

# Online Resources

*I need to connect online resources to my metadata*

## Overview

As the World Wide Web has developed into a ubiquitous information source, links to on-line information and services have become a critical element in all metadata records. As URLs have increased in complexity, it has become more important to provide supporting information along with the links. The ISO Standards use CI\_OnlineResources to describe links. These include a rich set of attributes for describing on-line resources.

## Structure

The structure of the CI\_OnlineResource is shown here as [Unified Modeling Language](#). The only required field is linkage, the URL for the resource. There are five optional elements, each of which can occur just once, that provide more information about the resource that the URL links to. The function, name, and description can provide information to the user about what will happen when they click the link. The function and protocol can be used to classify the link in several ways and the applicationProfile can be used to provide information about applications that may be able to use the link automatically. See the XML section below for an example.

<div>&lt;&lt;DataType&gt;&gt;</div> <div>CI_OnlineResource</div>
+ linkage : URL
+ protocol [0..1] : CharacterString
+ applicationProfile [0..1] : CharacterString
+ name [0..1] : CharacterString
+ description [0..1] : CharacterString
+ function [0..1] : CI_OnLineFunctionCode

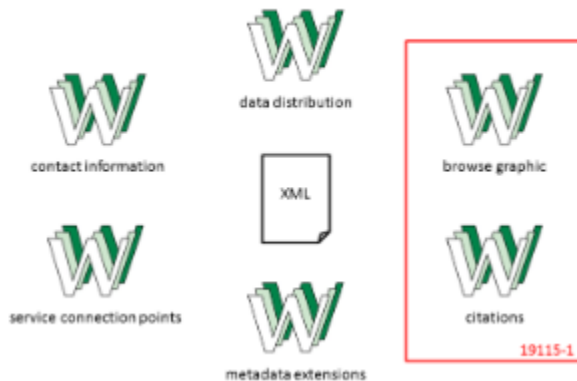
## Usage

CI\_OnlineResources can be connected to ISO metadata records in six places shown schematically in the Figure and in more detail below. The citation and browse graphic CI\_OnlineResources were added in ISO 19115-1 (the revision of 19115). The addition of CI\_OnlineResources directly into the CI\_Citation class is very important. It allows direct citation of web resources which was not possible in 19115.

Usage	Description and Xpath
<div>&lt;&lt;DataType&gt;&gt;</div> <div>CI_Contact</div> <div>+ phone [0..1]: CI_Telephone</div> <div>+ address [0..1]: CI_Address</div> <div>+ <b>onlineResource [0..1]: CI_OnlineResource</b></div> <div>+ hoursOfService [0..1] : CharacterString</div> <div>+ contactInstructions [0..1] : CharacterString</div>	<p>The most common use of CI_OnlineResources in the ISO Standards is as part of a CI_ResponsibleParty object in CI_Citations. In the current standard, this is the only CI_OnlineResource associated with a CI_Citation, so it gives the location of web resources. it can also be the Home Page for the contact.</p> <p>//gmd:CI_Citation/gmd:citedResponsibleParty /gmd:CI_ResponsibleParty/gmd:contactInfo/gmd:CI_Contact /gmd:onlineResource</p>
<div>MD_DigitalTransferOptions</div> <div>+ unitsOfDistribution [0..1] : CharacterString</div> <div>+ transferSize [0..1] : Real</div> <div>+ <b>onLine [0..*] : CI_OnlineResource</b></div> <div>+ offLine [0..1] : MD_Medium</div>	<p>The CI_OnlineResource in the MD_DigitalTransferOptions is the location of digital resources distributed over the Web.</p> <p>/gmi:MI_Metadata/gmd:distributionInfo/gmd:MD_Distribution/gmd:transferOptions/gmd:MD_DigitalTransferOptions/gmd:online or /gmi:MI_Metadata/gmd:distributionInfo/gmd:MD_Distribution/gmd:distributor/gmd:MD_Distributor/gmd:distributorTransferOptions/gmd:MD_DigitalTransferOptions /gmd:online</p>

<div>SV_OperationMetadata</div> <div>+ operationName : CharacterString</div> <div>+ DCP [1..*] : DCPList</div> <div>+ operationDescription [0..1] : CharacterString</div> <div>+ invocationName [0..1] : CharacterString</div> <div>+ connectPoint : [1..*] : CI_OnlineResource</div>	<p>The CI_OnlineResource in the SV_OperationMetadata is the URL for a service operation (e.g. GetCapabilities, GetMap).</p> <p>/gmi:MI_Metadata/gmd:identificationInfo/srv:SV_ServiceIdentification/srv:containsOperations/srv:SV_OperationMetadata/srv:connectPoint/gmd:CI_OnlineResource</p>
<div>MD_MetadataExtensionInformation</div> <div>+ extensionOnLineResource [0..1]: CI_OnlineResource</div>	<p>The CI_OnlineResource in the MD_MetadataExtensionInformation is the location of the description of extensions used in the metadata record.</p> <p>/gmi:MI_Metadata/gmd:metadataExtensionInfo/gmd:MD_MetadataExtensionInformation/gmd:extensionOnlineResource</p>

## Where Are CI\_OnlineResources?



## XML

```

<gmd:CI_OnlineResource>
  <gmd:linkage>
    <gmd:URL>link to resource</gmd:URL>
  </gmd:linkage>
  <gmd:protocol>
    <gco:CharacterString>Connection protocol to be used</gco:CharacterString>
  </gmd:protocol>
  <gmd:applicationProfile>
    <gco:CharacterString>Name of the application that can be used with resource</gco:CharacterString>
  </gmd:applicationProfile>
  <gmd:name>
    <gco:CharacterString>Name of resource</gco:CharacterString>
  </gmd:name>
  <gmd:description>
    <gco:CharacterString>description of resource</gco:CharacterString>
  </gmd:description>
  <gmd:function>
    <gmd:CI_OnLineFunctionCode codeList="http://www.isotc211.org/2005/resources/Codelist/gmxCodeLists.xml#CI_OnLineFunctionCode"
      codeListValue="information">information</gmd:CI_OnLineFunctionCode>
  </gmd:function>
</gmd:CI_OnlineResource>

```

## Notes

The CI\_OnlineResource is one of the most simple objects included in the ISO Standards. At the same time, this simple object raises some interesting questions.

## Required vs. Optional Elements

The elements in the `CI_OnlineResource` are relevant to the many conversations about metadata that start with a question about minimum requirements. The only required element, the linkage, carries the really critical information about the `CI_OnlineResource`, its location. By itself, however, this information can be difficult for a human to understand and use. This is particularly true in the common situation where many `CI_OnlineResources` are available for a given dataset. The name, description, and function elements provide critical additional information and allow resources to be presented to users in related groups. There are many situations in which optional fields make metadata easier for users to understand and use. Metadata with only required fields is typically difficult to use. Metadata creators should consider these applications when they make decisions about what to include in their metadata.

## Community Guidance

The ISO Standards are broad and questions about how they should be used are common. Community understanding, practice and guidance play an important role in developing consistent usage. The `CI_OnlineResource` object, even though it is very simple, helps demonstrate this point. The protocol element is defined as "connection protocol to be used". Examples might include http or ftp. The protocol is also included at the beginning of the URL, as in <http://www.isoTC211.org>. Should this URL be broken into two pieces: protocol = http and linkage = [www.isoTC211.org](http://www.isoTC211.org)? Should both fragments be combined in the linkage: <http://www.iso.TC211.org>? If they are combined, should protocol be left blank? All of these are reasonable questions and all three choices convey the same information content. Which is right?

As in the required vs. optional question discussed above, the correct answer involves usage. Including the protocol in the linkage element allows that element to be used without concatenating it together with the protocol element. The linkage can be used along with the name and description to easily form a nice package for users. At the same time, the protocol element can be used as a classifier for `CI_OnlineResources` to answer the question: "is this dataset available via ftp?". So the correct answer is use both elements but don't concatenate them together to create a link. Seems to make sense, but time, and practice, will tell.