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An Extensible Markup Language (XML) Format for Representing Resource
Lists
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Abstract

In multimedia communications, presence and instant messaging systems, there is a need to represent lists of Uniform Resource Identifiers (URIs). These lists, which typically reside on a server, can be subscribed to, in order to learn the presence status of a group of users. A Session Initiation Protocol (SIP) INVITE message can be sent to them, causing the creation of a conference call. This specification defines an Extensible Markup Language (XML) document format for representing resource lists. Such a document can be manipulated by clients using the XML Configuration Access Protocol (XCAP), although other techniques are permitted.

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1. Introduction

In multimedia communications, presence and instant messaging systems, operations are frequently performed on lists of Uniform Resource Identifiers (URIs). One such example is a presence list [[13](#)]. These lists are used by Session Initiation Protocol (SIP) for Instant Messaging and Presence (SIMPLE) [[9](#)] Resource List Servers (RLS) [[11](#)] for processing list subscriptions. A presence list can also be used by a user agent that chooses to subscribe to each user in its presence list, rather than using a list subscription. In such a case, the client would read the list from local storage, and generate subscriptions to each member.

It is common for users to share presence lists. As an example, user A may have three people in their list that they wish to tell user B about. User A would like to send an email to user B with an attachment describing these three people. Should user B open the attachment, the three people can be added to their own presence list. Doing this requires a standardized format for exchanging lists over email, instant messaging, and other communications protocols.

There are other applications of resource lists besides presence lists. Another example is a list of recipients for an instant message, or a list of users to invite to a conference bridge.

This specification describes a common format for representing such a list, and for describing the set of actions which may be performed against the list. Lists can be hierarchical, and can contain sub-lists referenced by a URI.

Resource list documents can be manipulated by clients using several means. One such mechanism is the XML Configuration Access Protocol (XCAP) [[7](#)]. This specification defines the details necessary for using XCAP to manage presence authorization documents.

[2. Terminology](#)

In this document, the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in [RFC 2119](#) [[1](#)] and indicate requirement levels for compliant implementations.

3. Structure of a Resource List

A resource list is an XML [2] document that MUST be well-formed and SHOULD be valid. Resource list documents MUST be based on XML 1.0 and MUST be encoded using UTF-8. This specification makes use of XML namespaces for identifying resource list documents and document fragments. The namespace URI for elements defined by this specification is a URN [3], using the namespace identifier 'ietf' defined by [5] and extended by RFC 3688 [6]. This URN is:

```
urn:ietf:params:xml:ns:resource-lists
```

A resource list document begins with the root element tag "resource-lists". It consists of an optional "mandatory-ns" element (defined in XCAP [7]), followed by any number of "list" sub-elements, each of which is a resource list. Other elements from different namespaces MAY be present for the purposes of extensibility; elements or attributes from unknown namespaces MUST be ignored. There are three attributes associated with the "list" element. The first is "name". This attribute is a descriptive name for the list. It MUST be unique amongst all other list elements within the same parent

element. It serves as a useful, but optional handle to identify a list.

Each list element will also have boolean attributes which indicate a specific action that may be made against that list. This specification defines a single attribute - "subscribeable" - which indicates that the list may be subscribed to using the SIP event list specification [11]. This application usage does not provide any information on which users would be authorized to subscribe to the list, however.

Extensions to this application usage MAY define additional boolean elements, each within a different namespace, for the purposes of indicating other actions that may be performed. When an attribute is absent, it implies that the operation is not supported.

The third other attribute, "uri" MAY be present. It provides a URI that can be used to access the list, for example, using the SIP event notification extension for lists [11]. As a result, the URI MUST be either a SIP URI or a pres URI [12].

Each "list" element is composed of a sequence of zero or more elements, each of which may be an "entry" element, a "list" element, an "entry-ref" element, or an "external" element. The ability of a "list" element to contain other "list" elements means that a resource list can be hierarchically structured. An "entry" element describes a single URI that is part of the list. An "entry-ref" element allows an

entry to be included by reference, rather than by value. The content of "entry-ref" is a URI that points to an "entry" element in this document or another. This URI MUST be an HTTP URI identifying an XCAP resource. An "external" element contains a reference to a list stored on another server. The content of this element MUST also be an HTTP URI identifying an XCAP resource. A "list" element can also contain elements from other namespaces, for the purposes of extensibility.

The "entry" element describes a single resource. The "entry" element has two attributes:

name: This optional attribute is a unique identifier amongst all other "entry" elements of the same parent.

uri: This mandatory attribute is a URI that is used to access the resource. It MUST be either a SIP or pres URI.

The "entry" element contains a sequence of other elements. Only one such element is defined at this time, which is "display-name". This element provides a UTF-8 encoded string, meant for consumption by the user, that describes the resource. Unlike the "name" attribute of the entry element, the "display-name" has no uniqueness requirements. Other elements from other namespaces MAY be included. This is meant to support the inclusion of other information about the entry, such as a phone number or postal address.

[4.](#) XML Schema

The following is the XML schema definition of the resource list:

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema targetNamespace="urn:ietf:params:xml:ns:resource-lists"
```

```

xmlns:xcap="urn:ietf:params:xml:ns:xcap-must-understand"
xmlns="urn:ietf:params:xml:ns:resource-lists"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:import namespace="urn:ietf:params:xml:ns:xcap-must-understand"/>
  <xs:element name="resource-lists">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="xcap:mandatory-ns" minOccurs="0"/>
        <xs:element name="list" type="listType" minOccurs="0"
          maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:complexType name="listType">
    <xs:sequence maxOccurs="unbounded">
      <xs:choice>
        <xs:element name="list" minOccurs="0" maxOccurs="unbounded">
          <xs:complexType>
            <xs:complexContent>
              <xs:extension base="listType"/>
            </xs:complexContent>
          </xs:complexType>
        </xs:element>
        <xs:element name="external" type="xs:anyURI" minOccurs="0"
          maxOccurs="unbounded"/>
        <xs:element name="entry" type="entryType" minOccurs="0"
          maxOccurs="unbounded"/>
        <xs:element name="entry-ref" type="xs:anyURI" minOccurs="0"
          maxOccurs="unbounded"/>
        <xs:any namespace="##other" processContents="lax" minOccurs="0"
          maxOccurs="unbounded"/>
      </xs:choice>
    </xs:sequence>
    <xs:attribute name="name" type="xs:string" use="optional"/>
    <xs:attribute name="uri" type="xs:anyURI" use="optional"/>
    <xs:attribute name="subscribeable" type="xs:boolean" use="optional"/>
    <xs:anyAttribute namespace="##other"/>
  </xs:complexType>
  <xs:complexType name="entryType">
    <xs:sequence>

```



```
<xs:element name="display-name" type="display-nameType" minOccurs="0"/>
<xs:any namespace="##other" processContents="lax"
  minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="name" type="xs:string" use="optional"/>
<xs:attribute name="uri" type="xs:anyURI" use="required"/>
</xs:complexType>
<xs:simpleType name="display-nameType">
  <xs:restriction base="xs:string"/>
</xs:simpleType>
</xs:schema>
```

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[5](#). Example Document

The following is an example of a document compliant to the schema:

```
]]>
```

[6.](#) Usage with XCAP

Resource list documents can be manipulated with XCAP. This section provides the details necessary for such a usage.

[6.1](#) Application Unique ID

XCAP requires application usages to define a unique application usage ID (AUID) in either the IETF tree or a vendor tree. This specification defines the "resource-lists" AUID within the IETF tree, via the IANA registration in [Section 8](#).

[6.2](#) MIME Type

The MIME type for this document is "application/resource-lists+xml".

[6.3](#) XML Schema

The XML Schema for this document is defined as the sole content of [Section 4](#).

[6.4](#) Additional Constraints

None.

[6.5](#) Data Semantics

Semantics for the document content are provided in [Section 3](#).

[6.6](#) Naming Conventions

There are no naming conventions that need to be defined for this application usage. A subscription to a resource list will be to a specific URI. That URI will be one of the "uri" attributes defined in a list within one of the documents managed by an XCAP server.

[6.7](#) Resource Interdependencies

An XCAP server supporting this application usage need only worry about a single data interdependency - the "uri" attribute of the list element.

If the "uri" attribute is absent in a document written to an XCAP server, but the "subscribeable" flag is true, the XCAP server MUST allocate a URI for this list. This allocated URI MUST be globally unique, and MUST route to an RLS which will handle list subscriptions for the list defined by the document. The server MUST set the uri attribute of the document with this URI.

A server MUST NOT delete the "uri" attribute, however, should a client change the subscribeable flag to false after the server has allocated a URI.

If the "uri" attribute is present in a document written to an XCAP server, but the URI exists in another document managed by the server, the document is considered invalid. A server MUST reject such a request with a 409, and MAY include an XCAP error report in the body indicating this condition. The server MAY suggest, using the "alt-ns" element, alternate suggestions for a URI that is not currently allocated.

[6.8](#) Authorization Policies

This application usage does not modify the default XCAP authorization policy, which is that only a user can read, write or modify their own documents. A server can allow priveleged users to modify documents that they don't own, but the establishment and indication of such policies is outside the scope of this document. It is anticipated that a future application usage will define which users are allowed to modify a list resource.

[7.](#) Security Considerations

The configuration information defined by this application usage is particularly sensitive. It represents the principle set of people with whom a user would like to communicate. As a result, clients SHOULD use TLS when contacting servers in order to fetch this information. Note that this does not represent a change in requirement strength from XCAP.

[8.](#) IANA Considerations

There are several IANA considerations associated with this specification.

[8.1](#) XCAP Application Usage ID

This section registers a new XCAP Application Usage ID (AUID) according to the IANA procedures defined in [\[7\]](#).

Name of the AUID: resource-lists

Description: A resource list application is any application that needs access to a list of resources, identified by a URI, to which operations, such as subscriptions, can be applied.

[8.2](#) application/resource-lists+xml MIME Type

MIME media type name: application

MIME subtype name: resource-lists+xml

Mandatory parameters: none

Optional parameters: Same as charset parameter application/xml as specified in [RFC 3023](#) [4].

Encoding considerations: Same as encoding considerations of application/xml as specified in [RFC 3023](#) [4].

Security considerations: See [Section 10 of RFC 3023](#) [4] and [Section 7](#) of this specification.

Interoperability considerations: none.

Published specification: This document.

Applications which use this media type: This document type has been used to support subscriptions to lists of users [11] for SIP-based presence [9].

Additional Information:

 Magic Number: None

File Extension: .rl or .xml

Macintosh file type code: "TEXT"

Personal and email address for further information: Jonathan Rosenberg, jdrosen@jdrosen.net

Intended usage: COMMON

Author/Change controller: The IETF.

[8.3](#) URN Sub-Namespace Registration for urn:ietf:params:xml:ns:resource-lists

This section registers a new XML namespace, as per the guidelines in [RFC 3688](#) [6].

URI: The URI for this namespace is
urn:ietf:params:xml:ns:resource-lists.

Registrant Contact: IETF, SIMPLE working group, (simple@ietf.org),
Jonathan Rosenberg (jdrosen@jdrosen.net).

XML:

```
BEGIN
<?xml version="1.0"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML Basic 1.0//EN"
    "http://www.w3.org/TR/xhtml1-basic/xhtml1-basic10.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
  <meta http-equiv="content-type"
    content="text/html; charset=iso-8859-1"/>
  <title>Resource Lists Namespace</title>
</head>
<body>
  <h1>Namespace for Resource Lists</h1>
  <h2>application/resource-lists+xml</h2>
  <p>See <a href="[[[URL of published RFC]]]">RFCXXXX</a>.</p>
</body>
</html>
END
```

[8.4](#) Resource List Schema Registration

This section registers an XML schema per the procedures in [\[6\]](#).

URI: please assign.

Registrant Contact: IETF, SIMPLE working group, (simple@ietf.org),
Jonathan Rosenberg (jdrosen@jdrosen.net).

The XML for this schema can be found as the sole content of [Section 4](#).

Normative References

- [1] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [2] Bray, T., Paoli, J., Sperberg-McQueen, C. and E. Maler, "Extensible Markup Language (XML) 1.0 (Second Edition)", W3C FirstEdition REC-xml-20001006, October 2000.
- [3] Moats, R., "URN Syntax", [RFC 2141](#), May 1997.
- [4] Murata, M., St. Laurent, S. and D. Kohn, "XML Media Types", [RFC 3023](#), January 2001.
- [5] Moats, R., "A URN Namespace for IETF Documents", [RFC 2648](#), August 1999.
- [6] Mealling, M., "The IETF XML Registry", [BCP 81](#), [RFC 3688](#), January 2004.
- [7] Rosenberg, J., "The Extensible Markup Language (XML) Configuration Access Protocol (XCAP)", [draft-ietf-simple-xcap-01](#) (work in progress), October 2003.

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- [8] Day, M., Rosenberg, J. and H. Sugano, "A Model for Presence and Instant Messaging", [RFC 2778](#), February 2000.
- [9] Rosenberg, J., "A Presence Event Package for the Session Initiation Protocol (SIP)", [draft-ietf-simple-presence-10](#) (work in progress), January 2003.
- [10] Roach, A., "Session Initiation Protocol (SIP)-Specific Event Notification", [RFC 3265](#), June 2002.
- [11] Roach, A., Rosenberg, J. and B. Campbell, "A Session Initiation Protocol (SIP) Event Notification Extension for Resource Lists", [draft-ietf-simple-event-list-04](#) (work in progress), June 2003.
- [12] Peterson, J., "Common Profile for Presence (CPP)", [draft-ietf-imp-pres-04](#) (work in progress), October 2003.
- [13] Rosenberg, J. and M. Isomaki, "Requirements for Manipulation of Data Elements in Session Initiation Protocol (SIP) for Instant Messaging and Presence Leveraging Extensions (SIMPLE) Systems", [draft-ietf-simple-data-req-03](#) (work in progress), June 2003.

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