



# The XLink Reference Scheme for SML

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## Abstract

The Service Modeling Language [[SML](#)] specification extends [[XML](#)] and [[XML Schema](#)] with a mechanism for incorporating into XML documents references to other documents or document fragments. This technical note addresses the construction of an SML reference scheme based on the XML Linking Language [[XLink](#)].

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This is the [W3C Working Group Note](#) "The XLink Reference Scheme for SML". This document was produced by the [SML Working Group](#) as part of the [XML Activity](#).

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Publication as a Working Group Note does not imply endorsement by the W3C Membership. This is a draft document and may be updated, replaced or obsoleted by

**Comment [LKC1]:** [style] Re name of ref scheme: Should it be called the SML XLink Reference Scheme. IOW, should all SML ref schemes be named with an initial "SML"? Whatever the choice, use it consistently throughout the doc.

**Comment [JA2R1]:** Personally, I'm used to "SML blah Reference Scheme" so mild preference for that. "blah SML Reference Scheme" would be OK too (this idea comes from URI schemes, e.g. the HTTP URI Scheme)

**Comment [JA3]:** Editors please review: I thought the convention was this was to be current at time of publication, and could only be current working group members. If so, we'd have to move Pratul's name to an Ack section.

other documents at any time. It is inappropriate to cite this document as other than work in progress.

This document is intended to illustrate the design of an SML reference scheme based on [\[XLink\]](#) links. Currently, this document is consistent with the [\[SML\]](#) and [\[SML-IF\]](#) specifications, but it may be obsoleted by future versions of these specifications.

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### 1. Introduction [\[Back to Contents\]](#)

The Service Modeling Language [\[SML\]](#) specification extends XML Schema with a mechanism for incorporating into XML documents references to other documents or document fragments. A reference to another document or document fragment is encoded by means of markup compliant with one or [more](#) [\[reference schemes\]](#). The SML specification defines one reference scheme, the SML URI Reference Scheme, which enables XML documents to use URIs to identify documents or document fragments. The SML URI Reference Scheme has the significant advantage of guaranteeing referential conformance of models that are exchanged between vendors (see [Section 5.1](#) of [\[SML-IF\]](#)).

The SML specification does not mandate the use of any specific reference scheme, and provides an extensibility mechanism for defining new reference schemes. This note illustrates how the extensibility mechanism can be used to define an SML reference scheme based on XLink links.

**Note:** The `xlink` prefix is used on XML attributes throughout this document to stand for the declaration of the XLink namespace on elements in whose scope the so-marked attribute appears (on the same element that bears the attribute or on some ancestor element), whether or not an XLink namespace declaration is present in the example.

Comment [JA4]: Inserted space before [

## 2. Definition

The XLink Reference Scheme is defined as follows:

1. An SML reference is identified as an instance of the XLink Reference Scheme if and only if all of the following conditions are true:
  - a. It has two attribute information items whose [local name] are `type` and `href`, and whose [namespace name] is `http://www.w3.org/1999/xlink`.
  - b. The content of `xlink:type` is the string `simple`.
2. An instance of the XLink Reference Scheme is valid if it meets all of the following requirements:
  - a. The content of `xlink:href` is of type `xs:anyURI` [XSD-Types].
  - b. The fragment component (if present) matches the syntax of one of the following:
    - i. The `smlxpath1()` XPointer scheme as defined in [SML]
    - ii. An XPointer [shorthand pointer] as defined in [XPointer]
3. An SML reference that is an instance of the XLink Reference Scheme is resolved using the following steps:
  - a. Let **U** be the URI reference that is the content of `xlink:href`. Let **S** be the specification that defines the URI scheme of **U**, as well as rules for determining same-document references [RFC-3986] for said schema.
  - b. Obtain an XML document **D** as follows:
    - i. If **U** is a same-document reference, then **D** is the document containing the SML reference.
    - ii. Otherwise, **D** is determined as follows:
      1. If **U** is a relative reference, then let **U'** be the result of transforming **U** to form an (absolute) URI using the [base URI] property of the SML reference element as the base URI. Otherwise, let **U'** be **U** (i.e., the URI reference itself). The computation of the [base URI] property is implementation-defined.
      2. Dereference **U'** as defined in **S**. If the document targeted by **U'** is in the current SML model, then **D** is that document. Otherwise, since the document is not in the current SML model, the SML XLink Reference Scheme instance is unresolved (and **D** has no value).

**Note:** As a result of the above definition of [document – link to SML 2.2], if the retrieved object is not of XML media type or if it is not well-formed XML then, by definition, that object is not a document as defined by this specification SML. In this case, the SML reference scheme instance is unresolved.

**Comment [LKC5]:** [style] Self-evident

**Comment [JA6R5]:** I'll just note that the equivalent SML specification section headings are as follows, and ask the editors for some level of consistency:  
4.3 SML Reference Schemes  
4.3.1 SML URI Reference Scheme  
4.3.1.1 smlxpath1() scheme

**Comment [LKC7]:** [style] Consider replacing each top-level numbered item with a sub-section (e.g., "2.1 Structural Requirements") and using the existing text as an introductory paragraph for that sub-section. I have not made these edits yet because doing so would introduce so much change as to render the doc unreadable for review.

**Comment [JA8R7]:** Understand the motivation; whatever the working group decides, I would like to maintain the parallel structure between this and SML 4.3.1's content.

**Comment [LKC9]:** [style] Redundant

**Comment [JA10R9]:** Disagree. Original was written to ONLY specify rules for resolving instances of the reference scheme -in the context of- an SML reference; it allows (does not proscribe) instances of the reference scheme from existing outside the context of an SML reference. While we might not have such uses in sight, it is good specification practice to not over-specify (in this case, to not prevent other future specifications from re-using the concepts in non-interfering ways).

**Comment [JA11]:** This should be either deleted, or rephrased to make it clear that the generic URI syntax RFC (3986 at the moment) defines – independent of any URI scheme, in section 4.4 – which URI references are s{... [1]

**Comment [LKC12]:** [style] Active voice

**Comment [JA13R12]:** While I'm inclined to prefer active voice as well, I'm not clear why this particular instance was singled out (versu... [2]

**Comment [LKC14]:** [content] Wording similar to SML-IF sec 5.3.4 item

**Comment [JA15R14]:** Appropriate change for SML 4.3.1 too

**Comment [LKC16]:** [content] Necessary to mention?

**Comment [JA17R16]:** In the context of an SML reference scheme definition, I lean toward yes per the working group discussion abc... [3]

**Comment [LKC18]:** [content] Irrelevant

**Comment [JA19R18]:** We were informed at the time of writing that other working groups experience showed that some readers se... [4]

**Comment [LKC20]:** [content] Should be more precise here.

**Comment [LKC21]:** [content] Should be 'and'?

**Comment [JA22R21]:** No, 'or' is correct.

- c. If no fragment component is present in **U**, the SML XLink Reference Scheme instance resolves to the root element of **D**.
- d. If a fragment component is present in **U**, then the appropriate case among the following applies:
  - i. If the fragment component matches the `smlxpath1()` XPointer scheme syntax, then the reference target is obtained by applying the fragment component to **D**, as defined in Section 4.3.1.1 of [SML].
  - ii. If the fragment component complies with the [shorthand pointer] syntax, then the appropriate case among the following applies:
    - 1. If a target **T** can be identified in **D** based on the [XML- Schema-determined ID], then the reference target is **T**.
    - 2. If a target in **D** cannot be identified based on the [XML- Schema-determined ID], then it is implementation-defined whether the reference target in **D** is identified based on other criteria allowed for [shorthand pointers].
- 4. Instances of the XLink Reference Scheme are transformed to [target-complete identifiers] through standard URI processing, as described in the applicable URI RFC.

**Comment [LKC23]:** [content] What if the fragment is neither `smlxpath1` nor shorthand pointer? It needs to be spelled out.

**Comment [JA24R23]:** We might need to add 'valid' to 3 (in SML 4.3.1 as well). If we do, no other cases are possible here.

**Comment [LKC25]:** [content] Would this be S as defined above in 3.a?

**Comment [JA26R25]:** No. S defines a URI scheme; "the URI RFC" means to point to the current RFC for generic URI syntax and simultaneously avoid the 'problem' that schema 1.0 says anyURI values comply with RFC 2096 + 2732 (precursor to 3986, which superseded them) but 3986 also fixes ambiguities in transformation using base URIs. Talk to Kumar for more history on this.

**Comment [LKC27]:** [content] Added

**Comment [LKC28]:** [content] Add actual URI

**Comment [JA29]:** Only valid in schemas

### 3. Examples

The following example illustrates an instance of the XLink Reference Scheme where the URI in `xlink:href` has no fragment component:

```
<Student>
  <ID>123</ID>
  <Name>Jane Doe</Name>
  <EnrolledCourses>
    <EnrolledCourse
      xmlns:sml=""
      xmlns:xlink="http://www.w3.org/1999/xlink"
      sml:ref="true"
      sml:nilref="false"
      sml:targetType="CourseType"
      xlink:type="simple"
      xlink:href="http://www.university.example.org/phy101.xml"
    </EnrolledCourse>
  </EnrolledCourses>
</Student>
```

**Comment [LKC29]:** Only valid in schemas

Here, the `EnrolledCourse` element is a valid instance of the XLink Reference Scheme since the content of `xlink:type` is the `string simple` and the content of `xlink:href` is of type `xs:anyURI`. It is also a non-null SML reference since the content of `sml:ref` is true, and in particular a non-null SML reference since the content of `sml:nilref` is false. The target of the reference is the root element of the XML document obtained by dereferencing `http://www.university.example.org/phy101.xml`.

**Comment [JA30]:** Several edits here to more clearly link it back to the definition. Editorial license given on re-ordering it.

The next example illustrates an instance of XLink Reference Scheme where the URI in `xlink:href` has a fragment component that matches the syntax of the `smlxpath1()` XPointer scheme:

```
<Student>
  <ID>123</ID>
  <Name>Jane Doe</Name>
  <EnrolledCourses>
    <EnrolledCourse
      xmlns:sml=""
      xmlns:xlink=""
      xmlns:u="http://www.university.example.org/ns"
      sml:ref="true"
      sml:targetType="CourseType"
      xlink:type="simple"

xlink:href="http://www.university.example.org/physics.xml

#smlxpath1(u:Courses/u:Course[u:Name='PHY101'])
    </EnrolledCourse>
  </EnrolledCourses>
</Student>
```

**Comment [JA31]:** Need URI x2

**Comment [JA32]:** Same edits as previous example

The target of the reference is the element identified by the path `/u:Courses/u:Course[u:Name='PHY101']` in the XML document obtained by dereferencing `http://www.university.example.org/physics.xml`.

## 4. References

**Comment [LKC33]:** [content] TBD, but I don't want to do it in Word only to have to redo the work in HTML.

### SML

*Service Modeling Language, Version 1.1*, Bhalchandra Pandit, Valentina Popescu, Virginia Smith, Editors. World Wide Web Consortium, @@@@. This version of the Service Modeling Language specification is

available at <http://www.w3.org/TR/@@@/WD-sml-@@@@@/>. The latest version of [Service Modeling Language, Version 1.1](http://www.w3.org/TR/sml) is available at <http://www.w3.org/TR/sml>.

**SML-IF**

TBD

**XLink**

TBD

**XPointer**

TBD

**XML-Info**

TBD

**XSD-Types**

TBD

| **[RFC-36893986](#)**

TBD



