RESTful HTTP API - Containers

- **GET** Retrieve the content of the resource
- **POST** Create new resources within a LDP container
- **PUT** Create a resource with a specified path, or replace the triples associated with a resource with the triples provided in the request body.
- **DELETE** Delete a resource
- **PATCH** Modify the triples associated with a resource with SPARQL-Update
- **HEAD** Retrieve the resource headers
- **OPTIONS** Outputs information about the supported HTTP methods, etc.
- **MOVE** Move a resource (and its subtree) to a new location
- **COPY** Copy a resource (and its subtree) to a new location

Request URI: `/path/to/some/resource`

Methods: GET, POST, PUT, PATCH, HEAD, OPTIONS, DELETE, MOVE, COPY

---

**GET**

Retrieve the content of the resource

**Request Headers:**

<table>
<thead>
<tr>
<th>Header</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RANGE</td>
<td>Byte range of content to retrieve, of the form: &quot;Range: bytes=500-999&quot;</td>
</tr>
<tr>
<td>ACCEPT</td>
<td>RDF sources support content negotiation with these formats: application/l+json, application/n-triples, application/rdf+xml, application/x-turtle, application/xhtml+xml, application/xml, text/html, text/n3, text/plain, text/rdf+n3, text/turtle</td>
</tr>
</tbody>
</table>

Note: JSON-LD profiles can be requested by using the following Accept headers:

- `Accept: application/l+json; profile="http://www.w3.org/ns/l+json#expanded"` - default
- `Accept: application/l+json; profile="http://www.w3.org/ns/l+json#compacted"`
- `Accept: application/l+json; profile="http://www.w3.org/ns/l+json#flattened"

**Limit**

Number of child resources to list. If paired with Accept: (X)HTML, the default is 100. Otherwise, the default is -1 (all children are listed)

**If-None-Match**

**If-Modified-Since**

**Prefer**

`return=minimal`

`return=representation; include="URIs"`

`return=representation; omit="URIs"`

where minimal indicates that only triples directly related to a resource should be returned, and representation indicates that links to other resources and their properties should also be included. **URIs** is a space-separate list of LDP defined preferences, and also:

<table>
<thead>
<tr>
<th>URI</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://fedora.info/definitions/fcrepo#PreferInboundReferences">http://fedora.info/definitions/fcrepo#PreferInboundReferences</a></td>
<td>Include assertions from other Fedora resources to this node (excluded from representation by default)</td>
</tr>
<tr>
<td><a href="http://fedora.info/definitions/v4/repository#ServerManaged">http://fedora.info/definitions/v4/repository#ServerManaged</a></td>
<td>Embed server managed properties in the representation (enabled by default)</td>
</tr>
<tr>
<td><a href="http://www.w3.org/ns/oai#PreferContainedDescriptions">http://www.w3.org/ns/oai#PreferContainedDescriptions</a></td>
<td>Embed &quot;child&quot; resources in the returned representation</td>
</tr>
<tr>
<td><a href="http://www.w3.org/ns/l+json#PreferContainment">http://www.w3.org/ns/l+json#PreferContainment</a></td>
<td>Include/Exclude &quot;l+json:contains&quot; assertions to contained resources (enabled by default)</td>
</tr>
<tr>
<td><a href="http://www.w3.org/ns/l+json#PreferMembership">http://www.w3.org/ns/l+json#PreferMembership</a></td>
<td>Include/Exclude assertions to member resources established by the Direct and Indirect containers (enabled by default)</td>
</tr>
<tr>
<td><a href="http://www.w3.org/ns/l+json#PreferMinimalContainer">http://www.w3.org/ns/l+json#PreferMinimalContainer</a></td>
<td>Include/Exclude triples that would be present when the container is empty (enabled by default)</td>
</tr>
</tbody>
</table>

Example (1): Turtle
curl -H "Accept: text/turtle" "http://localhost:8080/rest/path/to/resource"

Response:

Status: 200 OK

Headers:
ETag: "0ed38fe211c2663ace5322e790e7b7d60169e00"
Last-Modified: Mon, 19 May 2014 19:44:59 GMT
Preference-Applied: return=representation; include="http://www.w3.org/ns/ldp#PreferMembership http://www.w3.org/ns/ldp#PreferContainment"
Vary: Prefer
Accept-Patch: application/sparql-update
Allow: MOVE,COPY,DELETE,POST,HEAD,GET,PUT,PATCH,OPTIONS
Accept-Post: text/turtle,text/rdf+n3,application/n3,text/n3,application/rdf+xml,application/n-triples,multipart/form-data,application/sparql-update
Link: <http://www.w3.org/ns/ldp#Resource>;rel="type"
Content-Type: text/turtle

Body:

Example (2): RDF/XML

curl -H "Accept: application/rdf+xml" "http://localhost:8080/rest/path/to/resource"

Response:

Status: 200 OK
<rdf:RDF>
  <rdf:Description rdf:about="http://localhost:8080/rest/path/to/resource">
    <hasMemberRelation xmlns="http://fedora.info/definitions/v4/repository#" rdf:resource="http://fedora.info/definitions/v4/repository#hasChild"/>
    <primaryType xmlns="http://fedora.info/definitions/v4/repository#" rdf:datatype="http://www.w3.org/2001/XMLSchema#string">nt:folder</primaryType>
    <mixinTypes xmlns="http://fedora.info/definitions/v4/repository#" rdf:datatype="http://www.w3.org/2001/XMLSchema#string">fedora:resource</mixinTypes>
    <mixinTypes xmlns="http://fedora.info/definitions/v4/repository#" rdf:datatype="http://www.w3.org/2001/XMLSchema#string">fedora:object</mixinTypes>
    <lastModifiedBy xmlns="http://fedora.info/definitions/v4/repository#" rdf:resource="http://fedora.info/definitions/v4/repository#bypassAdmin"/>
    <uuid xmlns="http://fedora.info/definitions/v4/repository#" rdf:datatype="http://www.w3.org/2001/XMLSchema#string">2b655d37-e88a-44c5-86c1-3b3935cdea49</uuid>
    <createdBy xmlns="http://fedora.info/definitions/v4/repository#" rdf:resource="http://fedora.info/definitions/v4/repository#bypassAdmin"/>
  </rdf:Description>

  <rdf:type rdf:resource="http://www.jcp.org/jcr/nt/1.0folder"/>
  <rdf:type rdf:resource="http://www.jcp.org/jcr/nt/1.0hierarchyNode"/>
  <rdf:type rdf:resource="http://www.jcp.org/jcr/nt/1.0base"/>
  <rdf:type rdf:resource="http://www.jcp.org/jcr/mix/1.0created"/>
  <rdf:type rdf:resource="http://fedora.info/definitions/v4/rest-api#resource"/>
  <rdf:type rdf:resource="http://fedora.info/definitions/v4/rest-api#object"/>
  <rdf:type rdf:resource="http://fedora.info/definitions/v4/rest-api#relations"/>
  <rdf:type rdf:resource="http://www.jcp.org/jcr/mix/1.0lastModified"/>
</rdf:RDF>
Example (3): Prefer headers


Response:
Status: 200 OK

Headers:
Date: Sat, 13 Oct 2018 00:03:25 GMT
Set-Cookie: JSESSIONID=1pgwewt9ucyw13hwo9mtjow;Path=/
Expires: Thu, 01 Jan 1970 00:00:00 GMT
Set-Cookie: rememberMe=deleteMe; Path=/; Max-Age=0; Expires=Fri, 12-Oct-2018 00:03:25 GMT
ETag: W"fee2096961dcdff1c475d394319fc34a53bec39ac"
Last-Modified: Fri, 12 Oct 2018 23:24:34 GMT
Link: <http://www.w3.org/ns/ldp#Resource>;rel="type"
Link: <http://www.w3.org/ns/ldp#Container>;rel="type"
Link: <http://www.w3.org/ns/ldp#RDFSource>;rel="type"
Link: <http://localhost:8080/rest/collection>;rel="timemap"
Link: <http://localhost:8080/rest/collection/fcr:versions>;rel="type"
Link: <http://localhost:8080/rest/collection>;rel="original"
Vary: Prefer
Vary: Accept
Vary: Range
Vary: Accept-Encoding
Vary: Accept-Language
Vary: Accept-Datetime
Content-Type: text/turtle;charset=utf-8
Content-Length: 1082
Server: Jetty(9.3.25.v20180904)

Body:
@prefix memento: <http://mementoweb.org/ns#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix fedora: <http://fedora.info/definitions/v4/repository#> .
@prefix ldp: <http://www.w3.org/ns/ldp#> .

<http://localhost:8080/rest/collection>
  rdf:type fedora:Container ;
  rdf:type fedora:Resource ;
  rdf:type ldp:BasicContainer ;
  fedora:lastModifiedBy "fedoraAdmin" ;
  fedora:created "2018-10-12T23:24:34.2862"^^<http://www.w3.org/2001/XMLSchema#dateTime> ;
  fedora:created "2018-10-12T23:24:34.2862"^^<http://www.w3.org/2001/XMLSchema#dateTime> ;
  rdf:type ldp:RDFSource ;
  rdf:type ldp:Container ;
  fedora:writable true .


<http://localhost:8080/rest/item>
  ldp:isMemberOfCollection <http://localhost:8080/rest/collection> .

Example (4): Non-RDF Source

```
curl "http://localhost:8080/rest/path/to/binary/resource"
```

Response:
POST Create new resources within a LDP container

Request Headers:

- **CONTENT-DISPOSITION** (Optional) The filename provided in the content disposition header will be stored in a ebucore:filename property. (See 'Example (6): Uploaded file with filename')

- **CONTENT-TYPE** (Optional) MIME type of the uploaded binary or RDF content (See 'Example (2): Create a new child binary resource with empty content')

- **SLUG** (Optional) A suggested name for the new child resource, which the repository may ignore.

- **DIGEST** (Optional) A way of providing one or more checksums (SHA-1, SHA-256, MD5) which will be checked against the uploaded content to ensure error-free transfer. The header is interpreted according to RFC-3230. If the provided checksum does not match the calculated value for the uploaded file a 409 Conflict will be returned. See PATC H example for documentation on how to change the default algorithm used during on-demand fixity checking. Valid `Digest` algorithms/values are: sha, sha-256, or md5.

- **LINK** With a value containing subfield rel= http://fedora.info/definitions/fcrepo#ExternalContent the client may provide binary content from an external path. See the external content documentation for details about syntax and handling options (note, this is disabled by default), and Example 7 for usage.

**Example (1): Create a new child node**

```
curl -X POST "http://localhost:8080/rest/"
```

Response:
Example (2): Create a new child binary resource with empty content

```
curl -i -X POST -H "Content-Type: text/plain" "http://localhost:8080/rest"
```

Response:

```
Status: 201 Created
ETag: "487f188240d2be3ae32d49958c0e0ea18224bea0a"
Last-Modified: Thu, 29 May 2014 15:46:13 GMT
Link: <http://localhost:8080/rest/b8/fc/32/be/b8fc32be-34be-428e-bf7c-81be97e5f2e3/fcr:metadata>; rel="describedby"; anchor="http://localhost:8080/rest/b8/fc/32/be/b8fc32be-34be-428e-bf7c-81be97e5f2e3"
Location: http://localhost:8080/rest/b8/fc/32/be/b8fc32be-34be-428e-bf7c-81be97e5f2e3
Content-Type: text/plain
Transfer-Encoding: chunked

Body:
http://localhost:8080/rest/b8/fc/32/be/b8fc32be-34be-428e-bf7c-81be97e5f2e3
```

Example (3): Create a new container with RDF properties

```
curl -i -X POST -H "Content-Type: text/turtle" --data-binary @body.rdf "http://localhost:8080/rest/"
```

Request Body:

```
PREFIX dc: <http://purl.org/dc/elements/1.1/>
<> dc:title "some-resource-title"
```

Response:

```
Status: 201 Created
ETag: "a66937ca13bc29c63f7b1a55d447a76cd8f1d573"
Location: http://localhost:8080/rest/new/node/uri

Body:
http://localhost:8080/rest/new/node/uri
```

Example (4): Uploaded file with checksum

```
curl -i -X POST --data-binary @picture.jpg -H "digest: sha=cb1a576f22e8e3e110611b616e3e2f5ce9bcb941" "http://localhost:8080/rest/parent/container"
```

Response:
Example (4b): Uploaded file with multiple checksum

```
curl -i -X POST --data-binary @picture.jpg -H "digest: sha=cb1a576f22e8e3e1l0611b616e3e2f5ce9bd941, sha-256=95331b60710d0400ee4913b5613c78f54" "http://localhost:8080/rest/parent/container"
```

Response:

<table>
<thead>
<tr>
<th>Status: 201 Created</th>
<th>Headers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETag: &quot;fe4e2bf389fe05dab6390564e40012d82d6eca19&quot;</td>
<td></td>
</tr>
<tr>
<td>Location: <a href="http://localhost:8080/rest/parent/object/auto/generated/ds/id">http://localhost:8080/rest/parent/object/auto/generated/ds/id</a></td>
<td></td>
</tr>
<tr>
<td>Body: <a href="http://localhost:8080/rest/parent/object/auto/generated/ds/id">http://localhost:8080/rest/parent/object/auto/generated/ds/id</a></td>
<td></td>
</tr>
</tbody>
</table>

Example (5): Uploaded file with checksum mismatch

```
curl -X POST --data-binary @picture.jpg -H "digest: sha=checksumdoesntmatch" "http://localhost:8080/rest/parent/object"
```

Response:

<table>
<thead>
<tr>
<th>Status: 409 Conflict</th>
<th>Body:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checksum Mismatch of cb1a576f22e8e3e1l0611b616e3e2f5ce9bd941 and urn:sha1:checksumdoesntmatch</td>
<td></td>
</tr>
</tbody>
</table>

Example (6): Uploaded file with filename

```
curl -i -X POST --data-binary @picture.jpg -H "Content-Disposition: attachment; filename="picture.jpg"" "http://localhost:8080/rest/parent/container"
```

Response:

<table>
<thead>
<tr>
<th>Status: 201 Created</th>
<th>Headers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETag: &quot;fe4e2bf389fe05dab6390564e40012d82d6eca19&quot;</td>
<td></td>
</tr>
<tr>
<td>Location: <a href="http://localhost:8080/rest/parent/object/auto/generated/ds/id">http://localhost:8080/rest/parent/object/auto/generated/ds/id</a></td>
<td></td>
</tr>
<tr>
<td>Body: <a href="http://localhost:8080/rest/parent/object/auto/generated/ds/id">http://localhost:8080/rest/parent/object/auto/generated/ds/id</a></td>
<td></td>
</tr>
</tbody>
</table>
Example (7): Creating a new binary resource using proxied external content

curl -i -X POST -H"Link: <file:///path/to/picture.jpg>; rel="http://fedora.info/definitions/fcrepo#ExternalContent"; handling="proxy"; type="image/jpg"" "http://localhost:8080/rest/parent/container"

Response:

Status: 201 Created

Headers:
ETag: "fe4e2bf389fe05dab6390564e40012d8d36eca19"
Location: http://localhost:8080/rest/parent/container/<autogenerated-ds-id>

Body:
http://localhost:8080/rest/parent/container/<autogenerated-ds-id>

Status:

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>Created</td>
</tr>
<tr>
<td>404</td>
<td>Not Found (resource does not exist – use PUT to specify a new resource name)</td>
</tr>
<tr>
<td>409</td>
<td>Conflict (checksum mismatch)</td>
</tr>
</tbody>
</table>

PUT Create a resource with a specified path, or replace the triples associated with a resource with the triples provided in the request body.

Some resource properties are repository managed and cannot be removed or modified. Any attempt to do so may result in a 4xx error.

RDF will be interpreted using the current resource as the base URI (e.g. <> will be expanded to the current URI)

Request Headers:

<table>
<thead>
<tr>
<th>header</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTENT-TYPE</td>
<td>text/turtle, text/rdf+n3, application/n3, text/n3, application/rdf+xml, application/n-triples, text/html, text/plain, application/id+json</td>
</tr>
<tr>
<td>IF-MATCH</td>
<td></td>
</tr>
<tr>
<td>IF-UNMODIFIED-SINCE</td>
<td></td>
</tr>
<tr>
<td>DIGEST</td>
<td>(Optional) A way of providing one or more checksums (SHA-1, SHA-256, MD5) which will be checked against the uploaded content to ensure error-free transfer. The header is interpreted according to RFC-3230. (See Example (3): Creating new binary resource at a specified path) If the provided checksum does not match the calculated value for the uploaded file a 409 Conflict will be returned. See Fixity Service for documentation on how to change the default algorithm used during on-demand fixity checking. Valid ‘Digest’ algorithms/values are: sha, sha-256, or md5.</td>
</tr>
<tr>
<td>PREFER</td>
<td>With the value handling=lenient; received=&quot;minimal&quot; allows replacing the properties of a container without having to provide all of the server-managed triples.</td>
</tr>
<tr>
<td>LINK</td>
<td>With a value containing subfield rel=<a href="http://fedora.info/definitions/fcrepo#ExternalContent">http://fedora.info/definitions/fcrepo#ExternalContent</a> the client may provide binary content from an external path. See the external content documentation for details about syntax and handling options (note, this is disabled by default), and Example 4 for usage.</td>
</tr>
</tbody>
</table>
Example (1): Updating properties with RDF content

1.1 Perform a GET to the current container's RDF content

```
```

Body:
PREFIX dc: <http://purl.org/dc/elements/1.1/>

```
PREFIX ldp: <http://www.w3.org/ns/ldp#>
```

```
fcrepo:primaryType "nt:folder"^^<http://www.w3.org/2001/XMLSchema#string> ;
```

```
```

1.2 Add your updates (e.g. `<> dc:title "some-resource-title" .`) under the full result of the GET response in 1.1

```
```

Request Body:
PREFIX dc: <http://purl.org/dc/elements/1.1/>

```
PREFIX ldp: <http://www.w3.org/ns/ldp#>
```

```
fcrepo:primaryType "nt:folder"^^<http://www.w3.org/2001/XMLSchema#string> ;
```

```
```

```
<> dc:title "some-resource-title" .
```

Response:

```
Status: 204 No Content
```

Note that to prevent conflicts, the value of the fedora:lastModified triple in the request must match its current counterpart in the repository. The way to ensure this is to base the changes in a PUT request on the RDF content obtained in an immediately prior GET request, and never try to PUT consecutively, as this will result in a 400 error.

Example (2): Creating a new resource at a specified path
curl -i -X PUT "http://localhost:8080/rest/node/to/create"

Response:

Status: 201 Created

Response Headers:
ETag: "ef214795c3b9109389ffaf542a6c081976e1e9587"
Last-Modified: Mon, 19 May 2014 20:52:57 GMT
Location: http://localhost:8080/rest/node/to/create

Body:
http://localhost:8080/rest/node/to/create

Example (3): Creating new binary resource at a specified path

```
curl -X PUT --upload-file image.jpg -H"Content-Type: image/jpeg" -H"digest: sha=c1a576f22e8e3e110611b616e3e2f5ce9b7b941" "http://localhost:8080/rest/new/image"
```

Response:

Status: 201 Created

Headers:
ETag: "urn:sha1:ea3d29b28522724a82de042a7b7a4e79a1653435"
Last-Modified: Mon, 19 May 2014 20:55:31 GMT
Location: http://localhost:8080/rest/new/image

Body:
http://localhost:8080/rest/new/image

Note that once a resource is created as an RDF or non-RDF source, it must remain an RDF or non-RDF source. In order to change the type of resource, you must DELETE and then re-create the resource.

Status:

- 204 No Content
- 412 Precondition Failed

Example (4): Creating a new binary resource at a specified path redirecting to external content

```
curl -X PUT -H*Link: <http://www.example.com/file>; rel="http://fedora.info/definitions/fcrepo#ExternalContent"; handling="redirect"; type="text/plain"" "http://localhost:8080/rest/node/to/create"
```

Response:
PATCH Modify the triples associated with a resource with SPARQL-Update

Request Headers:
- Content-Type: application/sparql-update

Example (1):

curl -X PATCH -H "Content-Type: application/sparql-update" --data-binary @body.rdf http://localhost:8080/rest/node/to/update

Request Body:

```sparql
PREFIX dc: <http://purl.org/dc/elements/1.1/>
INSERT {
  <> dc:title "some-resource-title" .
}
WHERE { }
```

Response:

Status: 204 No Content

Example (2) Update default fixity algorithm of a binary's description:


Request Body:

```sparql
PREFIX fedoraconfig: <http://fedora.info/definitions/v4/config#>
INSERT {
  <> fedoraconfig:defaultDigestAlgorithm "sha-256"
}
WHERE { }
```

Response:

Status: 204 No Content
Delete a resource

Example:

curl -X DELETE "http://localhost:8080/rest/resource/to/delete"

Response:

Status: 204 No Content

Delete requests create "tombstone" resources which need to be removed before you can reuse a URI.

Example:

curl -X GET "http://localhost:8080/rest/some/deleted/resource"

Status: 410 Gone
Link: <http://localhost:8080/rest/some/deleted/resource/fcr:tombstone>; rel="hasTombstone"

Body:
Discovered tombstone resource at /some/deleted/resource, departed: 2016-11-14T17:26:17.334-06:00

curl -X DELETE "http://localhost:8080/rest/some/deleted/resource/fcr:tombstone"

Status: 204 No Content

Create a new node and reuse the deleted URL

curl -X PUT "http://localhost:8080/rest/some/deleted/resource"

Status: 201 Created
Example:

curl -i -X HEAD "http://localhost:8080/rest/resource/to/head"

Response:

Status: 200 OK
ETag: "bbdd92e395800153a686773f773b3c80a51f47b"
Last-Modified: Wed, 28 May 2014 18:31:36 GMT
Last-Modified: Thu, 20 Nov 2014 15:44:32 GMT
Link: <http://www.w3.org/ns/ldp#Resource>;rel="type"
Link: <http://www.w3.org/ns/ldp#Container>;rel="type"
Link: <http://www.w3.org/ns/ldp#BasicContainer>;rel="type"
Accept-Patch: application/sparql-update
Allow: MOVE,COPY,DELETE,POST,HEAD,GET,PUT,PATCH,OPTIONS

Status:

200 OK
404 Not Found

OPTIONS Outputs information about the supported HTTP methods, etc.
Example:

curl -i -X OPTIONS "http://localhost:8080/rest/node/to/options"

Response:

Status: 200 OK
Accept-Patch: application/sparql-update
Allow: MOVE,COPY,DELETE,POST,HEAD,GET,PUT,PATCH,OPTIONS
Accept-Post: text/turtle,text/rdf+n3,text/n3,application/rdf+xml,application/n-triples,multipart/form-data,application/sparql-update

Status:

200 OK

MOVE Move a resource (and its subtree) to a new location

NOTE: The MOVE action has been deprecated and will be removed in a future version of Fedora.

Note: A federated resource can be moved within the federation, but not from the federation to the internal repository (or vice versa)

Example (1):

Response:

```
Status: 201 Created
Headers:
Location: http://localhost:8080/rest/new/path/to/resource
```

Example (2):

```
curl -X MOVE "http://localhost:8080/rest/path/to/resource"
```

Response:

```
Status: 502 Bad Gateway
```

### Status:

- **201** Created
- **409** Source path doesn't exist
- **412** Destination path already exists
- **502** Destination URI isn't a valid resource path

---

**COPY**

Copy a resource (and its subtree) to a new location

**NOTE:** The COPY action has been deprecated and will be removed in a future version of Fedora.

Example:

```
```

Response:

```
Status: 201 Created
Headers:
Location: http://localhost:8080/rest/new/path/to/resource
```

### Status:

- **201** Created
- **409** Source path doesn't exist
- **412** Destination path already exists
- **502** Destination URI isn't a valid resource path