



Globus Online Transfer API

Integrating Portals and rich client applications with the Globus Online Transfer Service.



Outline

- **Transfer Service concepts**
- **API concepts**
 - **RESTful design**
 - **Authentication**
 - **Error handling**
- **Live demonstration!**
- **Python tutorial**





The Transfer Service

- **Task** - batch of file transfer operations submitted together, identified by ID string
- **Event** – errors and information about the progress of a subtask
- **Endpoint** - bookmark for a gridftp server
- **Activation** - delegating temporary credential to transfer service



REST API Concepts

- **A web application for programs, not for humans**
- **Application state is queried and updated by exchanging documents representing the state over HTTP or HTTPS**
- **HTTP request methods (verbs):**
 - **GET: fetch documents**
 - **POST: create documents, custom operations**
 - **PUT: update documents**
 - **DELETE: delete documents**



A RESTful API for Transfer

- **Data oriented instead of command oriented: document types for endpoint, task, endpoint list, task list, with structured URLs for accessing each**
- **Documents are represented in JSON**
- **Some operations are not strictly RESTful and have a more RPC style (e.g. activation)**
- **Lists are paged (default 10); most support filtering**
- **URL parameters must be URL encoded (e.g. # → %23)**



From Command Line to REST

- **status**
- **details ID**
- **endpoint-list**
- **events ID**
- **Is NAME/PATH**
- **/task_list**
- **/task/ID**
- **/endpoint_list**
- **/task/ID/event_list**
- **/endpoint/NAME/Is?**
path=PATH



Authentication

Three options:

- **Goauth with client_credential:** basic auth to get token from Nexus, pass token to Transfer API in Authorization header. Simplest method for development; also appropriate for trusted thick clients.
- **Goauth with OAuth 2.0:** for web applications, portal integration
- **SSL client authentication:** use an existing grid credential (X.509 certificate) to authenticate



Base URL

<https://transfer.api.globusonline.org/VERSION>

Current Version: v0.10

- All URLs are given relative to the base URL, e.g. /tasksummary means <https://transfer.api.globusonline.org/v0.10/tasksummary>
- Python and Java client libraries also use relative URLs, prepending the base URL.



Simple Example: list directory

API:

GET /endpoint/go%23ep1/ls?path=/share/godata

Python:

```
code, reason, data = api.endpoint_ls("go#ep1", path="/share/godata")
for file_item in data["DATA"]:
    print file_item["name"]
```

Java:

```
String resource = "/endpoint/" + URLEncoder.encode("go#ep1") + "/ls";
Map<String, String> params = new HashMap<String,String>();
params.put("path", "/share/godata");
JSONTransferAPIClient.Result r = client.getResult(resource, params);
JSONArray fileArray = r.document.getJSONArray("DATA");
for (int i=0; i < fileArray.length(); i++) {
    JSONObject fileObject = fileArray.getJSONObject(i);
    System.out.println(" " + fileObject.getString("name"));
}
```



Error Handling

- **Fields: code, message, request_id, resource**
- **ServerError – our fault, file a bug report**
- **ClientError – your fault**
- **ExternalError – someone else's fault (e.g. external myproxy or gridftp server)**
- **ServiceUnavailable – scheduled down time**



Auto Activation

Problem:

Many endpoints use the same identity provider, and the user should not be required to enter credentials for each one separately.

Solution:

Auto-activation allows the client to request lazy credential sharing. If an endpoint with the same identity provider is already activated for the user, it shares that credential and does not require further input.



Auto Activation: GO identity provider

- Globus Connect endpoints, tutorial endpoints, and the new shared endpoints all use the internal Globus Online identity provider. Since the user is already authenticated, these endpoints require no external credentials, and can always be auto-activated.



Tutorial

`https://transfer.api.globusonline.org/gw13.html`



Directory Listing

GET /endpoint/NAME/ls?path=...

- **Endpoint must be activated first**
- **Default path - “~/”, or “/” for anonymous ftp.
Note: may not exist.**
- **Supports standard sorting and filtering options.**



Transfer

GET /transfer/submission_id

POST /transfer

- The submission id is used for 'once and only once' submission.
- Create a transfer document, adding transfer_item subdocuments for each source/destination pair.
- POST the document, getting the task_id from the response.



Monitoring

GET /task/ID

GET /task/ID/event_list

- **NOTE:** use the `task_id` from the transfer result, not the `submission_id`.



Getting Help

1. Read the documentation and code examples:

<https://transfer.api.globusonline.org/>

2. Join the mailing list and post questions:

<http://lists.globusonline.org/mailman/listinfo/transfer-api>