A Lightweight UDP Transport for the Internet Registry Information Service
draft-ietf-crisp-iris-lwz-00

Status of this Memo

By submitting this Internet-Draft, I certify that any applicable patent or other IPR claims of which I am aware have been disclosed, and any of which I become aware will be disclosed, in accordance with RFC 3668.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at http://www.ietf.org/ietf/1id-abstracts.txt.

The list of Internet-Draft Shadow Directories can be accessed at http://www.ietf.org/shadow.html.

This Internet-Draft will expire on April 8, 2005.

Copyright Notice

Copyright (C) The Internet Society (2004). All Rights Reserved.

Abstract

This document describes a lightweight UDP transport for the Internet Registry Information Service (IRIS).
Table of Contents

1. Introduction ....................................................... 3
2. Document Terminology ............................................. 4
3. UDP Transport ..................................................... 5
   3.1 Use of IRIS-LWZ ................................................ 5
      3.1.1 IRIS-LWZ Packet Formats ................................ 5
      3.1.2 IRIS-LWZ Transactions ................................... 6
   3.2 IRIS-LWZ Operations .......................................... 7
      3.2.1 Requests .................................................. 7
      3.2.2 Responses ................................................ 8
   3.3 Formal XML Syntax ............................................. 10
   3.4 IRIS Transport Mapping Definitions .......................... 11
      3.4.1 URI Scheme ............................................... 11
      3.4.2 Application Protocol Label ............................... 11
   3.5 Registrations .................................................. 12
      3.5.1 URI Scheme Registration ................................. 12
      3.5.2 Well-known UDP Port Registration ....................... 12
      3.5.3 S-NAPTR Registration ...................................... 12
4. Internationalization Considerations ................................ 14
5. IANA Considerations .............................................. 15
   5.1 XML Namespace URN Registration ............................... 15
   5.2 S-NAPTR Registration ......................................... 15
6. Security Considerations .......................................... 16
7. References ....................................................... 17
   7.1 Normative References ........................................ 17
   7.2 Informative References ...................................... 18
     Author’s Address ................................................. 18
     Intellectual Property and Copyright Statements ............ 19
1. Introduction

Using S-NAPTR, IRIS has the ability to define the use of multiple transports for different types of registry services, all at the discretion of the server operator. The UDP transport defined in this document is completely modular and may be used by any registry types.
2. Document Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC2119 [12].
3. UDP Transport

The binding of this UDP transport to IRIS is called IRIS-LWZ (for IRIS Lightweight using Compression).

IRIS-LWZ is composed of two parts, a 1 byte payload header and an XML request/response transaction payload. The XML request/response transaction payload may be compressed using the DEFLATE algorithm.

3.1 Use of IRIS-LWZ

3.1.1 IRIS-LWZ Packet Formats

The UDP packet format for IRIS-LWZ is as follows:

```
+-----------------+-----------------+
|     Src Port    |     Dst Port    |
+-----------------+-----------------+
|    Checksum     |    Length       |
+-----------------+-----------------+
| LWZ-HEADER      |                      |
+-----------------+                      |
|       Data: XML instance              |
|          compliant with IRIS-LWZ       |
|          schema defined above          |
+---------------------------------------+
```

Each IRIS-LWZ query and response is contained in a single UDP packet. If no length information is contained in the IRIS-LWZ query, servers should assume a packet size limitation of 512 bytes.

Each bit in the 1 byte payload header has the following meaning:

- bit 7 - version - if 0, the protocol is the version defined in this document. If 1, the rest of the bits in the header and the payload may be interpreted as another version.
- bit 6 - payload is deflate compressed - if 1, the payload is compressed using DEFLATE.
- bits 5 through 3 - reserved
- bit 2 - deflate not supported - if 1, do not respond with a payload compressed using DEFLATE.
- bit 1 - reserved
- bit 0 - protocol error - meaning that there was something not understood in the payload (e.g. a version mis-match, malformed XML, etc...).
3.1.2 IRIS-LWZ Transactions

3.1.2.1 Client behaviour

To initiate an IRIS-LWZ query, a client sends a UDP datagram to the identified IRIS-LWZ port on the destination server.

The client then waits for a reply from the server on the same port from which it sent the query packet. The timeout waiting for a reply is at the discretion of the client.

As an example, the client may send the following XML to the server:

```xml
<request
   xmlns="urn:ietf:params:xml:ns:iris-lwz"
   serverName="com" length="1280">

   <request xmlns="urn:ietf:params:xml:ns:iris1">
     <searchSet>
       <lookupEntity
         registryType="dreg1"
         entityClass="contact-handle"
         entityName="mak21" />
     </searchSet>

   </request>

</request>
```

3.1.2.2 Server behaviour

Upon receipt of an IRIS-LWZ query, the server will apply DEFLATE decompression to the payload if appropriate, carry out whatever processing is appropriate, create a valid IRIS-LWZ XML response instance to the query, and apply DEFLATE to that instance if necessary and appropriate. If the resulting size is greater than the maximum size provided in the query (or 512 bytes if no maximum size was provided), the server will respond with a IRIS-LWZ XML indicating the response was too large. The response is sent as a UDP datagram to the source address and port of the original query.

The server’s responsibility for addressing a query ends with the transmission of the UDP response datagram.
3.2 IRIS-LWZ Operations

The XML in the following sections is descriptive of the formal XML syntax described in Section 3.3.

For each request type, there is one or more response types. The following shows a brief summary:
- `<getProfiles>`
  * `<profiles>`
- `<request>`
  * an IRIS response.
  * `<error>` containing `<profiles>`
  * `<error>` containing `<length>`

3.2.1 Requests

IRIS-LWZ requests use the formal syntax specified in Section 3.3. There are two types of IRIS-LWZ requests:
- a profile request
- an IRIS query request

The profile request simply uses the `<getProfiles>` element.

```
<getProfiles
  xmlns="urn:ietf:params:xml:ns:iris-lwz" />
```

An IRIS request is wrapped in an `<request>` element. This element has an OPTIONAL 'length' attribute containing a positive integer. This attribute indicates the allowable length of the response in bytes. It allows clients that have an understanding of their UDP path to specify how long the response should be. Clients that do not care about UDP fragmentation may set this number arbitrarily high. If this attribute is not present, servers MUST assume a length of 512 bytes.

The following is an example of an IRIS request with a query in the ‘dchk1’ registry-type.
3.2.2 Responses

The IRIS-LWZ responses come in two flavors:
- a <profiles> response
- a <response> response

The <profiles> response MUST be returned by the server when a client issues a <getProfiles> request. The <profiles> element contains <profile> children. Each <profile> child element contains an IRIS profile as defined by IRIS-BEEP [8].

The following is an example of a <profiles> response.

```xml
<profiles xmlns="urn:ietf:params:xml:ns:iris-lwz">
  <profile>http://iana.org/beep/iris1/dchk1</profile>
</profiles>
```

The <response> response MUST be sent by the server to the client in reply to an <request>. It contains one of three types of content:
- an IRIS result response
- an error indicating the IRIS request was for an unsupported profile.
- an error indicating the IRIS response was too large to send.

An <response> containing an IRIS response simply contains the IRIS response to the appropriate IRIS request. The following is an
example of ‘dchk1’ IRIS response.

```xml
<response
 xmlns="urn:ietf:params:xml:ns:iris-lwz">
 <response xmlns="urn:ietf:params:xml:ns:iris1">
 <resultSet>
  <domain
   xmlns="urn:ietf:params:xml:ns:dchk1">
   <domainName>example.com</domainName>
   <status>
    <activeAndOnHold/>
   </status>
  </domain>
 </resultSet>
</response>
</response>

When a client makes an IRIS request for a profile that is not supported by the server, the server MUST return an <response> indicating that an error has occurred. This is done with the <error> child element. To signal this condition, the <error> element MUST contain the <profiles> element. Here is an example:

```xml
<response
 xmlns="urn:ietf:params:xml:ns:iris-lwz" >
 <error>
  <profiles>
   <profile>
    http://iana.org/beep/iris1/dchk1
   </profile>
  </profiles>
 </error>
</response>

When a client makes an IRIS request that yields a response too large to fit in the negotiated UDP packet, the server MUST respond with an <response> indicating that a size error has occurred. This is done with the <error> child element. To signal this condition, the <error> element MUST contain a <length> element. The content of the <length> element is a positive integer stating the size of the IRIS response.

Upon receiving this error, a client has the following options:
o Requery with another transport.
o Requery over IRIS-LWZ using a larger 'length' indicator.
o Signal an error to the user.

The following is an example of a length error:

```xml
<response
  xmlns="urn:ietf:params:xml:ns:iris-lwz">
  <error>
    <length>2652</length>
  </error>
</response>
```

### 3.3 Formal XML Syntax

The following is the XML Schema used to define IRIS-LWZ operations.

```xml
<?xml version="1.0"?>
<schema xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:irislwz="urn:ietf:params:xml:ns:iris-lwz"
  xmlns:iris="urn:ietf:params:xml:ns:iris1"
  targetNamespace="urn:ietf:params:xml:ns:iris-lwz"
  elementFormDefault="qualified">

  <import namespace="urn:ietf:params:xml:ns:iris1"/>

  <annotation>
    <documentation>
      Lightweight (LWZ) Transport for
      Internet Registry Information Service (IRIS)
      Schema v1
    </documentation>
  </annotation>

  <element name="getProfiles">
    <complexType>
    </complexType>
  </element>

  <element name="profiles">
    <complexType>
      <sequence>
        <element name="profile" type="anyURI"/>
      </sequence>
    </complexType>
  </element>

</schema>
```
3.4 IRIS Transport Mapping Definitions

This section lists the definitions required by IRIS [5] for transport mappings.

3.4.1 URI Scheme

The URI scheme name specific to this transport MUST be "iris.lwz".

3.4.2 Application Protocol Label

The application protocol label MUST be "iris.lwz".
3.5 Registrations

3.5.1 URI Scheme Registration

URL scheme name: iris.lwz

URL scheme syntax: defined in Section 3.4.1 and [5].

Character encoding considerations: as defined in RFC2396 [6].

Intended usage: identifies an IRIS entity made available using compressed XML over UDP

Applications using this scheme: defined in IRIS [5].

Interoperability considerations: n/a

Security Considerations: defined in Section 6.

Relevant Publications: IRIS [5].

Contact Information: Andrew Newton <andy@hxr.us>

Author/Change controller: the IESG

3.5.2 Well-known UDP Port Registration

Protocol Number: UDP

Message Formats, Types, Opcodes, and Sequences: defined in Section 3.1.1 and Section 3.2.

Functions: defined in IRIS [5].

Use of Broadcast/Multicast: none

Proposed Name: IRIS over LWZ

Short name: iris.lwz

Contact Information: Andrew Newton <andy@hxr.us>

3.5.3 S-NAPTR Registration

Application Protocol Label: iris.lwz

Intended usage: identifies an IRIS server using compressed XML over UDP
Interoperability considerations: n/a

Security Considerations: defined in Section 6.

Relevant Publications: IRIS [5].

Contact Information: Andrew Newton <andy@hxr.us>

Author/Change controller: the IESG
4. Internationalization Considerations

Implementers should be aware of considerations for internationalization in IRIS [5].
5. IANA Considerations

5.1 XML Namespace URN Registration

This document makes use of a proposed XML namespace and schema registry specified in XML_URN [18]. Accordingly, the following registration information is provided for the IANA:

- **URN/URI:**
  * urn:ietf:params:xml:ns:iris-lwz

- **Contact:**
  * Andrew Newton <andy@hxr.us>

- **XML:**
  * The XML Schema specified in Section 3.3

5.2 S-NAPTR Registration

Registrations with the IANA are described in Section 3.5.
6. Security Considerations

IRIS-LWZ is intended for serving public data; it provides no in-band mechanisms for authentication or encryption. Any application that needs that must provide out of band mechanisms to provide it (e.g., IPSec), or use the IRIS protocol with an application transport that provides such capabilities (e.g. BEEP [7]).
7. References

7.1 Normative References


<http://www.w3.org/TR/1999/REC-xml-names-19990114>.


<http://www.w3.org/TR/2001/REC-xmlschema-1-20010502/>.


[13] International Organization for Standardization, "Codes for the


7.2 Informative References


Author’s Address

Andrew L. Newton
VeriSign, Inc.
21345 Ridgetop Circle
Sterling, VA  20166
USA

Phone: +1 703 948 3382
EMail: anewton@verisignlabs.com; andy@hxr.us
URI: http://www.verisignlabs.com/
Intellectual Property Statement

The IETF takes no position regarding the validity or scope of any Intellectual Property Rights or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; nor does it represent that it has made any independent effort to identify any such rights. Information on the procedures with respect to rights in RFC documents can be found in BCP 78 and BCP 79.

Copies of IPR disclosures made to the IETF Secretariat and any assurances of licenses to be made available, or the result of an attempt made to obtain a general license or permission for the use of such proprietary rights by implementers or users of this specification can be obtained from the IETF on-line IPR repository at http://www.ietf.org/ipr.

The IETF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights that may cover technology that may be required to implement this standard. Please address the information to the IETF at ietf-ipr@ietf.org.

Disclaimer of Validity

This document and the information contained herein are provided on an "AS IS" basis and THE CONTRIBUTOR, THE ORGANIZATION HE/SHE REPRESENTS OR IS SPONSORED BY (IF ANY), THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Copyright Statement

Copyright (C) The Internet Society (2004). This document is subject to the rights, licenses and restrictions contained in BCP 78, and except as set forth therein, the authors retain all their rights.

Acknowledgment

Funding for the RFC Editor function is currently provided by the Internet Society.