OASIS OPEN PROJECTS

OSLC Core Version 3.0. Part 5: Attachments

OASIS Standard
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This stage:

https://docs.oasis-open-projects.org/oslc-op/core/v3.0/os/attachments.html (Authoritative)
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Previous stage:

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OASIS Open Services for Lifecycle Collaboration (OSLC) OP

Project Chairs:

Jim Amsden (jamsden@us.ibm.com), IBM
Andrii Berezovskyi (andriib@kth.se), KTH

Editor:

Jim Amsden (jamsden@us.ibm.com), IBM

Additional components:

This specification is one component of a Work Product that also includes:

- *OSLC Core Version 3.0. Part 1: Overview*. https://docs.oasis-open-projects.org/oslc-op/core/v3.0/os/oslc-core.html
- *OSLC Core Version 3.0. Part 2: Discovery*. https://docs.oasis-open-projects.org/oslc-op/core/v3.0/os/discovery.html
- *OSLC Core Version 3.0. Part 3: Resource Preview*. https://docs.oasis-open-projects.org/oslc-op/core/v3.0/os/resource-preview.html
- *OSLC Core Version 3.0. Part 4: Delegated Dialogs*. https://docs.oasis-open-projects.org/oslc-op/core/v3.0/os/dialogs.html
- *OSLC Core Version 3.0. Part 5: Attachments (this document)*. https://docs.oasis-open-projects.org/oslc-op/core/v3.0/os/attachments.html
- *OSLC Core Version 3.0. Part 6: Resource Shape*. https://docs.oasis-open-projects.org/oslc-op/core/v3.0/os/resource-shape.html
- *OSLC Core Version 3.0. Part 7: Vocabulary*. https://docs.oasis-open-projects.org/oslc-op/core/v3.0/os/core-vocab.html
- *OSLC Core Version 3.0. Part 8: Constraints*. https://docs.oasis-open-projects.org/oslc-op/core/v3.0/os/core-shapes.html
- *OSLC Core Version 3.0. Machine Readable Vocabulary Terms*. https://docs.oasis-open-projects.org/oslc-op/core/v3.0/os/core-vocab.ttl
- *OSLC Core Version 3.0. Machine Readable Constraints*. https://docs.oasis-open-projects.org/oslc-op/core/v3.0/os/core-shapes.ttl

Related work:

This specification is related to:

- *OSLC Core Version 3.0: Link Guidance*. https://oslc-op.github.io/oslc-specs/notes/link-guidance.html

RDF Namespaces:

http://open-services.net/ns/core#

Abstract:

Binary or text documents may be considered attachments to other resources. This specification describes a minimal way to manage attachments related to web resources using LDP-Containers and Non-RDF Source [LDP].

Status:

This document was last revised or approved by the membership of OASIS on the above date. The level of approval is also listed above. Check the "Latest stage" location noted above for possible later revisions of this document. Any other numbered Versions and other technical work produced by the Open Project are listed at https://open-services.net/about/.

Comments on this work can be provided by opening issues in the project repository or by sending email to the project's public comment list oslc-op@lists.oasis-open-projects.org.

The English version of this specification is the only normative version. Non-normative translations may also be available. Note that any machine-readable content (Computer Language Definitions) declared Normative for this Work Product is provided in separate plain text files. In the event of a discrepancy between any such plain text file and display content in the Work Product's prose narrative document(s), the content in the separate plain text file prevails.

Citation format:

When referencing this specification the following citation format should be used:
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Notices

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1. Introduction

This section is non-normative.

Various tools handle the association and creation of related resources in conceptually similar ways, but often differ in details on how it is accomplished. The Linked Data Platform (LDP) already defines a model by which it is possible to relate resources to another, even if they are not RDF-based. This specification defines the method to create associated attachments to a given resource and understand if that resource supports the attaching of attachments.

As an example of how to create an attachment, simply HTTP POST the attachment content to the attachment container for the resource. The request should have a `Content-Type` header describing the attachment's media type. The optional `Slug` header is used to give the attachment a name.

EXAMPLE 1

```
POST /bugs/2314/attachments HTTP/1.1
Slug: design
Content-Type: application/vnd.oasis.opendocument.text
Content-Length: 18124

[binary content]
```

The response contains a Link to the new attachment in the `Location` header. This server has also included a Link to the `oslc:AttachmentDescriptor` for the attachment in the HTTP response, which contains metadata about the attachment.

EXAMPLE 2

```
HTTP/1.1 201 Created
Allow: GET,HEAD,OPTIONS,POST
Location: http://example.com/bugs/2314/attachments/3
Link: <http://example.com/bugs/2314/attachments/meta/3>; rel="describedby"; anchor="http://example.com/bugs/2314/attachments/3",
      <http://www.w3.org/ns/ldp#Resource>; rel="type"
Content-Length: 0
```

The following sections detail how to leverage LDP to accomplish the ways in which to discovery, get, create, update or delete attachments and associate with a web resource.

1.1 Terminology

Terminology uses and extends the terminology and capabilities of OSLC Core Overview, W3C Linked Data Platform [LDP], W3C's Architecture of the World Wide Web [WEBARCH], Hyper-text Transfer Protocol [HTTP11].

Attachment

A LDP-NR whose lifecycle is coupled with the attaching resource.

Attachment Container

A LDPC that contains Attachments for a resource.

Attachment Descriptor

A LDP-RS that contains additional data about an Attachment.

1.2 References

1.2.1 Normative references

[HTTP11]

R. Fielding, Ed.; J. Reschke, Ed.. *Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing*. IETF, June 2014. Proposed Standard. URL: https://httpwg.org/specs/rfc7230.html

[LDP]

Steve Speicher; John Arwe; Ashok Malhotra. *Linked Data Platform 1.0*. W3C, 26 February 2015. W3C Recommendation. URL: https://www.w3.org/TR/ldp/

[PURLMediaTypes]

N. Freed; M. Kucherawy; M. Baker; B. Hoehrmann. *Media Types*. IANA. URL: http://www.iana.org/assignments/media-types/media-types.xhtml

[RFC2119]

S. Bradner. *Key words for use in RFCs to Indicate Requirement Levels*. IETF, March 1997. Best Current Practice. URL: https://www.rfc-editor.org/rfc/rfc2119

[RFC2183]

R. Troost; S. Dorner; K. Moore, Ed.. *Communicating Presentation Information in Internet Messages: The Content-Disposition Header Field*. IETF, August 1997. Proposed Standard. URL: https://www.rfc-editor.org/rfc/rfc2183

[RFC5023]

J. Gregorio, Ed.; B. de hOra, Ed.. *The Atom Publishing Protocol*. IETF, October 2007. Proposed Standard. URL: https://www.rfc-editor.org/rfc/rfc5023

[RFC8174]

B. Leiba. *Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words*. IETF, May 2017. Best Current Practice. URL: https://www.rfc-editor.org/rfc/rfc8174

[RFC8288]

M. Nottingham. *Web Linking*. IETF, October 2017. Proposed Standard. URL: https://httpwg.org/specs/rfc8288.html

[turtle]

Eric Prud'hommeaux; Gavin Carothers. *RDF 1.1 Turtle*. W3C, 25 February 2014. W3C Recommendation. URL: https://www.w3.org/TR/turtle/

1.2.2 Informative references

[WEBARCH]

Ian Jacobs; Norman Walsh. *Architecture of the World Wide Web, Volume One*. W3C, 15 December 2004. W3C Recommendation. URL: https://www.w3.org/TR/webarch/

1.3 Typographical Conventions and Use of RFC Terms

As well as sections marked as non-normative, all authoring guidelines, diagrams, examples, and notes in this specification are non-normative. Everything else in this specification is normative.

The key words "**MUST**", "**MUST NOT**", "**REQUIRED**", "**SHALL**", "**SHALL NOT**", "**SHOULD**", "**SHOULD NOT**", "**RECOMMENDED**", "**NOT RECOMMENDED**", "**MAY**", and "**OPTIONAL**" in this specification are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

The namespace for OSLC Core is `http://open-services.net/ns/core#`.

Sample resource representations are provided in `text/turtle` format [turtle].

Commonly used namespace prefixes:

```
@prefix dcterms: <http://purl.org/dc/terms/>.
@prefix ldp:     <http://www.w3.org/ns/ldp#>.
@prefix oslc:    <http://open-services.net/ns/core#>.
@prefix oslc_cm: <http://open-services.net/ns/cm#>.
@prefix rdf:     <http://www.w3.org/1999/02/22-rdf-syntax-ns#>.
@prefix wdrs:    <http://www.w3.org/2007/05/powder-s#> .
@prefix xsd:     <http://www.w3.org/2001/XMLSchema#>.
```


2. Motivation

This section is non-normative.

Most users of lifecycle tools have the need to easily create attachments across a variety of integrated tools and associate them to some lifecycle resource in context to some scenario. Some specific scenarios where this touches cross tool integration:

- **Running application scanning** : automatically creating a defect or task to track a problem, attaching a log file that outlines the details of the problem.
- **Publishing build results** : as part of an automated software build, publish successful build artifacts to an asset management repository
- **Mockups of app design** : share screenshots and designs to a given user story (requirement)

3. Basic Concepts

This section is non-normative.

Attachments are added to a resource via a simple POST request to the appropriate LDP-Container resource. The entity body becomes the content of the attachment resource. The attachment may automatically be associated with the resource via some membership relationship, which may use the `oslc:attachment` membership predicate. Statements are also automatically added to the `oslc:AttachmentDescriptor` resource. The property values are assigned by the server or can be determined from standard headers of the POST. The following table maps the HTTP request headers from the POST request to create the attachment resource, to what can be used to derive the initial values in the indicated `oslc:AttachmentDescriptor` resource:

HTTP Request Header	Prefixed Name
`Slug`	`dcterms:title`
`Content-Type`	`dcterms:format`
`Content-Length`	`oslc:attachmentSize`

4. Working with Attachments

This section is non-normative.

The following examples illustrate how a client can work with attachments.

4.1 Find the Attachments for a Resource

Clients get the attachments for a resource by:

1. Finding the attachment container for a resource using an HTTP OPTIONS method and Link header
2. Getting the container for the list of attachments

Each resource that supports attachments has an attachment container, which is an LDP container. Clients discover the attachment container through an HTTP Link header. A client can use GET or HEAD to get the Link header, but OPTIONS is often more efficient because the server does not have to calculate the ETag or content length of the response. LDP resources must support HTTP OPTIONS, and responses to all HTTP requests for resources that support attachments must have the Link header.

EXAMPLE 3

```
OPTIONS /bugs/2314 HTTP/1.1
Host: example.com
```

The response contains a Link to the attachment container with Link relation `http://open-services.net/ns/core#AttachmentContainer`. Note that other Link headers are in the response. In fact, LDP requires additional Link headers, which is why the response has a Link with relation `type` and target URI `http://www.w3.org/ns/ldp#Resource`.

EXAMPLE 4

```
HTTP/1.1 200 OK
Allow: GET,HEAD,OPTIONS,PUT,DELETE
Link: <http://www.w3.org/ns/ldp#Resource>; rel="type",
      <http://example.com/bugs/2314/attachments>; rel="http://open-services.net/ns/core#AttachmentContainer"
```

Now the client requests the attachment container to see the attachments for this resource. It's a good practice to include an HTTP `Prefer` header to explicitly ask the server for the LDP containment triples.

EXAMPLE 5

```
GET /bugs/2314/attachments HTTP/1.1
Host: example.com
Accept: text/turtle
Prefer: return=representation; include="http://www.w3.org/ns/ldp#PreferContainment"
```

The response is an LDP container for the attachments. It can be any LDP container such as an `ldp:BasicContainer` or an `ldp:DirectContainer`. This example uses an `ldp:BasicContainer`. The attachment container only contains attachments for a single resource.

EXAMPLE 6

```
HTTP/1.1 200 OK
Allow: GET,HEAD,OPTIONS,POST
Content-Length: 323
Content-Type: text/turtle
ETag: W/"2773fef2237e91273bde782a43925458"
Link: <http://www.w3.org/ns/ldp#Resource>; rel="type",
      <http://www.w3.org/ns/ldp#Container>; rel="type",
Preference-Applied: return=representation
Vary: Accept,Prefer

@prefix oslc: <http://open-services.net/ns/core#> .
@prefix ldp:   <http://w3.org/ns/ldp#> .

<http://example.com/bugs/2314/attachments>
        a             oslc:AttachmentContainer , ldp:BasicContainer ;
        ldp:contains  <http://example.com/bugs/2314/attachments/2> , <http://example.com/bugs/2314/attachments/1> .
```


Clients can look at the `ldp:contains` property on the container for the attachments.

4.2 Get the Attachment Content

Once clients have the attachment URI, they can get the attachment by simply making an HTTP GET request to the attachment URI.

A `Slug` header can be included by a server in the response to a `GET` on an attachment resource. If a client wishes to store the content as a file, this value provides a hint as to the file name to use (subject, of course, to any file system restrictions). In the absence of an `Slug` header, the client may use the last segment of the resource's URI as a hint, or just choose an arbitrary file name.

EXAMPLE 7

```
GET /bugs/2314/attachments/1 HTTP/1.1
Host: example.com
```

The response body is the attachment content. Servers should set the response `Content-Type` to describe the media type of the attachment. The response may have a `Content-Disposition` header with a filename parameter, although this isn't required. This example also contains a Link with relation `describedby`, which links to the `oslc:AttachmentDescriptor` for the attachment.

EXAMPLE 8

```
HTTP/1.1 200 OK
Allow: GET,HEAD,OPTIONS,PUT,DELETE
Content-Disposition: attachment; filename="screenshot.png"
Content-Length: 53622
Content-Type: image/png
ETag: W/"678609cdee68e0fb8aea5f252b84a511"
Link: <http://example.com/bugs/2314/attachments/meta/1>; rel="describedby",
      <http://www.w3.org/ns/ldp#Resource>; rel="type",
      <http://www.w3.org/ns/ldp#NonRDFSource>; rel="type"

[binary content]
```

4.3 Create an Attachment

To create an attachment, POST the attachment content to the attachment container for the resource. The request should have a `Content-Type` header describing the attachment's media type and subtype as specified in Media Types. The optional `Slug` header is used to give the attachment a name. The `Content-Length` header is used to initialize the attachment size.

A client can set a `Slug` header in the attachment-creating POST to specify a hint for a name for the resource as part of that single request. This can be important as some systems require a name at the time the attachment is created. Different systems may have different requirements for valid attachment names, so the value of the `Slug` header should be interpreted as a hint in this context. If the given name can not be used as specified, it is transformed into a valid name. If that is not possible or the header is not specified, an arbitrary value is assigned. Failure due to an invalid name is undesirable because of the potentially large size of an attachment resource.

The client can provide the attachment size in the `Content-Length` header and this can be used to initialize the `oslc:AttachmentDescriptor` `oslc:attachmentSize` property. The server may compute a different attachment size than that provided by the client if the client specified value is incorrect or not provided.

EXAMPLE 9

```
POST /bugs/2314/attachments HTTP/1.1
Slug: design
Content-Type: application/vnd.oasis.opendocument.text
Content-Length: 18124

[binary content]
```

The response contains a Link to the new attachment in the `Location` header. This server has also included a Link to the `oslc:AttachmentDescriptor` for the attachment in the HTTP response, which contains metadata about the attachment.

When a server successfully creates an attachment resource, it responds with an HTTP status code of 201 (created) with the URI of the newly created attachment resource in the HTTP response `Location` header. Additionally, if the server created an associated `oslc:AttachmentDescriptor` resource, the URI for this resource should be listed in the HTTP response `Link` header [RFC8288] with `rel="describedby"` [LDP].

Properties for the AttachmentDescriptor that are not readOnly, such as its title and description, can be updated using the usual HTTP `PUT` method.

EXAMPLE 10


```
HTTP/1.1 201 Created
Allow: GET,HEAD,OPTIONS,POST
Location: http://example.com/bugs/2314/attachments/3
Link: <http://example.com/bugs/2314/attachments/meta/3>; rel="describedby"; anchor="http://example.com/bugs/2314/attachments/3",
      <http://www.w3.org/ns/ldp#Resource>; rel="type"
Content-Length: 0
```

4.4 Update an Attachment

To update an attachment, PUT the attachment content to the attachment resource.

EXAMPLE 11

```
PUT /bugs/2314/attachments/3 HTTP/1.1
Content-Type: application/vnd.oasis.opendocument.text
Content-Length: 19377

[binary content]
```

The server typically responds with a 204 No Content status if the request succeeds. It also updates an associated attachment metadata in the **`oslc:AttachmentDescriptor`** in the **`describedby`** link. For example, the client could have included a **`Slug`** header on the update request in order to rename the attachment.

EXAMPLE 12

```
HTTP/1.1 204 No Content
Link: <http://example.com/bugs/2314/attachments/meta/3>; rel="describedby"; anchor="http://example.com/bugs/2314/attachments/3",
      <http://www.w3.org/ns/ldp#Resource>; rel="type"
Content-Length: 0
```

4.5 Remove an Attachment

To remove an attachment, make a DELETE request on the attachment URI. This removes the attachment from the container and deletes the content and attachment metadata from the server.

EXAMPLE 13

```
DELETE /bugs/2314/attachments/3 HTTP/1.1
Host: example.com
```

The server typically responds with 204 No Content status if the request was successful.

EXAMPLE 14

```
HTTP/1.1 204 No Content
Content-Length: 0
```

4.6 Include Attachment Information Inline with a Resource

Servers can choose to include the attachment information directly in the HTTP response for a resource although this isn't required. Here is an example defect resource that contains attachments. The attachment container is an **`ldp:DirectContainer`** where the membership resource is the defect itself. The membership predicate is **`oslc:attachment`**, although this predicate is not required. The following example shows the results of an **`HTTP GET`** on **`http://example.com/bugs/2314`**.

EXAMPLE 15

```
@prefix oslc:     <http://open-services.net/ns/core#> .
@prefix oslc_cm:  <http://open-services.net/ns/cm#> .
@prefix dcterms:  <http://purl.org/dc/terms/> .
@prefix ldp:      <http://w3.org/ns/ldp#> .
@prefix wdrs:  <http://www.w3.org/2007/05/powder-s#> .

<http://example.com/bugs/2314>
        a                   oslc_cm:Defect ;
        oslc:attachment     <http://example.com/bugs/2314/attachments/2> , <http://example.com/bugs/2314/attachments/1> ;
        dcterms:title       "A serious bug!" ;
        dcterms:identifier  "2314" .
```



```
<http://example.com/bugs/2314/attachments>
        a                       ldp:DirectContainer , oslc:AttachmentContainer ;
        ldp:contains            <http://example.com/bugs/2314/attachments/2> , <http://example.com/bugs/2314/attachments/1> ;
        ldp:hasMemberRelation   oslc:attachment ;
        ldp:membershipResource  <http://example.com/bugs/2314> .

<http://example.com/bugs/2314/attachments/1>
        wdrs:describedBy  <http://example.com/bugs/2314/attachments/meta/1> .

<http://example.com/bugs/2314/attachments/meta/1>
        a                       oslc:AttachmentDescriptor ;
        oslc:attachmentSize     "53622"^^<http://www.w3.org/2001/XMLSchema#integer> ;
        dcterms:created         "2011-07-18T13:22:30.45-05:00"^^<http://www.w3.org/2001/XMLSchema#dateTime> ;
        dcterms:creator         <http://example.com/users/steve> ;
        dcterms:format          <http://purl.org/NET/mediatypes/image/png> ;
        dcterms:identifier      "1" ;
        dcterms:title           "screenshot.png" .

<http://example.com/bugs/2314/attachments/2>
        wdrs:describedBy  <http://example.com/bugs/2314/attachments/meta/2> .

<http://example.com/bugs/2314/attachments/meta/2>
        a                       oslc:AttachmentDescriptor ;
        oslc:attachmentSize     "9196"^^<http://www.w3.org/2001/XMLSchema#int> ;
        dcterms:created         "2011-07-19T15:03:54.00-05:00"^^<http://www.w3.org/2001/XMLSchema#dateTime> ;
        dcterms:creator         <http://example.com/users/dave> ;
        dcterms:format          <http://purl.org/NET/mediatypes/text/x-diff> ;
        dcterms:identifier      "2" ;
        dcterms:title           "fix.patch" .
```


5. Implementation Conformance

5.1 General

Servers that support OSLC attachments **MUST** be Linked Data Platform 1.0 conformant servers [LDP]. [at-1]

5.2 Resources with Attachments

Each resource that supports attachments **MUST** have at least one `oslc:AttachmentContainer` that holds attachments for that resource. [at-2]

Responses to HTTP requests for resources that support attachments **MUST** contain at least one Link header [RFC8288] where the context URI is the resource URI, the Link relation is `http://open-services.net/ns/core#AttachmentContainer`, and the target URI is the URI of an `oslc:AttachmentContainer` resource. [at-3]

5.3 Attachments

An attachment **MUST** be a conformant Linked Data Platform Non-RDF Source (LDP-NR). [at-4]

Successful responses to HTTP GET requests for an attachment URI **SHOULD** include a `Content-Disposition` header [RFC2183] with disposition type `attachment` and a filename parameter. The filename is often the `Slug` header value used to create the attachment with an appropriate file extension added for the attachment's media type. [at-5]

If an attachment has an associated `oslc:AttachmentDescriptor`, responses to HTTP requests for the attachment URI **MUST** include a Link header [RFC8288] where the context URI is the attachment URI, the Link relation is `describedby`, and the target URI is the URI of the `oslc:AttachmentDescriptor`. [at-6]

When servers update an attachment, they **MUST** also update any affected `oslc:AttachmentDescriptor` properties of the associated attachment descriptor. [at-7]

When deleting attachments, servers **MUST** also delete any associated `oslc:AttachmentDescriptor` resources. [at-8]

5.4 Attachment Containers

Each `oslc:AttachmentContainer` **MUST** be a conformant Linked Data Platform Container (LDPC). [at-9]

Clients **MAY** use the HTTP `Slug` request header [RFC5023] to suggest a name when creating an attachment. If present, the `Slug` header **SHOULD NOT** include a file extension. [at-10]

Servers **SHOULD NOT** reject an HTTP POST request to an `oslc:AttachmentContainer` solely because it does not contain a `Slug` header. [at-11]

Servers **SHOULD NOT** reject an an HTTP POST request to an `oslc:AttachmentContainer` solely because they cannot use the `Slug` value unchanged. Servers **SHOULD** instead modify the `Slug` value as needed or assign a different name. [at-12]

In response to a successful HTTP POST request that creates an attachment with an associated `oslc:AttachmentDescriptor`, the server **MUST** include an HTTP Link header in the response where the context URI is the newly-created attachment URI, the link relation is `describedby`, and the link target is the `oslc:AttachmentDescriptor` URI. [at-13]

Clients **MAY** specify an LDP-NR interaction model when POSTing RDF content to an `oslc:AttachmentContainer` by including an HTTP Link header where the target URI is `http://www.w3.org/ns/ldp#NonRDFSource` and the link relation is `type`. In this case, Servers **MUST** honor the client's requested interaction model and treat the resource as an LDP-NR. [at-14]

Servers **MUST** reject an HTTP DELETE request to an `oslc:AttachmentContainer`. [at-15]

5.5 Attachment Descriptors

Servers **MAY** create an associated `oslc:AttachmentDescriptor` to describe properties of the attachment such as its name, media type, and size. [at-16]

An `oslc:AttachmentDescriptor` **MUST** have an explicit `rdf:type` set to `http://open-services.net/ns/core#AttachmentDescriptor` in its RDF representations. It **MAY** have additional `rdf:type` values. [at-17]

An `oslc:AttachmentDescriptor` **MUST** be a conforming Linked Data Platform RDF Source (LDPR). [at-18]

The `dcterms:title` of the `oslc:AttachmentDescriptor` **SHOULD** be the value of the client-supplied HTTP `Slug` header. [at-19]

Servers **SHOULD** use the `Content-Type` header value from an attachment creation request to determine the `dcterms:format` property value in the newly-created attachment's `oslc:AttachmentDescriptor`. The `dcterms:format` value **SHOULD** be a [PURLMediaTypes] media-type resource. [at-20]

An `oslc:AttachmentDescriptor` **MUST** conform to the shape defined in 6.1 Resource: AttachmentDescriptor. [at-21]

6. Resource Constraints

6.1 Resource: AttachmentDescriptor

This document applies the following constraints to the OSLCCoreVocab vocabulary terms.

An OSLC server providing the Attachments capability **MUST** implement the vocabulary defined in this section. [at-22]

The `oslc:AttachmentDescriptor` resource type is used to describe the binary resource (or non-RDF Resource) associated with a particular resource. When a client POSTs an attachment content to a server, the server stores the attachment content and assigns a URI just like any other type of resource creation but it may also create an `oslc:AttachmentDescriptor` resource to contain data about the attachment.

There is no restriction on the content of each attachment resource. For example, it could be a photo of a kitten, an installation manual, a log file, or a source code patch. Since the attachment cannot be expected to contain additional client or server supplied data, a typical set of properties for each attachment is included with the `oslc:AttachmentDescriptor` resource itself. Thus, the object of each `oslc:attachment` statement is the binary attachment. Issuing an HTTP HEAD or GET operation on that binary attachment resource URL should produce an HTTP response with a header value of `Link: rel='describedBy'` to indicate the URL of the `oslc:AttachmentDescriptor` resource. The properties for the `oslc:AttachmentDescriptor` resource are indicated in the table below.

- **Describes:** `http://open-services.net/ns/core#AttachmentDescriptor`
- **Summary:** LDP-RS to contain data about a LDP-NR(Attachment)

AttachmentDescriptor Properties

Prefixed Name	*Occurs*	*Read-only*	*Value-type*	*Representation*	*Range*	*Description*
`dcterms:created`	Zero-or-one	true	dateTime	N/A	Unspecified	Timestamp of attachment creation.
`dcterms:creator`	Zero-or-many	true	AnyResource	Either	Unspecified	Creator or creators of the attachment. Likely a `foaf:Person`, but not necessarily so.
`dcterms:description`	Zero-or-one	false	XMLLiteral	N/A	Unspecified	Descriptive text about the attachment.
`dcterms:format`	Zero-or-one	true	unspecified	Either	Unspecified	MIME type of the attachment content; **SHOULD** be a PURL media-type resource [at-23].
`dcterms:identifier`	Zero-or-one	true	string	N/A	Unspecified	System-assigned identifier.
`dcterms:title`	Zero-or-one	false	string	N/A	Unspecified	Client-specified file name or title.
`oslc:attachmentSize`	Zero-or-one	true	integer	N/A	Unspecified	Size in bytes of the attachment content.

7. Conformance

Implementations of this specification need to satisfy the following conformance clauses.

Clause Number	Requirement
at-1	Servers that support OSLC attachments **MUST** be Linked Data Platform 1.0 conformant servers [LDP].
at-2	Each resource that supports attachments **MUST** have at least one `oslc:AttachmentContainer` that holds attachments for that resource.
at-3	Responses to HTTP requests for resources that support attachments **MUST** contain at least one Link header [RFC8288] where the context URI is the resource URI, the Link relation is `http://open-services.net/ns/core#AttachmentContainer`, and the target URI is the URI of an `oslc:AttachmentContainer` resource.
at-4	An attachment **MUST** be a conformant Linked Data Platform Non-RDF Source (LDP-NR).
at-5	Successful responses to HTTP GET requests for an attachment URI **SHOULD** include a `Content-Disposition` header [RFC2183] with disposition type `attachment` and a filename parameter. The filename is often the `Slug` header value used to create the attachment with an appropriate file extension added for the attachment's media type.
at-6	If an attachment has an associated `oslc:AttachmentDescriptor`, responses to HTTP requests for the attachment URI **MUST** include a Link header [RFC8288] where the context URI is the attachment URI, the Link relation is `describedby`, and the target URI is the URI of the `oslc:AttachmentDescriptor`.
at-7	When servers update an attachment, they **MUST** also update any affected `oslc:AttachmentDescriptor` properties of the associated attachment descriptor.
at-8	When deleting attachments, servers **MUST** also delete any associated `oslc:AttachmentDescriptor` resources.
at-9	Each `oslc:AttachmentContainer` **MUST** be a conformant Linked Data Platform Container (LDPC).
at-10	Clients **MAY** use the HTTP `Slug` request header [RFC5023] to suggest a name when creating an attachment. If present, the `Slug` header **SHOULD NOT** include a file extension.
at-11	Servers **SHOULD NOT** reject an HTTP POST request to an `oslc:AttachmentContainer` solely because it does not contain a `Slug` header.
at-12	Servers **SHOULD NOT** reject an an HTTP POST request to an `oslc:AttachmentContainer` solely because they cannot use the `Slug` value unchanged. Servers **SHOULD** instead modify the `Slug` value as needed or assign a different name.
at-13	In response to a successful HTTP POST request that creates an attachment with an associated `oslc:AttachmentDescriptor`, the server **MUST** include an HTTP Link header in the response where the context URI is the newly-created attachment URI, the link relation is `describedby`, and the link target is the `oslc:AttachmentDescriptor` URI.
at-14	Clients **MAY** specify an LDP-NR interaction model when POSTing RDF content to an `oslc:AttachmentContainer` by including an HTTP Link header where the target URI is `http://www.w3.org/ns/ldp#NonRDFSource` and the link relation is `type`. In this case, Servers **MUST** honor the client's requested interaction model and treat the resource as an LDP-NR.
at-15	Servers **MUST** reject an HTTP DELETE request to an `oslc:AttachmentContainer`.
at-16	Servers **MAY** create an associated `oslc:AttachmentDescriptor` to describe properties of the attachment such as its name, media type, and size.
at-17	An `oslc:AttachmentDescriptor` **MUST** have an explicit `rdf:type` set to `http://open-services.net/ns/core#AttachmentDescriptor` in its RDF representations. It **MAY** have additional `rdf:type` values.
at-18	An `oslc:AttachmentDescriptor` **MUST** be a conforming Linked Data Platform RDF Source (LDPR).
at-19	The `dcterms:title` of the `oslc:AttachmentDescriptor` **SHOULD** be the value of the client-supplied HTTP `Slug` header.
at-20	Servers **SHOULD** use the `Content-Type` header value from an attachment creation request to determine the `dcterms:format` property value in the newly-created attachment's `oslc:AttachmentDescriptor`. The `dcterms:format` value **SHOULD** be a [PURLMediaTypes] media-type resource.
at-21	An `oslc:AttachmentDescriptor` **MUST** conform to the shape defined in 6.1 Resource: AttachmentDescriptor.
at-22	An OSLC server providing the Attachments capability **MUST** implement the vocabulary defined in this section.
at-23	MIME type of the attachment content; **SHOULD** be a PURL media-type resource