h, char \*oldname, char \*newname)
- globus\_result\_t [globus\\_uls\\_client\\_lrc\\_renamepfn\\_bulk](#) (globus\_uls\_handle\_t \*h, globus\_list\_t \*str2\_list, globus\_list\_t \*\*str2bulk\_list)
- globus\_result\_t [globus\\_uls\\_client\\_lrc\\_rli\\_add](#) (globus\_uls\_handle\_t \*h, char \*rli\_url, int flags, char \*pattern)
- globus\_result\_t [globus\\_uls\\_client\\_lrc\\_rli\\_delete](#) (globus\_uls\_handle\_t \*h, char \*rli\_url, char \*pattern)
- globus\_result\_t [globus\\_uls\\_client\\_lrc\\_rli\\_get\\_part](#) (globus\_uls\_handle\_t \*h, char \*rli\_url, char \*pattern, globus\_list\_t \*\*str2\_list)
- globus\_result\_t [globus\\_uls\\_client\\_lrc\\_rli\\_info](#) (globus\_uls\_handle\_t \*h, char \*rli\_url, [globus\\_uls\\_rli\\_info\\_t](#) \*info)
- globus\_result\_t [globus\\_uls\\_client\\_lrc\\_rli\\_list](#) (globus\_uls\_handle\_t \*h, globus\_list\_t \*\*rliinfo\_list)

#### 4.6.1 Detailed Description

Functions to view and update data managed by a LRC server.

#### 4.6.2 Define Documentation

##### 4.6.2.1 #define FRLI\_BLOOMFILTER 0x1

Update RLI using bloom filters (see [globus\\_uls\\_client\\_lrc\\_rli\\_add\(\)](#)).

##### 4.6.2.2 #define MAXURL 256

Maximum length of URL string.

#### 4.6.3 Function Documentation

##### 4.6.3.1 globus\_result\_t globus\_uls\_client\_lrc\_attr\_add (globus\_uls\_handle\_t \*h, char \*key, globus\_uls\_attribute\_t \*attr)

Add an attribute to an object in the LRC database.

##### Parameters:

*h* Handle connected to an RLS server.

*key* Logical or Physical File Name (LFN or PFN) that identifies object attribute should be added to.

*attr* Attribute to be added to object. [name](#), [objtype](#), [type](#) and [val](#) should be set in *attr*.

##### Return values:

**GLOBUS\_SUCCESS** Attribute successfully associated with object.

#### 4.6.3.2 `globus_result_t globus_qls_client_qls_attr_add_bulk (globus_qls_handle_t * h, globus_list_t * attr_obj_list, globus_list_t ** str2bulk_list)`

Bulk add attributes to objects in the LRC database.

##### Parameters:

*h* Handle connected to an LRS server.

*attr\_obj\_list* List of object names (LFN or PFN) and attributes to be added. Each list datum should be of type [globus\\_qls\\_attribute\\_object\\_t](#).

*str2bulk\_list* List of failed updates. Each list datum is a [globus\\_qls\\_string2\\_bulk\\_t](#) structure. **str2.s1** will be the object name, **str2.s2** the attribute name, and **rc** will be the result code from the failed update. Only failed updates will be returned.

#### 4.6.3.3 `globus_result_t globus_qls_client_qls_attr_create (globus_qls_handle_t * h, char * name, globus_qls_obj_type_t objtype, globus_qls_attr_type_t type)`

Define new attribute in LRC database.

##### Parameters:

*h* Handle connected to an LRC server.

*name* Name of attribute.

*objtype* Object (LFN or PFN) type that attribute applies to.

*type* Type of attribute value.

##### Return values:

**GLOBUS\_SUCCESS** Attribute successfully created.

#### 4.6.3.4 `globus_result_t globus_qls_client_qls_attr_delete (globus_qls_handle_t * h, char * name, globus_qls_obj_type_t objtype, globus_bool_t clearvalues)`

Undefine attribute in LRC database, previously created with [globus\\_qls\\_client\\_qls\\_attr\\_create\(\)](#).

##### Parameters:

*h* Handle connected to an LRC server.

*name* Name of attribute.

*objtype* Object (LFN or PFN) type that attribute applies to.

*clearvalues* If GLOBUS\_TRUE then any any values for this attribute are first removed from the objects they're associated with. If GLOBUS\_FALSE and any values exist then [GLOBUS\\_QLS\\_ATTR\\_EXIST](#) is returned.

##### Return values:

**GLOBUS\_SUCCESS** Attribute successfully removed.

#### 4.6.3.5 `globus_result_t globus_qls_client_qls_attr_get (globus_qls_handle_t * h, char * name, globus_qls_obj_type_t objtype, globus_list_t ** attr_list)`

Return definitions of attributes in LRC database.

**Parameters:**

- h* Handle connected to an RLS server.
- name* Name of attribute. If name is NULL all attributes of the specified *objtype* are returned.
- objtype* Object (LFN or PFN) type that attribute applies to.
- attr\_list* Any attribute definitions found will be returned as a list of [globus\\_uls\\_attribute\\_t](#) structures.

**Return values:**

- GLOBAL\_SUCCESS** Attribute definitions successfully retrieved. *attr\_list* should be freed with [globus\\_uls\\_client\\_free\\_list\(\)](#) when it is no longer needed.

**4.6.3.6 globus\_result\_t globus\_uls\_client\_lrc\_attr\_modify (globus\_uls\_handle\_t \* *h*, char \* *key*, globus\_uls\_attribute\_t \* *attr*)**

Modify an attribute value.

**Parameters:**

- h* Handle connected to an RLS server.
- key* Name of object (LFN or PFN).
- attr* Attribute to be modified. The [objtype](#), [name](#) and [type](#) fields should be set in *attr* to identify the attribute, the [val](#) field should be the new value.

**Return values:**

- GLOBAL\_SUCCESS** Attribute successfully modified.

**4.6.3.7 globus\_result\_t globus\_uls\_client\_lrc\_attr\_remove (globus\_uls\_handle\_t \* *h*, char \* *key*, globus\_uls\_attribute\_t \* *attr*)**

Remove an attribute from an object (LFN or PFN) in the LRC database.

**Parameters:**

- h* Handle connected to an RLS server.
- key* Name of object (LFN or PFN).
- attr* Attribute to be removed. The [objtype](#) and [name](#) fields should be set in *attr* to identify the attribute.

**Return values:**

- GLOBAL\_SUCCESS** Attribute successfully removed.

**4.6.3.8 globus\_result\_t globus\_uls\_client\_lrc\_attr\_remove\_bulk (globus\_uls\_handle\_t \* *h*, globus\_list\_t \* *attr\_obj\_list*, globus\_list\_t \*\* *str2bulk\_list*)**

Bulk remove attributes from objects in the LRC database.

**Parameters:**

- h* Handle connected to an RLS server.
- attr\_obj\_list* List of object names (LFN or PFN) and attributes to be removed. It is not necessary to set the attribute type or value. Each list datum should be of type [globus\\_uls\\_attribute\\_object\\_t](#).
- str2bulk\_list* List of failed updates. Each list datum is a [globus\\_uls\\_string2\\_bulk\\_t](#) structure. **str2.s1** will be the object name, **str2.s2** the attribute name, and **rc** will be the result code from the failed update. Only failed updates will be returned.

**4.6.3.9 globus\_result\_t globus\_rls\_client\_lrc\_attr\_search (globus\_rls\_handle\_t \* *h*, char \* *name*, globus\_rls\_obj\_type\_t *objtype*, globus\_rls\_attr\_op\_t *op*, globus\_rls\_attribute\_t \* *operand1*, globus\_rls\_attribute\_t \* *operand2*, int \* *offset*, int *reslimit*, globus\_list\_t \*\* *attr\_obj\_list*)**

Search for objects (LFNs or PFNs) in a LRC database that have the specified attribute whose value matches a boolean expression.

**Parameters:**

*h* Handle connected to an RLS server.

*name* Name of attribute.

*objtype* Object (LFN or PFN) type that attribute applies to.

*op* Operator to be used in searching for values.

*operand1* First operand in boolean expression. [type](#) and [val](#) should be set in [globus\\_rls\\_attribute\\_t](#).

*operand2* Second operand in boolean expression, only used when *op* is `globus_rls_client_attr_op_btw`. [type](#) and [val](#) should be set in [globus\\_rls\\_attribute\\_t](#).

*offset* Offset into result list. Used in conjunction with *reslimit* to retrieve results a few at a time. Use 0 to begin with first result. If NULL then API will handle accumulating partial results transparently.

*reslimit* Maximum number of results to return. Used in conjunction with *offset* to retrieve results a few at a time. Use 0 to retrieve all results.

*attr\_obj\_list* Any objects with the specified attribute will be returned, with the attribute value, in a list of [globus\\_rls\\_attribute\\_object\\_t](#) structures.

**Return values:**

**GLOBAL\_SUCCESS** Objects with specified attribute returned in *attr\_obj\_list*. *attr\_obj\_list* should be freed with [globus\\_rls\\_client\\_free\\_list\(\)](#) when it is no longer needed. See [Query Results](#).

**4.6.3.10 globus\_result\_t globus\_rls\_client\_lrc\_attr\_value\_get (globus\_rls\_handle\_t \* *h*, char \* *key*, char \* *name*, globus\_rls\_obj\_type\_t *objtype*, globus\_list\_t \*\* *attr\_list*)**

Return attributes in LRC database for specified object (LFN or PFN).

**Parameters:**

*h* Handle connected to an RLS server.

*key* Logical or Physical File Name (LFN or PFN) that identifies object attributes should be retrieved for.

*name* Name of attribute to retrieve. If NULL all attributes for *key*, *objtype* are returned.

*objtype* Object (LFN or PFN) type that attribute applies to.

*attr\_list* Any attributes found will be returned in this list of [globus\\_rls\\_attribute\\_t](#) structures.

**Return values:**

**GLOBAL\_SUCCESS** Attributes successfully retrieved. *attr\_list* should be freed with [globus\\_rls\\_client\\_free\\_list\(\)](#) when it is no longer needed.

**4.6.3.11 globus\_result\_t globus\_rls\_client\_lrc\_attr\_value\_get\_bulk (globus\_rls\_handle\_t \* *h*, globus\_list\_t \* *keylist*, char \* *name*, globus\_rls\_obj\_type\_t *objtype*, globus\_list\_t \*\* *attr\_obj\_list*)**

Return attributes in LRC database for specified objects (LFN or PFN).

**Parameters:**

*h* Handle connected to an RLS server.

**keylist** Logical or Physical File Names (LFNs or PFNs) that identify object attributes should be retrieved for. Each list datum should be a string containing the LFN or PFN.

**name** Name of attribute to retrieve. If NULL all attributes for *key*, *objtype* are returned.

**objtype** Object (LFN or PFN) type that attribute applies to.

**attr\_obj\_list** Any attributes found will be returned in this list of [globus\\_rls\\_attribute\\_object\\_t](#) structures.

**Return values:**

**GLOBUS\_SUCCESS** Attributes successfully retrieved. *attr\_obj\_list* should be freed with [globus\\_rls\\_client\\_free\\_list\(\)](#) when it is no longer needed.

#### 4.6.3.12 **globus\_result\_t globus\_rls\_client\_lrc\_add (globus\_rls\_handle\_t \* *h*, char \* *lfn*, char \* *pfn*)**

Add mapping to PFN to an existing LFN.

**Parameters:**

***h*** Handle connected to an RLS server.

***lfn*** LFN to add *pfn* mapping to, should already exist.

***pfn*** PFN that *lfn* should map to.

**Return values:**

**GLOBUS\_SUCCESS** New mapping created.

#### 4.6.3.13 **globus\_result\_t globus\_rls\_client\_lrc\_add\_bulk (globus\_rls\_handle\_t \* *h*, globus\_list\_t \* *str2\_list*, globus\_list\_t \*\* *str2bulk\_list*)**

Bulk add LFN,PFN mappings in LRC database.

LFNs must already exist.

**Parameters:**

***h*** Handle connected to an RLS server.

***str2\_list*** LFN,PFN pairs to add mappings.

***str2bulk\_list*** List of failed updates. Each list datum is a [globus\\_rls\\_string2\\_bulk\\_t](#) structure. **str2.s1** will be the LFN, and **str2.s2** the PFN it maps to, and **rc** will be the result code from the failed update. Only failed updates will be returned.

#### 4.6.3.14 **globus\_result\_t globus\_rls\_client\_lrc\_clear (globus\_rls\_handle\_t \* *h*)**

Clear all mappings from LRC database.

User needs both ADMIN and LRCUPDATE privileges to perform this operation. Note that if the LRC is cleared this will not be reflected in any RLI servers updated by the LRC until the next softstate update, even if immediate updates are enabled.

**Parameters:**

***h*** Handle connected to an RLS server.

**Return values:**

**GLOBUS\_SUCCESS** Mappings cleared.

#### 4.6.3.15 `globus_result_t globus_qls_client_create (globus_qls_handle_t * h, char * lfn, char * pfn)`

Create mapping between a LFN and PFN.

LFN should not exist yet.

##### Parameters:

*h* Handle connected to an RLS server.

*lfn* LFN to add *pfn* mapping to, should not already exist.

*pfn* PFN that *lfn* should map to.

##### Return values:

**GLOBAL\_SUCCESS** New mapping created.

#### 4.6.3.16 `globus_result_t globus_qls_client_create_bulk (globus_qls_handle_t * h, globus_list_t * str2_list, globus_list_t ** str2bulk_list)`

Bulk create LFN,PFN mappings in LRC database.

##### Parameters:

*h* Handle connected to an RLS server.

*str2\_list* LFN,PFN pairs to create mappings for.

*str2bulk\_list* List of failed updates. Each list datum is a `globus_qls_string2_bulk_t` structure. **str2.s1** will be the LFN, and **str2.s2** the PFN it maps to, and **rc** will be the result code from the failed update. Only failed updates will be returned.

#### 4.6.3.17 `globus_result_t globus_qls_client_delete (globus_qls_handle_t * h, char * lfn, char * pfn)`

Delete mapping between LFN and PFN.

##### Parameters:

*h* Handle connected to an RLS server.

*lfn* LFN to remove mapping from.

*pfn* PFN that *lfn* maps to that is being removed.

##### Return values:

**GLOBAL\_SUCCESS** Mapping removed.

#### 4.6.3.18 `globus_result_t globus_qls_client_delete_bulk (globus_qls_handle_t * h, globus_list_t * str2_list, globus_list_t ** str2bulk_list)`

Bulk delete LFN,PFN mappings in LRC database.

##### Parameters:

*h* Handle connected to an RLS server.

*str2\_list* LFN,PFN pairs to add mappings.

*str2bulk\_list* List of failed updates. Each list datum is a `globus_qls_string2_bulk_t` structure. **str2.s1** will be the LFN, and **str2.s2** the PFN it maps to, and **rc** will be the result code from the failed update. Only failed updates will be returned.

#### 4.6.3.19 `globus_result_t globus_uls_client_lrc_exists (globus_uls_handle_t * h, char * key, globus_uls_obj_type_t objtype)`

Check if an object exists in the LRC database.

##### Parameters:

*h* Handle connected to an RLS server.

*key* LFN or PFN that identifies object.

*objtype* Type of object *key* refers to ([globus\\_uls\\_obj\\_lrc\\_lfn](#) or [globus\\_uls\\_obj\\_lrc\\_pfn](#)).

##### Return values:

**GLOBUS\_SUCCESS** Object exists.

#### 4.6.3.20 `globus_result_t globus_uls_client_lrc_exists_bulk (globus_uls_handle_t * h, globus_list_t * keylist, globus_uls_obj_type_t objtype, globus_list_t ** str2bulk_list)`

Bulk check if objects exist in the LRC database.

##### Parameters:

*h* Handle connected to an RLS server.

*keylist* LFNs or PFNs that identify objects.

*objtype* Type of object *key* refers to ([globus\\_uls\\_obj\\_lrc\\_lfn](#) or [globus\\_uls\\_obj\\_lrc\\_pfn](#)).

*str2bulk\_list* Results of existence check. Each list datum will be a [globus\\_uls\\_string2\\_bulk\\_t](#) structure. *str2.s1* will be the LFN or PFN, and *str2.s2* empty, and *rc* will be the result code indicating existence.

#### 4.6.3.21 `globus_result_t globus_uls_client_lrc_get_lfn (globus_uls_handle_t * h, char * pfn, int * offset, int reslimit, globus_list_t ** str2_list)`

Return LFNs mapped to PFN in the LRC database.

##### Parameters:

*h* Handle connected to an RLS server.

*pfn* PFN to search for.

*offset* Offset into result list. Used in conjunction with *reslimit* to retrieve results a few at a time. Use 0 to begin with first result. If NULL then API will handle accumulating partial results transparently.

*reslimit* Maximum number of results to return. Used in conjunction with *offset* to retrieve results a few at a time. Use 0 to retrieve all results.

*str2\_list* List of LFNs that map to *pfn*. Each list datum will be a [globus\\_uls\\_string2\\_t](#) structure. *s1* will be the LFN, and *s2* the PFN it maps to.

##### Return values:

**GLOBUS\_SUCCESS** List of LFNs that map to *pfn* in *str2\_list*. See [Query Results](#).

#### 4.6.3.22 `globus_result_t globus_uls_client_lrc_get_lfn_bulk (globus_uls_handle_t * h, globus_list_t * pfn_list, globus_list_t ** str2bulk_list)`

Bulk return LFNs mapped to PFN in the LRC database.

##### Parameters:

*h* Handle connected to an RLS server.

*pfnlist* PFNs to search for.

*str2bulk\_list* Results of queries. Each list datum will be a `globus_uls_string2_bulk_t` structure. *str2.s1* will be the LFN, and *str2.s2* the PFN it maps to, and *rc* will be the result code from the query.

#### 4.6.3.23 `globus_result_t globus_uls_client_lrc_get_lfn_wc (globus_uls_handle_t * h, char * pfn_pattern, globus_uls_pattern_t type, int * offset, int reslimit, globus_list_t ** str2_list)`

Return LFNs mapped to wildcarded PFN in the LRC database.

##### Parameters:

*h* Handle connected to an RLS server.

*pfn\_pattern* PFN pattern to search for.

*type* Identifies wildcard characters used in *pfn\_pattern*. Wildcard chars can be Unix file globbing chars (\* matches 0 or more characters, ? matches any single character) or SQL "like" wildcard characters (% matches 0 or more characters, \_ matches any single character).

*offset* Offset into result list. Used in conjunction with *reslimit* to retrieve results a few at a time. Use 0 to begin with first result. If NULL then the API will handle accumulating partial results transparently.

*reslimit* Maximum number of results to return. Used in conjunction with *offset* to retrieve results a few at a time. Use 0 to retrieve all results.

*str2\_list* List of LFNs that map to *pfn\_pattern*. Each list datum will be a `globus_uls_string2_t` structure. *s1* will be the LFN, and *s2* the PFN it maps to.

##### Return values:

**GLOBAL\_SUCCESS** List of LFNs that map to *pfn\_pattern* in *str2\_list*. See [Query Results](#).

#### 4.6.3.24 `globus_result_t globus_uls_client_lrc_get_pfn (globus_uls_handle_t * h, char * lfn, int * offset, int reslimit, globus_list_t ** str2_list)`

Return PFNs mapped to LFN in the LRC database.

##### Parameters:

*h* Handle connected to an RLS server.

*lfn* LFN to search for.

*offset* Offset into result list. Used in conjunction with *reslimit* to retrieve results a few at a time. Use 0 to begin with first result.

*reslimit* Maximum number of results to return. Used in conjunction with *offset* to retrieve results a few at a time. Use 0 to retrieve all results.

*str2\_list* List of PFNs that map to *lfn*. Each list datum will be a `globus_uls_string2_t` structure. *s1* will be the LFN, and *s2* the PFN it maps to.

##### Return values:

**GLOBAL\_SUCCESS** List of PFNs that map to *lfn* in *str2\_list*.

**4.6.3.25 globus\_result\_t globus\_uls\_client\_lrc\_get\_pfn\_bulk (globus\_uls\_handle\_t \* *h*, globus\_list\_t \* *lfn-list*, globus\_list\_t \*\* *str2bulk\_list*)**

Bulk return PFNs mapped to LFN in the LRC database.

**Parameters:**

*h* Handle connected to an RLS server.

*lfnlist* LFNs to search for.

*str2bulk\_list* Results of queries. Each list datum will be a [globus\\_uls\\_string2\\_bulk\\_t](#) structure. **str2.s1** will be the LFN, and **str2.s2** the PFN it maps to, and **rc** will be the result code from the query.

**4.6.3.26 globus\_result\_t globus\_uls\_client\_lrc\_get\_pfn\_wc (globus\_uls\_handle\_t \* *h*, char \* *lfn\_pattern*, globus\_uls\_pattern\_t *type*, int \* *offset*, int *reslimit*, globus\_list\_t \*\* *str2\_list*)**

Return PFNs mapped to wildcarded LFN in the LRC database.

**Parameters:**

*h* Handle connected to an RLS server.

*lfn\_pattern* LFN pattern to search for.

*type* Identifies wildcard characters used in *lfn\_pattern*. Wildcard chars can be Unix file globbing chars (\* matches 0 or more characters, ? matches any single character) or SQL "like" wildcard characters (% matches 0 or more characters, \_ matches any single character).

*offset* Offset into result list. Used in conjunction with *reslimit* to retrieve results a few at a time. Use 0 to begin with first result.

*reslimit* Maximum number of results to return. Used in conjunction with *offset* to retrieve results a few at a time. Use 0 to retrieve all results.

*str2\_list* List of PFNs that map to *lfn\_pattern*. Each list datum will be a [globus\\_uls\\_string2\\_t](#) structure. **s1** will be the LFN, and **s2** the PFN it maps to.

**Return values:**

**GLOBUS\_SUCCESS** List of PFNs that map to *lfn\_pattern* in *str2\_list*. See [Query Results](#).

**4.6.3.27 globus\_result\_t globus\_uls\_client\_lrc\_mapping\_exists (globus\_uls\_handle\_t \* *h*, char \* *lfn*, char \* *pfn*)**

Check if a mapping exists in the LRC database.

**Parameters:**

*h* Handle connected to an RLS server.

*lfn* LFN of mapping.

*pfn* PFN of mapping.

**Return values:**

**GLOBUS\_SUCCESS** Object exists.

**4.6.3.28 globus\_result\_t globus\_qls\_client\_lrc\_renamelfn (globus\_qls\_handle\_t \* *h*, char \* *oldname*, char \* *newname*)**

Rename LFN.

If immediate mode is ON, the LRC will send update messages to associated RLIs.

**Parameters:**

- h* Handle connected to an RLS server.
- oldname* Existing LFN name, to be renamed.
- newname* New LFN name, to replace existing name.

**Return values:**

**GLOBUS\_SUCCESS** LFN renamed.

**4.6.3.29 globus\_result\_t globus\_qls\_client\_lrc\_renamelfn\_bulk (globus\_qls\_handle\_t \* *h*, globus\_list\_t \* *str2\_list*, globus\_list\_t \*\* *str2bulk\_list*)**

Bulk rename LFN names in LRC database.

LFNs must already exist. If immediate mode is ON, the LRC will send update messages to associated RLIs.

**Parameters:**

- h* Handle connected to an RLS server.
- str2\_list* oldname,newname pairs such that newname replaces oldname for LFNs.
- str2bulk\_list* List of failed updates. Each list datum is a [globus\\_qls\\_string2\\_bulk\\_t](#) structure. **str2.s1** will be the old LFN name, and **str2.s2** the new LFN name, and **rc** will be the result code from the failed update. Only failed updates will be returned.

**4.6.3.30 globus\_result\_t globus\_qls\_client\_lrc\_renamepfm (globus\_qls\_handle\_t \* *h*, char \* *oldname*, char \* *newname*)**

Rename PFN.

**Parameters:**

- h* Handle connected to an RLS server.
- oldname* Existing PFN name, to be renamed.
- newname* New PFN name, to replace existing name.

**Return values:**

**GLOBUS\_SUCCESS** PFN renamed.

**4.6.3.31 globus\_result\_t globus\_qls\_client\_lrc\_renamepfm\_bulk (globus\_qls\_handle\_t \* *h*, globus\_list\_t \* *str2\_list*, globus\_list\_t \*\* *str2bulk\_list*)**

Bulk rename PFN names in LRC database.

PFNs must already exist.

**Parameters:**

- h* Handle connected to an RLS server.

*str2\_list* oldname,newname pairs such that newname replaces oldname for PFNs.

*str2bulk\_list* List of failed updates. Each list datum is a [globus\\_rls\\_string2\\_bulk\\_t](#) structure. **str2.s1** will be the old PFN name, and **str2.s2** the new PFN name, and **rc** will be the result code from the failed update. Only failed updates will be returned.

#### 4.6.3.32 **globus\_result\_t globus\_rls\_client\_lrc\_rli\_add (globus\_rls\_handle\_t \* *h*, char \* *rli\_url*, int *flags*, char \* *pattern*)**

LRC servers send information about LFNs in their database to the the list of RLI servers in the database, added with the following function.

Updates may be partitioned amongst multiple RLIs by specifying one or more patterns for an RLI.

##### **Parameters:**

*h* Handle connected to an RLS server.

*rli\_url* URL of RLI server that LRC should send updates to.

*flags* Should be zero or [FRLI\\_BLOOMFILTER](#).

*pattern* If not NULL used to filter which LFNs are sent to *rli\_url*. Standard Unix wildcard characters (\*, ?) may be used to do wildcard matches.

##### **Return values:**

**GLOBUS\_SUCCESS** RLI (with pattern if not NULL) added to LRC database.

#### 4.6.3.33 **globus\_result\_t globus\_rls\_client\_lrc\_rli\_delete (globus\_rls\_handle\_t \* *h*, char \* *rli\_url*, char \* *pattern*)**

Delete an entry from the LRC rli/partition tables.

##### **Parameters:**

*h* Handle connected to an RLS server.

*rli\_url* URL of RLI server to remove from LRC partition table.

*pattern* If not NULL then only the specific *rli\_url/pattern* is removed, else all partition information for *rli\_url* is removed.

##### **Return values:**

**GLOBUS\_SUCCESS** RLI and pattern (if specified) removed from LRC partition table.

#### 4.6.3.34 **globus\_result\_t globus\_rls\_client\_lrc\_rli\_get\_part (globus\_rls\_handle\_t \* *h*, char \* *rli\_url*, char \* *pattern*, globus\_list\_t \*\* *str2\_list*)**

Get RLI update partitions from LRC server.

##### **Parameters:**

*h* Handle connected to an RLS server.

*rli\_url* If not NULL identifies RLI that partition data will be retrieved for. If NULL then all RLIs are retrieved.

*pattern* If not NULL returns only partitions with matching patterns, otherwise all patterns are retrieved.

*str2\_list* Results added to list. Datums in *str2\_list* are of type [globus\\_rls\\_string2\\_t](#) structure. **s1** will be the rli url, **s2** an empty string or the pattern used to partition updates. See [Query Results](#).

**Return values:**

**GLOBUS\_SUCCESS** Partition data retrieved from server, written to *str2\_list*.

**4.6.3.35** [globus\\_result\\_t](#) [globus\\_rls\\_client\\_lrc\\_rli\\_info](#) ([globus\\_rls\\_handle\\_t](#) \* *h*, [char](#) \* *rli\_url*, [globus\\_rls\\_rli\\_info\\_t](#) \* *info*)

Get info about RLI server updated by an LRC server.

**Parameters:**

- h* Handle connected to an RLS server.
- rli\_url* URL of RLI server to retrieve info for.
- info* Data about RLI server will be written here.

**Return values:**

**GLOBUS\_SUCCESS** Info about RLI server successfully retrieved.

**4.6.3.36** [globus\\_result\\_t](#) [globus\\_rls\\_client\\_lrc\\_rli\\_list](#) ([globus\\_rls\\_handle\\_t](#) \* *h*, [globus\\_list\\_t](#) \*\* *rliinfo\_list*)

Return URLs of RLIs that LRC sends updates to.

**Parameters:**

- h* Handle connected to an RLS server.
- rliinfo\_list* List of RLIs updated by this LRC returned in this list. Each list datum is of type [globus\\_rls\\_rli\\_info\\_t](#). *rliinfo\_list* should be freed with [globus\\_rls\\_client\\_free\\_list\(\)](#) when no longer needed.

**Return values:**

**GLOBUS\_SUCCESS** List of RLIs updated by this LRC returned in *rliinfo\_list*.

## 4.7 RLI Operations

Functions to view and update data managed by a RLI server.

### Data Structures

- struct [globus\\_rls\\_sender\\_info\\_t](#)  
Information about server sending updates to an rli, returned by [globus\\_rls\\_client\\_rli\\_sender\\_list\(\)](#).

### Functions

- [globus\\_result\\_t](#) [globus\\_rls\\_client\\_rli\\_exists](#) ([globus\\_rls\\_handle\\_t](#) \**h*, [char](#) \**key*, [globus\\_rls\\_obj\\_type\\_t](#) *objtype*)
- [globus\\_result\\_t](#) [globus\\_rls\\_client\\_rli\\_exists\\_bulk](#) ([globus\\_rls\\_handle\\_t](#) \**h*, [globus\\_list\\_t](#) \**keylist*, [globus\\_rls\\_obj\\_type\\_t](#) *objtype*, [globus\\_list\\_t](#) \*\**str2bulk\_list*)

- globus\_result\_t [globus\\_rls\\_client\\_rli\\_get\\_lrc](#) (globus\_rls\_handle\_t \*h, char \*lfn, int \*offset, int reslimit, globus\_list\_t \*\*str2\_list)
- globus\_result\_t [globus\\_rls\\_client\\_rli\\_get\\_lrc\\_bulk](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*lfnlist, globus\_list\_t \*\*str2bulk\_list)
- globus\_result\_t [globus\\_rls\\_client\\_rli\\_get\\_lrc\\_wc](#) (globus\_rls\_handle\_t \*h, char \*lfn\_pattern, [globus\\_rls\\_pattern\\_t](#) type, int \*offset, int reslimit, globus\_list\_t \*\*str2\_list)
- globus\_result\_t [globus\\_rls\\_client\\_rli\\_sender\\_list](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*\*senderinfo\_list)
- globus\_result\_t [globus\\_rls\\_client\\_rli\\_lrc\\_list](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*\*lrcinfo\_list)
- globus\_result\_t [globus\\_rls\\_client\\_rli\\_mapping\\_exists](#) (globus\_rls\_handle\_t \*h, char \*lfn, char \*lrc)
- globus\_result\_t [globus\\_rls\\_client\\_rli\\_rli\\_add](#) (globus\_rls\_handle\_t \*h, char \*rli\_url, char \*pattern)
- globus\_result\_t [globus\\_rls\\_client\\_rli\\_rli\\_delete](#) (globus\_rls\_handle\_t \*h, char \*rli\_url, char \*pattern)
- globus\_result\_t [globus\\_rls\\_client\\_rli\\_rli\\_get\\_part](#) (globus\_rls\_handle\_t \*h, char \*rli\_url, char \*pattern, globus\_list\_t \*\*str2\_list)
- globus\_result\_t [globus\\_rls\\_client\\_rli\\_rli\\_list](#) (globus\_rls\_handle\_t \*h, globus\_list\_t \*\*rliinfo\_list)

#### 4.7.1 Detailed Description

Functions to view and update data managed by a RLI server.

#### 4.7.2 Function Documentation

##### 4.7.2.1 globus\_result\_t globus\_rls\_client\_rli\_exists (globus\_rls\_handle\_t \*h, char \*key, globus\_rls\_obj\_type\_t objtype)

Check if an object exists in the RLI database.

##### Parameters:

*h* Handle connected to an RLS server.

*key* LFN or LRC that identifies object.

*objtype* Type of object *key* refers to ([globus\\_rls\\_obj\\_rli\\_lfn](#) or [globus\\_rls\\_obj\\_rli\\_lrc](#)).

##### Return values:

**GLOBUS\_SUCCESS** Object exists.

##### 4.7.2.2 globus\_result\_t globus\_rls\_client\_rli\_exists\_bulk (globus\_rls\_handle\_t \*h, globus\_list\_t \*keylist, globus\_rls\_obj\_type\_t objtype, globus\_list\_t \*\*str2bulk\_list)

Bulk check if objects exist in the RLI database.

##### Parameters:

*h* Handle connected to an RLS server.

*keylist* LFNs or LRCs that identify objects.

*objtype* Type of object *key* refers to ([globus\\_rls\\_obj\\_rli\\_lfn](#) or [globus\\_rls\\_obj\\_rli\\_lrc](#)).

*str2bulk\_list* Results of existence check. Each list datum will be a [globus\\_rls\\_string2\\_bulk\\_t](#) structure. *str2.s1* will be the LFN or LRC, and *str2.s2* empty, and *rc* will be the result code indicating existence.

#### 4.7.2.3 `globus_result_t globus_rls_client_rli_get_lrc (globus_rls_handle_t * h, char * lfn, int * offset, int reslimit, globus_list_t ** str2_list)`

Return LRCs mapped to LFN in the RLI database.

##### Parameters:

*h* Handle connected to an RLS server.

*lfn* LFN whose list of LRCs is desired.

*offset* Offset into result list. Used in conjunction with *reslimit* to retrieve results a few at a time. Use 0 to begin with first result.

*reslimit* Maximum number of results to return. Used in conjunction with *offset* to retrieve results a few at a time. Use 0 to retrieve all results.

*str2\_list* List of LRCs that *lfn* maps to. Each list datum will be a `globus_rls_string2_t` structure. *s1* will be the LFN, and *s2* the LRC it maps to. *str2\_list* should be freed with `globus_rls_client_free_list()`.

##### Return values:

**GLOBUS\_SUCCESS** List of LRCs that map to *lfn* in *str2\_list*. See [Query Results](#).

#### 4.7.2.4 `globus_result_t globus_rls_client_rli_get_lrc_bulk (globus_rls_handle_t * h, globus_list_t * lfnlist, globus_list_t ** str2bulk_list)`

Bulk return LRCs mapped to LFN in the RLI database.

##### Parameters:

*h* Handle connected to an RLS server.

*lfnlist* LFNs to search for.

*str2bulk\_list* Results of queries. Each list datum will be a `globus_rls_string2_bulk_t` structure. *str2.s1* will be the LFN, and *str2.s2* the LRC it maps to, and *rc* will be the result code from the query.

#### 4.7.2.5 `globus_result_t globus_rls_client_rli_get_lrc_wc (globus_rls_handle_t * h, char * lfn_pattern, globus_rls_pattern_t type, int * offset, int reslimit, globus_list_t ** str2_list)`

Return LRCs mapped to wildcarded LFN in the RLI database.

##### Parameters:

*h* Handle connected to an RLS server.

*lfn\_pattern* LFN pattern to search for.

*type* Identifies wildcard characters used in *lfn\_pattern*. Wildcard chars can be Unix file globbing chars (\* matches 0 or more characters, ? matches any single character) or SQL "like" wildcard characters (% matches 0 or more characters, \_ matches any single character).

*offset* Offset into result list. Used in conjunction with *reslimit* to retrieve results a few at a time. Use 0 to begin with first result.

*reslimit* Maximum number of results to return. Used in conjunction with *offset* to retrieve results a few at a time. Use 0 to retrieve all results.

*str2\_list* List of LRCs that map to *lfn\_pattern*. Each list datum will be a `globus_rls_string2_t`. *s1* will be the LFN, and *s2* the LRC it maps to. *str2\_list* should be freed with `globus_rls_client_free_list()`.

##### Return values:

**GLOBUS\_SUCCESS** List of LRCs that map to *lfn\_pattern* in *str2\_list*. See [Query Results](#).

#### 4.7.2.6 `globus_result_t globus_rls_client_rli_sender_list (globus_rls_handle_t * h, globus_list_t ** senderinfo_list)`

Get list of servers updating this RLI server.

Similar to `globus_rls_client_rli_get_part()` except no partition information is returned.

##### Parameters:

*h* Handle connected to an RLS server.

*senderinfo\_list* Datums in *senderinfo\_list* will be of type `globus_rls_sender_info_t`. *senderinfo\_list* should be freed with `globus_rls_client_free_list()`.

##### Return values:

**GLOBUS\_SUCCESS** List of LRCs updating RLI added to *senderinfo\_list*.

#### 4.7.2.7 `globus_result_t globus_rls_client_rli_lrc_list (globus_rls_handle_t * h, globus_list_t ** lrcinfo_list)`

Deprecated, use `globus_rls_client_rli_sender_list()`.

##### Parameters:

*h* Handle connected to an RLS server.

*lrcinfo\_list* Datums in *lrcinfo\_list* will be of type `globus_rls_lrc_info_t`. *lrcinfo\_list* should be freed with `globus_rls_client_free_list()`.

##### Return values:

**GLOBUS\_SUCCESS** List of LRCs updating RLI added to *lrcinfo\_list*.

#### 4.7.2.8 `globus_result_t globus_rls_client_rli_mapping_exists (globus_rls_handle_t * h, char * lfn, char * lrc)`

Check if a mapping exists in the RLI database.

##### Parameters:

*h* Handle connected to an RLS server.

*lfn* LFN of mapping.

*lrc* LRC of mapping.

##### Return values:

**GLOBUS\_SUCCESS** Mapping exists.

#### 4.7.2.9 `globus_result_t globus_rls_client_rli_rli_add (globus_rls_handle_t * h, char * rli_url, char * pattern)`

RLI servers send information about LFNs in their database to the the list of RLI servers in the database, added with the following function.

Updates may be partitioned amongst multiple RLIs by specifying one or more patterns for an RLI.

**Parameters:**

*h* Handle connected to an RLS server.

*rli\_url* URL of RLI server that LRC should send updates to.

*pattern* If not NULL used to filter which LFNs are sent to *rli\_url*. Standard Unix wildcard characters (\*, ?) may be used to do wildcard matches.

**Return values:**

**GLOBUS\_SUCCESS** RLI (with pattern if not NULL) added to RLI database.

**4.7.2.10 globus\_result\_t globus\_rls\_client\_rli\_rli\_delete (globus\_rls\_handle\_t \* *h*, char \* *rli\_url*, char \* *pattern*)**

Delete an entry from the RLI rli/partition tables.

**Parameters:**

*h* Handle connected to an RLS server.

*rli\_url* URL of RLI server to remove from RLI partition table.

*pattern* If not NULL then only the specific *rli\_url/pattern* is removed, else all partition information for *rli\_url* is removed.

**Return values:**

**GLOBUS\_SUCCESS** RLI and pattern (if specified) removed from LRC partition table.

**4.7.2.11 globus\_result\_t globus\_rls\_client\_rli\_rli\_get\_part (globus\_rls\_handle\_t \* *h*, char \* *rli\_url*, char \* *pattern*, globus\_list\_t \*\* *str2\_list*)**

Get RLI update partitions from RLI server.

**Parameters:**

*h* Handle connected to an RLS server.

*rli\_url* If not NULL identifies RLI that partition data will be retrieved for. If NULL then all RLIs are retrieved.

*pattern* If not NULL returns only partitions with matching patterns, otherwise all patterns are retrieved.

*str2\_list* Results added to list. Datums in *str2\_list* are of type [globus\\_rls\\_string2\\_t](#) structure. *s1* will be the rli url, *s2* an empty string or the pattern used to partition updates. See [Query Results](#).

**Return values:**

**GLOBUS\_SUCCESS** Partition data retrieved from server, written to *str2\_list*.

**4.7.2.12 globus\_result\_t globus\_rls\_client\_rli\_rli\_list (globus\_rls\_handle\_t \* *h*, globus\_list\_t \*\* *rliinfo\_list*)**

Return URLs of RLIs that RLI sends updates to.

**Parameters:**

*h* Handle connected to an RLS server.

*rliinfo\_list* List of RLIs updated by this RLI returned in this list. Each list datum is of type [globus\\_rls\\_rli\\_info\\_t](#). *rliinfo\_list* should be freed with [globus\\_rls\\_client\\_free\\_list\(\)](#) when no longer needed.

**Return values:**

**GLOBUS\_SUCCESS** List of RLIs updated by this LRC returned in *rliinfo\_list*.

## 5 Data Structure Documentation

### 5.1 globus\_rls\_attribute\_object\_t Struct Reference

[globus\\_rls\\_client\\_lrc\\_attr\\_search\(\)](#) returns a list of these structures which include the object name (LFN or PFN) and attribute value found by the query.

#### Data Fields

- [globus\\_rls\\_attribute\\_t attr](#)
- char \* [key](#)
- int [rc](#)

#### 5.1.1 Detailed Description

[globus\\_rls\\_client\\_lrc\\_attr\\_search\(\)](#) returns a list of these structures which include the object name (LFN or PFN) and attribute value found by the query.

#### 5.1.2 Field Documentation

##### 5.1.2.1 globus\_rls\_attribute\_t globus\_rls\_attribute\_object\_t::attr

Attribute value.

##### 5.1.2.2 char\* globus\_rls\_attribute\_object\_t::key

LFN or PFN.

##### 5.1.2.3 int globus\_rls\_attribute\_object\_t::rc

Result code, only used in bulk query.

### 5.2 globus\_rls\_attribute\_t Struct Reference

Object (LFN or PFN) attribute type.

#### Data Fields

- char \* [name](#)
- [globus\\_rls\\_obj\\_type\\_t](#) objtype
- [globus\\_rls\\_attr\\_type\\_t](#) type
- time\_t [t](#)
- double [d](#)
- int [i](#)
- char \* [s](#)

#### 5.2.1 Detailed Description

Object (LFN or PFN) attribute type.

## 5.2.2 Field Documentation

### 5.2.2.1 `char* globus_rls_attribute_t::name`

Attribute name.

### 5.2.2.2 `globus_rls_obj_type_t globus_rls_attribute_t::objtype`

Object type.

### 5.2.2.3 `globus_rls_attr_type_t globus_rls_attribute_t::type`

Attribute value type.

### 5.2.2.4 `time_t globus_rls_attribute_t::t`

Date value (unix time).

### 5.2.2.5 `double globus_rls_attribute_t::d`

Floating point value.

### 5.2.2.6 `int globus_rls_attribute_t::i`

Integer value.

### 5.2.2.7 `char* globus_rls_attribute_t::s`

String value.

## 5.3 `globus_rls_handle_t` Struct Reference

RLS Client Handle.

### Data Fields

- `globus_url_t` [url](#)
- `globus_io_handle_t` [handle](#)
- `int` [flags](#)

### 5.3.1 Detailed Description

RLS Client Handle.

### 5.3.2 Field Documentation

#### 5.3.2.1 `globus_url_t globus_rls_handle_t::url`

URL of RLS server (RLS://host[:port]).

#### 5.3.2.2 `globus_io_handle_t globus_rls_handle_t::handle`

Globus IO handle.

### 5.3.2.3 int globus\_rls\_handle\_t::flags

See FH\_XXX flags below.

## 5.4 globus\_rls\_rli\_info\_t Struct Reference

Information about RLI server, returned by [globus\\_rls\\_client\\_lrc\\_rli\\_info\(\)](#) and [globus\\_rls\\_client\\_lrc\\_rli\\_list\(\)](#).

### Data Fields

- char [url](#) [256]
- int [updateinterval](#)
- int [flags](#)
- time\_t [lastupdate](#)

### 5.4.1 Detailed Description

Information about RLI server, returned by [globus\\_rls\\_client\\_lrc\\_rli\\_info\(\)](#) and [globus\\_rls\\_client\\_lrc\\_rli\\_list\(\)](#).

### 5.4.2 Field Documentation

#### 5.4.2.1 char globus\_rls\_rli\_info\_t::url[256]

URL of server.

#### 5.4.2.2 int globus\_rls\_rli\_info\_t::updateinterval

Interval between softstate updates.

#### 5.4.2.3 int globus\_rls\_rli\_info\_t::flags

RLI flags (see [FRLI\\_BLOOMFILTER](#)).

#### 5.4.2.4 time\_t globus\_rls\_rli\_info\_t::lastupdate

Time of last softstate update.

## 5.5 globus\_rls\_sender\_info\_t Struct Reference

Information about server sending updates to an rli, returned by [globus\\_rls\\_client\\_rli\\_sender\\_list\(\)](#).

### Data Fields

- char [url](#) [256]
- time\_t [lastupdate](#)

### 5.5.1 Detailed Description

Information about server sending updates to an rli, returned by [globus\\_rls\\_client\\_rli\\_sender\\_list\(\)](#).

## 5.5.2 Field Documentation

### 5.5.2.1 char globus\_rls\_sender\_info\_t::url[256]

URL of server.

### 5.5.2.2 time\_t globus\_rls\_sender\_info\_t::lastupdate

Time of last softstate update.

## 5.6 globus\_rls\_stats\_t Struct Reference

Various configuration options and statistics about an RLS server returned in the following structures by [globus\\_rls\\_client\\_stats\(\)](#).

### Data Fields

- int [flags](#)

### 5.6.1 Detailed Description

Various configuration options and statistics about an RLS server returned in the following structures by [globus\\_rls\\_client\\_stats\(\)](#).

See [RLS\\_LRCSERVER](#) for possible flags values.

## 5.6.2 Field Documentation

### 5.6.2.1 int globus\_rls\_stats\_t::flags

See [RLS\\_LRCSERVER](#).

## 5.7 globus\_rls\_string2\_bulk\_t Struct Reference

String pair result with return code, returned by bulk query operations.

### 5.7.1 Detailed Description

String pair result with return code, returned by bulk query operations.

## 5.8 globus\_rls\_string2\_t Struct Reference

String pair result.

### Data Fields

- char \* [s1](#)
- char \* [s2](#)

### **5.8.1 Detailed Description**

String pair result.

Many of the query functions use this to return pairs of strings (eg LFN,PFN or LFN,LRC).

### **5.8.2 Field Documentation**

#### **5.8.2.1 char\* globus\_uls\_string2\_t::s1**

First string in pair (eg LFN).

#### **5.8.2.2 char\* globus\_uls\_string2\_t::s2**

Second string in pair (eg PFN or LRC).

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