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The Media Types application/mods+xml, application/mads+xml,  
application/mets+xml, application/marcxml+xml, and application/sru+xml

#### Abstract

This document specifies media types for the following formats: MODS (Metadata Object Description Schema), MADS (Metadata Authority Description Schema), METS (Metadata Encoding and Transmission Standard), MARCXML (MARC21 XML Schema), and the SRU (Search/Retrieve via URL Response Format) protocol response XML schema. These are all XML schemas providing representations of various forms of information including metadata and search results.

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## 1. Introduction

The Library of Congress, on behalf of and in collaboration with various components of the metadata and information retrieval community, has issued specifications that define formats for representation of various forms of information including metadata and search results. This memo provides information about the media types associated with several of these formats, all of which are XML schemas.

**MODS:** Metadata Object Description Schema. An XML schema for a bibliographic element set that may be used for a variety of purposes, and particularly for library applications.

**MADS:** Metadata Authority Description Schema. An XML schema for an authority element set used to provide metadata about agents (people, organizations), events, and terms (topics, geographics, genres, etc.). It is a companion to MODS.

**METS:** Metadata Encoding and Transmission Standard. An XML schema for encoding descriptive, administrative, and structural metadata regarding objects within a digital library.

**MARCXML:** MARC21 XML Schema. An XML schema for the direct XML representation of the MARC format (for which there already exists a media type, application/marc; see [RFC2220]). By "direct XML representation", we mean that it encodes the actual MARC data within XML. (This is in contrast to MODS: MARC uses codes for its element names; MODS represents the same information but uses semantically meaningful names while MARCXML uses the MARC codes.)

**SRU:** Search/Retrieve via URL Response Format. An XML schema for the SRU response. SRU is a protocol, and the media type sru+xml pertains specifically to the default SRU response. The SRU response may be supplied in any of a number of suitable schemas, RSS, ATOM, for example, and the client identifies the desired format in the request, hence the need for a media type. This mechanism will be introduced in SRU 2.0; in previous versions (that is, all versions to date; 2.0 is in development), all responses are supplied in the existing default format, so no media type was necessary. SRU 2.0 is being developed within the Organization for the Advancement of Structured Information Standards (OASIS).

## 2. Registration for mods+xml

MIME media type name: application

MIME subtype name: mods+xml

Required parameters: None

Optional parameters: (charset) This parameter has semantics identical to the charset parameter of the "application/xml" media type as specified in [RFC3023].

Encoding considerations: Identical to those of "application/xml" as described in [RFC3023].

Security considerations: See Section 8 of RFC 6207.

Interoperability considerations: There are no known interoperability issues.

Published specification: [MODS-SCHEMA], [MODS].

Applications which use this media type: Various MODS-conformant toolkits use this media type.

Additional information:

Magic number(s): None

File extension(s): .mods

Macintosh file type code(s): TEXT

Person and email address to contact for further information:  
Ray Denenberg <rden@loc.gov>

Intended usage: COMMON

Restrictions on usage: None

Author/Change controller: The MODS specification was developed by the Library of Congress and is maintained by the Library of Congress in conjunction with the MODS Editorial Committee, which has change control over the specification.

## 3. Registration for mads+xml

MIME media type name: application

MIME subtype name: mads+xml

Required parameters: None

Optional parameters: (charset) This parameter has semantics identical to the charset parameter of the "application/xml" media type as specified in [RFC3023].

Encoding considerations: Identical to those of "application/xml" as described in [RFC3023].

Security considerations: See Section 8 of RFC 6207.

Interoperability considerations: There are no known interoperability issues.

Published specification: [MADS-SCHEMA], [MADS].

Applications which use this media type: Various MADS conformant toolkits use this media type.

Additional information:

Magic number(s): None

File extension(s): .mads

Macintosh file type code(s): TEXT

Person and email address to contact for further information:  
Ray Denenberg <rden@loc.gov>

Intended usage: COMMON

Restrictions on usage: None

Author/Change controller: The MADS specification was developed by the Library of Congress and is maintained by the Library of Congress in conjunction with the MODS Editorial Committee, which has change control over the specification.

## 4. Registration for mets+xml

MIME media type name: application

MIME subtype name: mets+xml

Required parameters: None

Optional parameters: (charset) This parameter has semantics identical to the charset parameter of the "application/xml" media type as specified in [RFC3023].

Encoding considerations: Identical to those of "application/xml" as described in [RFC3023].

Security considerations: See Section 8 of RFC 6207.

Interoperability considerations: There are no known interoperability issues.

Published specification: [METS-SCHEMA], [METS].

Applications which use this media type: Various METS conformant toolkits use this media type.

Additional information:

Magic number(s): None

File extension(s): .mets

Macintosh file type code(s): TEXT

Person and email address to contact for further information:  
Ray Denenberg <rden@loc.gov>

Intended usage: COMMON

Restrictions on usage: None

Author/Change controller: The METS specification was developed by the Library of Congress and is maintained by the Library of Congress in conjunction with the METS Editorial Board as an initiative of the Digital Library Federation.

## 5. Registration for marcxml+xml

MIME media type name: application

MIME subtype name: marcxml+xml

Required parameters: None

Optional parameters: (charset) This parameter has semantics identical to the charset parameter of the "application/xml" media type as specified in [RFC3023].

Encoding considerations: Identical to those of "application/xml" as described in [RFC3023].

Security considerations: See Section 8 of RFC 6207.

Interoperability considerations: There are no known interoperability issues.

Published specification: [MARCXML-SCHEMA], [MARCXML].

Applications which use this media type: Various MARCXML conformant toolkits use this media type.

Additional information:

Magic number(s): None

File extension(s): .mrcx

Macintosh file type code(s): TEXT

Person and email address to contact for further information:  
Ray Denenberg <rden@loc.gov>

Intended usage: COMMON

Restrictions on usage: None

Author/Change controller: The MARCXML standard is driven by the MARC standards, maintained at the Library of Congress.

## 6. Registration for sru+xml

MIME media type name: application

MIME subtype name: sru+xml

Required parameters: None

Optional parameters: (charset) This parameter has semantics identical to the charset parameter of the "application/xml" media type as specified in [RFC3023].

Encoding considerations: Identical to those of "application/xml" as described in [RFC3023].

Security considerations: See Section 8 of RFC 6207.

Interoperability considerations: There are no known interoperability issues.

Published specification: [SRU-SCHEMA], [SRU].

Applications which use this media type: Various SRU conformant toolkits use this media type.

Additional information:

Magic number(s): None

File extension(s): .sru

Macintosh file type code(s): TEXT

Person and email address to contact for further information:  
Ray Denenberg <rden@loc.gov>

Intended usage: COMMON

Restrictions on usage: None

Author/Change controller: The SRU specification for versions earlier than 2.0 is maintained at the Library of Congress, in conjunction with the SRU Editorial Board. Version 2.0 (for which the sru+xml media type pertains) is being developed within OASIS.



## 7. IANA Considerations

IANA has registered the five media types described in Sections 2, 3, 4, 5, and 6 in the MIME media type registry (in the Standards Tree).

## 8. Security Considerations

An XML resource does not in itself compromise data security. Applications that retrieve XML files over a network by means of dereferencing a Uniform Resource Identifier [RFC3986] are advised to properly interpret the data so as to prevent unintended access. Hence, the security issues described in Section 7 of [RFC3986] apply.

Because the media types described in this document use the "+xml" convention, they share the security considerations described in Section 10 of [RFC3023].

In general, security issues related to the use of XML in IETF protocols are discussed in Section 7 of [RFC3470] also apply. In the following sections, we review some aspects that are important for document-centric XML as applied to text encoding.

### 8.1. Harmful Content

Any application that retrieves the XML media types described in this specification needs to be aware of risks connected with injection of harmful scripts and executable XML (i.e., "active content" as described in [RFC4288]). Although XML inclusion mechanisms and the use of external entities can introduce vulnerabilities to various forms of spoofing and also reveal aspects of a service in a way that may compromise its security, such vulnerabilities are application specific. In any case, MODS documents do not contain "active content".

### 8.2. Authenticity and Confidentiality

Historical and bibliographical information can often be encoded in MODS documents, and such information might even have legal force in some jurisdictions. Digitization and encoding of such information might require technologies for assuring authenticity, such as cryptographic check sums and electronic signatures. Similarly, historical documents might in part or in their entirety be confidential. Such confidentiality might be required by law or by the terms and conditions such as in the case of donated or deposited text from private sources. A text archive might need content filtering or cryptographic technologies to meet such requirements.

## 9. References

### 9.1. Normative References

- [RFC3023] Murata, M., St. Laurent, S., and D. Kohn, "XML Media Types", RFC 3023, January 2001.
- [RFC3470] Hollenbeck, S., Rose, M., and L. Masinter, "Guidelines for the Use of Extensible Markup Language (XML) within IETF Protocols", BCP 70, RFC 3470, January 2003.
- [RFC3986] Berners-Lee, T., Fielding, R., and L. Masinter, "Uniform Resource Identifier (URI): Generic Syntax", STD 66, RFC 3986, January 2005.
- [MADS-SCHEMA] Denenberg, R., "MADS Schema", <<http://www.loc.gov/standards/mads/mads.xsd>>.
- [MADS] Denenberg, R., "Metadata Authority Description Schema", <<http://www.loc.gov/standards/mads/>>.
- [MARCXML-SCHEMA] Trail, N., "MARCXML Schema", <<http://www.loc.gov/standards/marcxml/schema/MARC21slim.xsd>>.
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- [SRU-SCHEMA] Denenberg, R., "SRU Schema", <<http://www.loc.gov/standards/sru/oasis/schemas/sruResponse.xsd>>.
- [SRU] Denenberg, R., "Search/Retrieve via URL Response Format", <<http://www.loc.gov/standards/sru/>>.

## 9.2. Informative References

- [RFC2220] Guenther, R., "The Application/MARC Content-type", RFC 2220, October 1997.
- [RFC4288] Freed, N. and J. Klensin, "Media Type Specifications and Registration Procedures", BCP 13, RFC 4288, December 2005.

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