

Clowder API Examples

The purpose of this document is to detail some common example of interacting with the REST API of a running Clowder application.

- [Prerequisites](#)
 - [Tooling](#)
- [Exploring the REST API](#)
- [Authenticating](#)
 - [Basic Auth \(Insecure\)](#)
 - [User API Keys \(Recommended\)](#)
 - - [Creating a Key via REST API](#)
 - [Retrieving Keys via REST API](#)
 - [Deleting Keys via REST API](#)
 - [Manual Cookie Auth \(Not recommended\)](#)
- [Spaces](#)
- [Datasets](#)
 - [Listing Datasets](#)
 - [Querying Dataset Metadata](#)
 - [Download a Dataset](#)
- [Files](#)
 - [Listing Files](#)
 - [Querying File Metadata](#)
 - [Download a File](#)

Prerequisites

- Any one of a large number of API testing tools (see "Tooling" below)
- A running Clowder instance
 - Assumption: your Clowder instance is running at <http://localhost:9000>

Tooling

These instructions will use raw `curl` commands to test the Clowder API but you can use:

- [Swagger UI](#)
- [Postman](#)
- [Soap UI](#)
- [Assertible](#)
- [Rest-Assured](#)
- or any other [REST API testing tool](#)

Exploring the REST API

You can use the Swagger UI to explore existing API endpoints on the system: <https://clowder.ncsa.illinois.edu/swagger/>

Parameters in the API endpoints will appear in {curly-braces}.

NOTE: It appears as if this list does not include **all** necessary endpoints. For example, there does not appear to be a way to authenticate without using Swagger's built-in "Authorize" function.

Authenticating

Methods:

- Basic Auth
- API keys
- Cookie (Manual)

Basic Auth (Insecure)

If you are just testing a simple case and would like to use your Clowder credentials directly (instead of an API key), you can pass your Clowder credentials using Basic Auth:

```
$ curl -XPOST 'localhost:9000/api/users/keys?name=testkey' --basic -u 'YourUsername:YourPassword'
{"name":"testkey","key":"257be5f9-e685-4dec-8bed-c4c9dcc0b92"}
```

NOTE: We recommend using API keys over embedded credentials, as it allows you to more easily revoke access in cases where the system has been compromised.

WARNING: Using this auth method will leave your password in your bash history in plaintext (e.g. try running `history | grep basic`)

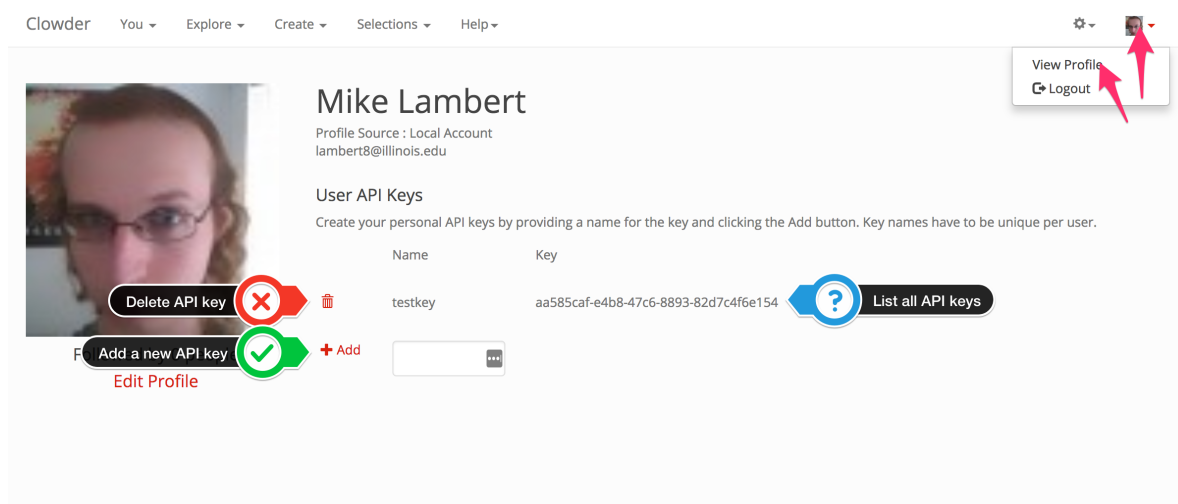
SECURITY WARNING: NEVER use Basic Auth without HTTPS - your credentials will be submitted in plaintext, and anyone sniffing the network traffic can see your password.

User API Keys (Recommended)

For simplicity, you can manage your User API keys in the Clowder UI:

1. Log into Clowder
2. At the top-right expand the dropdown containing your user profile picture
3. Select "View Profile" from the dropdown

This will take you to the `/profile/viewProfile/{user-id}` view that will list your existing API keys, as well as allowing you to create and delete them:



You can also use the REST API to generate a new API key, but you'll need to authenticate manually first.

These endpoints can be used to create a user-specific API key for interacting with the Clowder API.

Creating a Key via REST API

Relevant endpoints:

- `POST /api/users/keys?name={key-name}`

To create a new API key with the given name:

```
$ curl -XPOST 'localhost:9000/api/users/keys?name=testkey' --basic -u 'YourUsername:YourPassword'
{"name": "testkey", "key": "257be5f9-e685-4dec-8bed-c4c9dccb0b92"}
```

You can then attach this key as a query string parameter named **key** for all subsequent API requests, instead of needing to reauthenticate manually and attaching another cookie.

For example, using a User API key to call the `/api/users/keys` endpoint would look like this:

```
$ curl localhost:9000/api/users/keys?key=257be5f9-e685-4dec-8bed-c4c9dccb0b92
[{"name": "testkey", "key": "257be5f9-e685-4dec-8bed-c4c9dccb0b92", "identityId": {"userId": "YourUsername", "providerId": "userpass"}}]
```

Retrieving Keys via REST API

Relevant endpoints:

- GET /api/users/keys
- GET /api/users/keys/{key-name}

To retrieve a list of all existing API keys for this user:

```
$ curl --insecure http://localhost:9000/api/users/keys?key=257be5f9-e685-4dec-8bed-c4c9dcc0b92 [{"name":"testkey", "key":"257be5f9-e685-4dec-8bed-c4c9dcc0b92", "identityId":{"userId":"YourUsername", "providerId":"userpass"}}]
```

To retrieve a specific API key by name:

```
$ curl --insecure http://localhost:9000/api/users/keys/testkey?key=257be5f9-e685-4dec-8bed-c4c9dcc0b92 [{"name":"testkey", "key":"257be5f9-e685-4dec-8bed-c4c9dcc0b92", "identityId":{"userId":"YourUsername", "providerId":"userpass"}}]
```

Deleting Keys via REST API

Relevant endpoints:

- DELETE /api/users/keys/{key-name}

To delete an existing API key:

```
$ curl --insecure 'http://localhost:9000/api/users/keys/testkey?key=257be5f9-e685-4dec-8bed-c4c9dcc0b92'
```

Manual Cookie Auth (Not recommended)

Relevant endpoint:

- GET /authenticate/{provider}

Accepted provider values:

- userpass

```
$ curl --insecure http://localhost:9000/authenticate/userpass -vvv -XPOST --header 'Content-Type: application/x-www-form-urlencoded' --data-urlencode 'username=YourUsername' --data-urlencode 'password=YourPassword'
* Trying ::1...
* TCP_NODELAY set
* Connected to localhost (::1) port 9000 (#0)
> POST /authenticate/userpass HTTP/1.1
> Host: localhost:9000
> User-Agent: curl/7.54.0
> Accept: */*
> Content-Type: application/x-www-form-urlencoded
> Content-Length: 50
>
* upload completely sent off: 50 out of 50 bytes
< HTTP/1.1 303 See Other
< Access-Control-Allow-Origin: *
< Location: /
< Access-Control-Allow-Headers:
< Access-Control-Allow-Methods: *
< Access-Control-Allow-Credentials: true
< Set-Cookie:
id=3656a7a78433b52522cc4cd3d1b42579e76ee46c688faa5e5c4259623dfe83531008669ad7769e600ba9d1d94b2d590710d9c9cc98f6b79728ec2cd6e043f97c6e69d5d21e0ba6f7ff0528fa310bf1f2d5002348e3c2b9957d47905ac030de57b2bd9deffd450b32ee452d4c87543f65476be709ccebb7be3b0773e8488bb496; Path=/; HTTPOnly
< Set-Cookie: PLAY_SESSION=; Expires=Mon, 06 Aug 2018 20:54:32 GMT; Path=/; HTTPOnly
< Content-Length: 0
<
* Connection #0 to host localhost left intact
```

The important bit here is the **Set-Cookie: id=#####** line. You will need to save this response cookie value and pass it in with all subsequent requests. For example, see "Log Out" below.

NOTE: Notice that the POST body here is **URL-encoded Form Data**, and not JSON.

To log out after you are done:

```
$ curl --insecure http://localhost:9000/logout -vvv --cookie
'id=3656a7a78433b52522cc4cd3d1b42579e76ee46c688faa5e5c4259623dfe83531008669ad7769e600ba9d1d94b2d590710d9c9cc98f6b79728ec2cd6e043f97c6e69d5d21e0ba6f7ff0528fa310bf1f2d5002348e3c2b9957d47905ac030de57b2bd9deffd450b32ee452d4c87543f65476be709ccebb7be3b0773e8488bb496'
* Trying ::1...
* TCP_NODELAY set
* Connected to localhost (::1) port 9000 (#0)
> GET /logout HTTP/1.1
> Host: localhost:9000
> User-Agent: curl/7.54.0
> Accept: */*
> Cookie:
id=3656a7a78433b52522cc4cd3d1b42579e76ee46c688faa5e5c4259623dfe83531008669ad7769e600ba9d1d94b2d590710d9c9cc98f6b79728ec2cd6e043f97c6e69d5d21e0ba6f7ff0528fa310bf1f2d5002348e3c2b9957d47905ac030de57b2bd9deffd450b32ee452d4c87543f65476be709ccebb7be3b0773e8488bb496
>
< HTTP/1.1 303 See Other
< Access-Control-Allow-Origin: *
< Location: /login
< Access-Control-Allow-Headers:
< Access-Control-Allow-Methods: *
< Access-Control-Allow-Credentials: true
< Set-Cookie: id=; Expires=Mon, 06 Aug 2018 20:59:05 GMT; Path=/; HTTPOnly
< Set-Cookie: PLAY_SESSION=; Expires=Mon, 06 Aug 2018 20:59:04 GMT; Path=/; HTTPOnly
< Content-Length: 0
<
* Connection #0 to host localhost left intact
```

Make sure to pass in the **id** cookie value that you received during the "Log In" step above.

NOTE: You will notice that now the Set-Cookie response is settings the id cookie to an empty string - this clears your auth cookie from the browser, so you may discard the cookie that you received above as it may no longer be valid.

Spaces

Relevant endpoints:

- GET /api/spaces
- GET /api/spaces/{space_id}/datasets

To list all spaces that you can view:

```
$ curl --insecure http://localhost:9000/api/spaces?key=257be5f9-e685-4dec-8bed-c4c9dccb0b92
[{"id":"5b6a0cf877c86409e0925d85","name":"a space","description":"","created":"Tue Aug 07 16:19:52 CDT 2018"},
{"id":"5b21310077c8829cd73f8899","name":"test","description":"","created":"Wed Jun 13 09:58:08 CDT 2018"},
{"id":"5b0724b277c85c0c70e371d8","name":"newspace","description":"","created":"Thu May 24 15:46:42 CDT 2018"},
{"id":"5ad7b4b777c8a52d73b2ac48","name":"test","description":"","created":"Wed Apr 18 16:12:23 CDT 2018"}]
```

To list all datasets within a space:

```
$ curl --insecure http://localhost:9000/api/spaces/5b0724b277c85c0c70e371d8/datasets?key=257be5f9-e685-4dec-8bed-c4c9dccb0b92
[{"id":"5b4e510577c8fff0a479786c","name":"asdf","description":"","created":"Tue Jul 17 15:26:45 CDT 2018","thumbnail":"None","authorId":"5ad76e39693ea57ec7f8648a","spaces":["5b0724b277c85c0c70e371d8"]}]
```

Datasets

Relevant endpoints:

- GET /api/datasets
- GET /api/datasets/canEdit
- GET /api/datasets/{dataset_id}
- GET /api/datasets/{dataset_id}/metadata
- GET /api/datasets/{dataset_id}/download

Listing Datasets

Relevant endpoints:

- GET /api/datasets
- GET /api/datasets/canEdit

To list all datasets that you can view:

```
$ curl --insecure http://localhost:9000/api/datasets?key=257be5f9-e685-4dec-8bed-c4c9dccb0b92
[{"id":"5b4e510577c8fff0a479786c","name":"asdf","description":"","created":"Tue Jul 17 15:26:45 CDT 2018","thumbnail":"None","authorId":"5ad76e39693ea57ec7f8648a","spaces":["5b0724b277c85c0c70e371d8"]}, {"id":"5ad7b5b377c8a52d73b2ac5f","name":"test_dataset","description":"","created":"Wed Apr 18 16:16:35 CDT 2018","thumbnail":"None","authorId":"5ad76e39693ea57ec7f8648a","spaces":["5ad7b4b777c8a52d73b2ac48"]}]
```

To list all datasets that you can edit:

```
$ curl --insecure http://localhost:9000/api/datasets/canEdit?key=257be5f9-e685-4dec-8bed-c4c9dccb0b92
[{"id":"5b4e510577c8fff0a479786c","name":"asdf","description":"","created":"Tue Jul 17 15:26:45 CDT 2018","thumbnail":"None","authorId":"5ad76e39693ea57ec7f8648a","spaces":["5b0724b277c85c0c70e371d8"]}, {"id":"5ad7b5b377c8a52d73b2ac5f","name":"test_dataset","description":"","created":"Wed Apr 18 16:16:35 CDT 2018","thumbnail":"None","authorId":"5ad76e39693ea57ec7f8648a","spaces":["5ad7b4b777c8a52d73b2ac48"]}]
```

Querying Dataset Metadata

Relevant endpoints:

- GET /api/datasets/{dataset_id}
- GET /api/datasets/{dataset_id}/metadata

To retrieve a single dataset:

```
$ curl --insecure http://localhost:9000/api/datasets/5b4e510577c8fff0a479786c?key=257be5f9-e685-4dec-8bed-c4c9dccb0b92
{"id":"5b4e510577c8fff0a479786c","name":"asdf","description":"","created":"Tue Jul 17 15:26:45 CDT 2018","thumbnail":"None","authorId":"5ad76e39693ea57ec7f8648a","spaces":["5b0724b277c85c0c70e371d8"]}
```

To retrieve user-defined metadata for this dataset:

```
$ curl --insecure http://localhost:9000/api/datasets/5b4e510577c8ffff0a479786c/metadata?key=257be5f9-e685-4dec-8bed-c4c9dccb0b92
[{"id":"5b0724b277c85c0c70e371dd","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Alternative Title","uri":"http://purl.org/dc/terms/alternative","type":"string"}},{ "id":"5b21425beff884a87ef11887","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Alternative Title","uri":"http://purl.org/dc/terms/alternative","type":"string"}},{ "id":"5b21425beff884a87ef11888","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Audience","uri":"http://purl.org/dc/terms/audience","type":"string"}},{ "id":"5b0724b277c85c0c70e371de","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Audience","uri":"http://purl.org/dc/terms/audience","type":"string"}},{ "id":"5b21425beff884a87ef1188b","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"CSDMS Standard Name","uri":"http://csdms.colorado.edu/wiki/CSN_Searchable_List","type":"list","definitions_url":"http://ecgs.ncsa.illinois.edu/gsis/CSN"}},{ "id":"5b0724b277c85c0c70e371df","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"CSDMS Standard Name","uri":"http://csdms.colorado.edu/wiki/CSN_Searchable_List","type":"list","definitions_url":"http://ecgs.ncsa.illinois.edu/gsis/CSN"}},{ "id":"5b0724b277c85c0c70e371e0","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Date and Time","uri":"http://purl.org/dc/terms/date","type":"datetime"}},{ "id":"5b21425beff884a87ef1188a","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Date and Time","uri":"http://purl.org/dc/terms/date","type":"datetime"}},{ "id":"5b0724b277c85c0c70e371e1","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Funding Institution","uri":"http://sead-data.net/terms/FundingInstitution","type":"string"}},{ "id":"5b21425beff884a87ef11891","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Funding Institution","uri":"http://sead-data.net/terms/FundingInstitution","type":"string"}},{ "id":"5b0724b277c85c0c70e371e2","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"GeoJSON","uri":"http://geojson.org/geojson-spec.html","type":"wkt"}},{ "id":"5b21425beff884a87ef11896","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"GeoJSON","uri":"http://geojson.org/geojson-spec.html","type":"wkt"}},{ "id":"5b0724b277c85c0c70e371e3","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Grant Number","uri":"http://sead-data.net/terms/GrantNumber","type":"string"}},{ "id":"5b21425beff884a87ef11892","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Grant Number","uri":"http://sead-data.net/terms/GrantNumber","type":"string"}},{ "id":"5b0724b277c85c0c70e371e4","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"ODM2 Variable Name","uri":"http://vocabulary.odm2.org/variablename","type":"list","definitions_url":"http://ecgs.ncsa.illinois.edu/gsis/sas/sn/odm2"}},{ "id":"5b21425beff884a87ef1188c","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"ODM2 Variable Name","uri":"http://vocabulary.odm2.org/variablename","type":"list","definitions_url":"http://ecgs.ncsa.illinois.edu/gsis/sas/sn/odm2"}},{ "id":"5b0724b277c85c0c70e371e5","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Primary /Initial Publication","uri":"http://sead-data.net/terms/PrimaryPublication","type":"string"}},{ "id":"5b21425beff884a87ef11895","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Primary/Initial Publication","uri":"http://sead-data.net/terms/PrimaryPublication","type":"string"}},{ "id":"5b21425beff884a87ef11890","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Principal Investigator(s)","uri":"http://sead-data.net/terms/PrincipalInvestigator","type":"string"}},{ "id":"5b0724b277c85c0c70e371e6","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Principal Investigator(s)","uri":"http://sead-data.net/terms/PrincipalInvestigator","type":"string"}},{ "id":"5b0724b277c85c0c70e371e7","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"References","uri":"http://purl.org/dc/terms/references","type":"string"}},{ "id":"5b21425beff884a87ef11889","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"References","uri":"http://purl.org/dc/terms/references","type":"string"}},{ "id":"5b0724b277c85c0c70e371e8","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Related Publications","uri":"http://sead-data.net/terms/RelatedPublications","type":"string"}},{ "id":"5b21425beff884a87ef11893","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Related Publications","uri":"http://sead-data.net/terms/RelatedPublications","type":"string"}},{ "id":"5b0724b277c85c0c70e371e9","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"SAS Spatial Geocode","uri":"http://ecgs.ncsa.illinois.edu/gsis/sas/geocode","type":"listgeocode","definitions_url":"http://ecgs.ncsa.illinois.edu/gsis/sas/geocode","query_parameter":"loc"}},{ "id":"5b21425beff884a87ef1188e","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"SAS Spatial Geocode","uri":"http://ecgs.ncsa.illinois.edu/gsis/sas/geocode","type":"listgeocode","definitions_url":"http://ecgs.ncsa.illinois.edu/gsis/sas/geocode","query_parameter":"loc"}},{ "id":"5b0724b277c85c0c70e371ea","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"SAS Variable Name","uri":"http://ecgs.ncsa.illinois.edu/gsis/sas/vars","type":"scientific_variable","definitions_url":"http://ecgs.ncsa.illinois.edu/gsis/sas/vars/unit/udunits2","query_parameter":"term"}},{ "id":"5b21425beff884a87ef1188d","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"SAS Variable Name","uri":"http://ecgs.ncsa.illinois.edu/gsis/sas/vars","type":"scientific_variable","definitions_url":"http://ecgs.ncsa.illinois.edu/gsis/sas/vars/unit/udunits2","query_parameter":"term"}},{ "id":"5b0724b277c85c0c70e371eb","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Time Periods","uri":"http://purl.org/dc/terms/PeriodOfTime","type":"string"}},{ "id":"5b21425beff884a87ef11894","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Time Periods","uri":"http://purl.org/dc/terms/PeriodOfTime","type":"string"}},{ "id":"5b21425beff884a87ef1188f","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Unit","uri":"http://ecgs.ncsa.illinois.edu/gsis/sas/unit/udunits2","type":"list","definitions_url":"http://ecgs.ncsa.illinois.edu/gsis/sas/unit/udunits2"}},{ "id":"5b0724b277c85c0c70e371ec","spaceId":"5b0724b277c85c0c70e371d8","json":{"label":"Unit","uri":"http://ecgs.ncsa.illinois.edu/gsis/sas/unit/udunits2","type":"list","definitions_url":"http://ecgs.ncsa.illinois.edu/gsis/sas/unit/udunits2"}}]
```

Download a Dataset

Relevant endpoints:

- GET /api/datasets/{dataset_id}/download

To download an entire dataset as a .zip file:

```
$ curl --insecure http://localhost:9000/api/datasets/5b4e510577c8fff0a479786c/download?key=257be5f9-e685-4dec-8bed-c4c9dccb0b92
E?Mdata//_info.jsonE??n?0
      ??<??3?Z??&8 4.?/gX
                                     ??m???%?8???[??
                                     AV?B?;?m#??s?~m???0
... .. etc etc etc ... .. etc etc etc ... .. etc etc etc ... .. etc etc etc
... .. etc etc etc
```

NOTE: The response here is the raw bytes of a ZIP file, so it will seem like nonsense is being returned from curl.

Files

Relevant endpoints:

- GET /api/datasets/{dataset_id}/listFiles
- GET /api/datasets/{dataset_id}/listAllFiles
- GET /api/files/{file_id}/metadata
- GET /api/files/{file_id}/metadata.jsonld
- GET /api/files/{file_id}

Listing Files

Relevant endpoints:

- GET /api/datasets/{dataset_id}/listFiles
- GET /api/datasets/{dataset_id}/listAllFiles

To list all files within a dataset:

```
$ curl --insecure http://localhost:9000/api/datasets/5b4e510577c8fff0a479786c/listFiles?key=257be5f9-e685-4dec-8bed-c4c9dccb0b92
[{"size": "70561", "date-created": "Tue Jul 17 15:26:54 CDT 2018", "id": "5b4e510e77c8fff0a4797871", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 15:27:27 CDT 2018", "id": "5b4e512f77c8fff0a4797879", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 15:54:14 CDT 2018", "id": "5b4e577677c8fff0a47978a4", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 15:58:57 CDT 2018", "id": "5b4e589177c8fff0a47978d7", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 15:59:23 CDT 2018", "id": "5b4e58ab77c8fff0a4797900", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 15:59:52 CDT 2018", "id": "5b4e58c877c8fff0a479792a", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 16:10:54 CDT 2018", "id": "5b4e5b5e77c8fff0a4797970", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 16:12:24 CDT 2018", "id": "5b4e5bb877c8fff0a479799a", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 16:14:56 CDT 2018", "id": "5b4e5c5077c8fff0a47979cc", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 16:15:53 CDT 2018", "id": "5b4e5c8977c8fff0a47979e1", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 16:15:57 CDT 2018", "id": "5b4e5c8d77c8fff0a47979e7", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 16:16:16 CDT 2018", "id": "5b4e5ca077c8fff0a47979ed", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 16:16:41 CDT 2018", "id": "5b4e5cb977c8fff0a47979fa", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 16:16:57 CDT 2018", "id": "5b4e5cc977c8fff0a4797a0b", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 16:17:14 CDT 2018", "id": "5b4e5cda77c8fff0a4797a1c", "contentType": "image/png", "filename": "244599644.png"}, {"size": "70561", "date-created": "Tue Jul 17 16:35:30 CDT 2018", "id": "5b4e612277c8fff0a4797a36", "contentType": "image/png", "filename": "244599644.png"}]
```

Querying File Metadata

Relevant endpoints:

- GET /api/files/{file_id}/metadata
- GET /api/files/{file_id}/metadata.jsonld

To list off static metadata for a file (e.g. file name, type, size, creation date):

```
$ curl --insecure http://localhost:9000/api/files/5b4e577677c8fff0a47978a4/metadata?key=257be5f9-e685-4dec-8bed-c4c9dccb0b92
{"size": "70561", "date-created": "Tue Jul 17 15:54:14 CDT 2018", "id": "5b4e577677c8fff0a47978a4", "authorId": "5ad76e39693ea57ec7f8648a", "content-type": "image/png", "filename": "244599644.png", "status": "PROCESSED", "filedescription": ""}
```

To list off dynamic metadata for a file (e.g. extracted or community-added metadata):

```
$ curl --insecure http://localhost:9000/api/files/5b4e5cb977c8fff0a47979fa/metadata.jsonld?key=257be5f9-e685-4dec-8bed-c4c9dccb0b92
[{"@context": {"@vocab": "http://www.w3.org/2003/12/exif/ns"}, "attached_to": {"resource_type": "cat:file", "url": "http://localhost:9000/files/5b4e5cb977c8fff0a47979fa"}, "created_at": "Tue Jul 17 16:16:41 CDT 2018", "agent": {"@type": "cat:extractor", "name": "http://141.142.60.27:9000//api/extractors/ncsa.image.metadata", "extractor_id": "http://141.142.60.27:9000//api/extractors/ncsa.image.metadata"}, "content": {"Border color": "srgba(223,223,223,1)", "Compression": "Zip", "Elapsed time": "0:01.009", "Artifacts": {"verbose": true, "filename": "/tmp/tmp7ecihP.png"}, "height": 341, "Interlace": "None", "Compose": "Over", "Tainted": false, "Filesize": "70.6KB", "Pixels per second": "12.58MB", "Chromaticity": {"red primary": "(0.64,0.33)", "green primary": "(0.3,0.6)", "blue primary": "(0.15,0.06)", "white point": "(0.3127,0.329)"}, "Type": "TrueColorAlpha", "Print size": "5.125x4.73611", "Channel depth": {"blue": "8-bit", "alpha": "1-bit", "green": "8-bit", "red": "8-bit"}, "Background color": "white", "Transparent color": "none", "Mime type": "image/png", "Format": "PNG (Portable Network Graphics)", "Image statistics": {"Overall": {"skewness": 2.67042, "min": "0 (0)", "max": "255 (1)", "standard deviation": "40.5176 (0.158893)", "kurtosis": 10.2121, "mean": "59.7823 (0.23444)"}}, "Number pixels": "126K", "width": 369, "Channel statistics": {"Blue": {"skewness": 1.15542, "min": "33 (0.129412)", "max": "255 (1)", "standard deviation": "45.9088 (0.180035)", "kurtosis": 0.797616, "mean": "101.427 (0.397754)"}, "Alpha": {"skewness": 0, "min": "255 (1)", "max": "255 (1)", "standard deviation": "0 (0)", "kurtosis": 0, "mean": "255 (1)"}, "Green": {"skewness": 1.33268, "min": "35 (0.137255)", "max": "255 (1)", "standard deviation": "46.7538 (0.183348)", "kurtosis": 1.12144, "mean": "82.284 (0.322682)"}, "Pixels": 125829, "Red": {"skewness": 1.9517, "min": "0 (0)", "max": "255 (1)", "standard deviation": "47.6777 (0.186972)", "kurtosis": 3.54331, "mean": "55.418 (0.217325)"}}, "Class": "DirectClass", "Matte color": "grey74", "Page geometry": "369x341+0+0", "Geometry": "369x341+0+0", "Colorspace": "sRGB", "Depth": "8-bit", "User time": "0.010u", "Rendering intent": "Perceptual", "Resolution": "72x72", "Gamma": 0.45455, "Image": "/tmp/tmp7ecihP.png", "Properties": {"date": {"create": "2018-07-17T21:16:58+00:00", "modify": "2018-07-17T21:16:58+00:00"}, "png": {"bKGD": "chunk was found (see Background color, above)", "IHDR": {"color-type-orig": 6, "color_type": "6 (RGBA)", "bit_depth": 8, "width,height": "369, 341", "bit-depth-orig": 8, "interlace_method": "0 (Not interlaced)", "pHYs": {"x_res=72, y_res=72, units=0", "text": "2 tEXt/zTXt/iTXt chunks were found", "sRGB": "intent=0 (Perceptual Intent)", "gAMA": "gamma=0.45455 (See Gamma, above)", "cHRM": "chunk was found (see Chromaticity, above)", "signature": "d63ba6d42ca061b2103c98d480e72d26d704eb259eda0cda3797eb26dfbfe1fd"}, "Version": "ImageMagick 6.8.9-9 Q16 x86_64 2017-07-31 http://www.imagemagick.org", "Iterations": 0}}}]}
```

Download a File

Relevant endpoints:

- GET /api/files/{file_id}

To download a particular file:

```
$ curl --insecure http://localhost:9000/api/files/5b4e5cb977c8fff0a47979fa?key=257be5f9-e685-4dec-8bed-c4c9dccb0b92
?PNG

IHDRq?gAMA??
      ?asRGB??? cHRMz&?????u0?` :?p??Q<bKGD???????          pHYsHHF?k>?IDATx???W?\\i??          ???v=????
UWuU??, ?i?6?????????|?????????&??a7??-??U]??R?3?:Z?G?VW??uWd ?L $???o@??????|???p?w?.t?A|&!>?t?Atppt?xt?g!At?
FG?w?A|?|??|??????? ?(????? ????n?q??]???q?W?5:A??At?9??Q?0??'????CFz(?*\\??0:??QDA???
... .. etc etc etc ... ..
... ..
```

NOTE: The response here is the raw bytes of a ZIP file, so it will seem like nonsense is being returned from curl.