

IMPP WG
Internet-Draft
Expires: June 6, 2003

D. Crocker
Brandenburg
J. Peterson
NeuStar
December 6, 2002

**Common Profile: Instant Messaging
draft-ietf-impp-im-01**

Status of this Memo

This document is an Internet-Draft and is in full conformance with all provisions of [Section 10 of RFC2026](#).

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 June 6, 2003.

Copyright Notice

Copyright (C) The Internet Society (2002). All Rights Reserved.

Abstract

Instant messaging is defined in [RFC2778](#) [5]. Today, numerous instant messaging protocols are in use, and little interoperability between services based on these protocols has been achieved. This specification defines common semantics and data formats for instant messaging to facilitate the creation of gateways between instant messaging services.

Table of Contents

1.	Introduction	3
2.	Terminology	3
3.	Abstract Instant Messaging Service	4
3.1	Overview of Instant Messaging Service	4
3.2	Identification of INSTANT INBOXes	5
3.2.1	Address Resolution	5
3.3	Format of Instant Messages	5
3.4	The Messaging Service	5
3.4.1	The Message Operation	5
3.4.2	Looping	6
4.	Security Considerations	7
5.	IANA Considerations	7
5.1	The IM URI Scheme	7
6.	Contributors	7
	Authors' Addresses	8
A.	IM URI IANA Registration Template	9
A.1	URI scheme name	9
A.2	URI scheme syntax	9
A.3	Character encoding considerations	9
A.4	Intended usage	9
A.5	Applications and/or protocols which use this URI scheme name	9
A.6	Interoperability considerations	10
A.7	Security considerations	10
A.8	Relevant publications	10
A.9	Person & email address to contact for further information .	10
A.10	Author/Change controller	10
A.11	Applications and/or protocols which use this URI scheme name	10
B.	Issues of Interest	10
B.1	Address Mapping	10
B.2	Source-Route Mapping	11
	Normative References	8
C.	Acknowledgments	11
	Full Copyright Statement	12

1. Introduction

Instant messaging is defined in [RFC2778](#) [5]. Today, numerous instant messaging protocols are in use, and little interoperability between services based on these protocols has been achieved. This specification defines semantics and data formats for common services of Instant Messaging to facilitate the creation of gateways between instant messaging services.

Service behavior is described abstractly in terms of operations invoked between the consumer and provider of a service. Accordingly, each IM service must specify how this behavior is mapped onto its own protocol interactions. The choice of strategy is a local matter, providing that there is a clear relation between the abstract behaviors of the service (as specified in this memo) and how it is faithfully realized by a particular instant messaging service.

The attributes for each operation are defined using an abstract syntax. Although the syntax specifies the range of possible data values, each IM service must specify how well-formed instances of the abstract representation are encoded as a concrete series of bits.

For example, one strategy might transmit an instant message as textual key/value pairs, another might use a compact binary representation, and a third might use nested containers. The choice of strategy is a local matter, providing that there is a clear relation between the abstract syntax (as specified in this memo) and how it is faithfully encoded by an particular instant messaging service.

In order to provide a means for the preservation of end-to-end features (especially security) to pass through instant messaging interoperability gateways, this specification also provides recommendations for instant messaging document formats that could be employed by instant messaging protocols.

2. Terminology

In this document, the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in [RFC2119](#) [1] and indicate requirement levels for compliant implementations.

This memos makes use of the vocabulary defined in [RFC2778](#) [5]. Terms such as CLOSED, INSTANT INBOX, INSTANT MESSAGE, and OPEN are used in the same meaning as defined therein.

This document defines operations and attributes of an instant messaging service. In order for a protocol to interface with an instant messaging gateway, it must support all of the operations described in this document (i.e. the instant messaging protocol must have some message or capability that provides the function described by this operation). Similarly, the attributes defined for these operations must correspond to information available in the instant messaging protocol in order for the protocol to interface with gateways defined by this specification. Note that these attributes provide only the minimum possible information that needs to be specified for interoperability - the functions in an instant messaging protocol that correspond to the operations described in this document can contain additional information that will not be mapped by CPIM.

3. Abstract Instant Messaging Service

3.1 Overview of Instant Messaging Service

When an application wants to send a message to an INSTANT INBOX, it invokes the message operation, e.g.,

```

+-----+               +-----+
|       |               |       |
| appl. | -- message ----> |  IM  |
|       |               | svc.  |
+-----+               +-----+

```

The message operation has the following attributes: source, destination, MaxForwards and TransID. 'source' and 'destination' identify the originator and destination of an instant message, respectively, and consist of an INSTANT INBOX identifier (as described in [Section 3.2](#)). The MaxForwards is a hop counter used in order to avoid loops through gateways. The TransID is a unique identifier used to correlate message operations to response operations.

The message operation also has some content, the instant message itself, which may be textual, or which may consist of other data. Some further information on content is provided in [Section 3.3](#).

Upon receiving a message operation, the service immediately responds by invoking the response operation containing the same transaction-identifier, e.g.,


```

+-----+
|      |
| appl. | <----- response --
|      |
+-----+
+-----+
|      |
| IM    |
| svc.  |
+-----+

```

The response operation contains the following attributes: TransID and status. The TransID is used to correlate the response to a particular instant message. Status indicates whether the delivery of the message succeeded or failed.

[3.2](#) Identification of INSTANT INBOXes

An INSTANT INBOX is specified using an instant messaging URI with the 'im:' URI scheme. The full syntax of the IM URI scheme is given in [Appendix A](#). An example would be: "im:fred@example.com"

[3.2.1](#) Address Resolution

A client determines the address of an appropriate system running a server by resolving the destination domain name that is part of the identifier to either an intermediate relay system or a final target system.

Compliant implementations SHOULD follow the guidelines for dereferencing URIs given in [\[2\]](#).

[3.3](#) Format of Instant Messages

This specification defines an abstract interoperability mechanism for instant messaging protocols; the message content definition given here pertains to semantics rather than syntax. However, some important properties for interoperability can only be provided if a common end-to-end format for instant messaging is employed by the interoperating instant messaging protocols. Implementations therefore SHOULD support the format defined in MSGFMT [\[4\]](#).

[3.4](#) The Messaging Service

Note that the transaction-identifier parameters used with the instant messaging service are potentially long-lived. Accordingly, the values generated for this parameter should be unique across a significant duration of time.

[3.4.1](#) The Message Operation

When an application wants to send an INSTANT MESSAGE, it invokes the

message operation.

When the service is informed of the message operation, it performs these steps:

1. If the source or destination does not refer to a valid INSTANT INBOX, a response operation having status "failure" is invoked.
2. If access control does not permit the application to request this operation, a response operation having status "failure" is invoked.
3. Otherwise:

If the service is able to successfully deliver the message, a response operation having status "success" is invoked.

If the service is unable to successfully deliver the message, a response operation having status "failure" is invoked.

If the service must delegate responsibility for delivery, and if the delegation will not result in a future authoritative indication to the service, a response operation having status "indeterminant" is invoked.

If the service must delegate responsibility for delivery, and if the delegation will result in a future authoritative indication to the service, then a response operation is invoked immediately after the indication is received.

When the service invokes the response operation, the transID parameter is identical to the value found in the message operation invoked by the application.

3.4.2 Looping

The dynamic routing of instant messages can result in looping of a message through a relay. Detection of loops is not always obvious, since aliasing and group list expansions can legitimately cause a message to pass through a relay more than one time.

This document assumes that instant messaging protocols that can be gatewayed by CPIM support some semantic equivalent to an integer value that indicates the maximum number of hops through which a message can pass. When that number of hops has been reached, the message is assumed to have looped.

When a CPIM gateway relays an instant message, it decrements the

value of the MaxForwards attribute. This document does not mandate any particular initial setting for the MaxForwards element in instant messaging protocols, but it is recommended that the value be reasonably large (over one hundred).

If a CPIM gateway handles an instant message operation that has a MaxForwards attribute of 0, it discards the message and invokes a failure operation.

4. Security Considerations

Detailed security considerations for instant messaging protocols are given in [RFC2779](#) (in particular, requirements are given in [section 5.4](#) and some motivating discussion in 8.1).

CPIM defines an interoperability function that is employed by gateways between instant messaging protocols. CPIM gateways MUST be compliant with the minimum security requirements of the instant messaging protocols with which they interface.

Note that end-to-end security properties (especially confidentiality and integrity) between instant messaging user agents that interface through a CPIM gateway can only be provided if a common instant message format (such as the format described in MSGFMT [\[4\]](#)) is supported by the protocols interfacing with the CPIM gateway.

5. IANA Considerations

The IANA assigns the "im" scheme.

5.1 The IM URI Scheme

The Instant Messaging (IM) URI scheme designates an Internet resource, namely an INSTANT INBOX.

The syntax of an IM URI is given in [Appendix A](#).

6. Contributors

The following individuals made substantial textual contributions to this document:

Athanassios Diacakis (thanos.diacakis@openwave.com)

Florencio Mazzoldi (flo@networkprojects.com)

Christian Huitema (huitema@microsoft.com)

Graham Klyne (gk@ninebynine.org)

Jonathan Rosenberg (jdrosen@dynamicsoft.com)

Robert Sparks (rsparks@dynamicsoft.com)

Hiroyasu Sugano (suga@flab.fujitsu.co.jp)

Normative References

- [1] Bradner, S., "Key words for use in RFCs to indicate requirement levels", [RFC 2119](#), March 1997.
- [2] Crocker, D. and J. Peterson, "Address resolution for Instant Messaging and Presence", [draft-ietf-impp-srv-00](#) (work in progress), October 2002.
- [3] Resnick, P., "Internet Message Format", [RFC 2822](#), STD 11, April 2001.
- [4] Atkins, D. and G. Klyne, "Common Presence and Instant Messaging: Message Format", [draft-ietf-impp-cpim-msgfmt-05](#) (work in progress), December 2001.
- [5] Day, M., Rosenberg, J. and H. Sugano, "A Model for Presence and Instant Messaging", [RFC 2778](#), February 2000.
- [6] Day, M., Aggarwal, S. and J. Vincent, "Instant Messaging / Presence Protocol Requirements", [RFC 2779](#), February 2000.
- [7] Allocchio, C., "GSTN Address Element Extensions in Email Services", [RFC 2846](#), June 2000.

Authors' Addresses

Dave Crocker
Brandenburg InternetWorking
675 Spruce Drive
Sunnyvale, CA 94086
US

Phone: +1 408/246-8253
EMail: dcrocker@brandenburg.com

Jon Peterson
NeuStar, Inc.
1800 Sutter St
Suite 570
Concord, CA 94520
US

Phone: +1 925/363-8720
EMail: jon.peterson@neustar.biz

[Appendix A](#). IM URI IANA Registration Template

This section provides the information to register the im: instant messaging URI.

[A.1](#) URI scheme name

im

[A.2](#) URI scheme syntax

The syntax follows the existing mailto: URI syntax specified in [RFC2368](#). The ABNF is:

IM-URI	=	"im:" [to] [headers]
to	=	#mailbox
headers	=	"?" header *("&" header)
header	=	hname "=" hvalue
hname	=	*urlc
hvalue	=	*urlc

[A.3](#) Character encoding considerations

Representation of non-ASCII character sets in local-part strings is limited to the standard methods provided as extensions to [RFC2822](#) [3].

[A.4](#) Intended usage

Use of the im: URI follows closely usage of the mailto: URI. That is, invocation of an IM URI will cause the user's instant messaging application to start, with destination address and message headers fill-in according to the information supplied in the URI.

[A.5](#) Applications and/or protocols which use this URI scheme name

It is anticipated that protocols compliant with [RFC2779](#), and meeting

the interoperability requirements specified here, will make use of this URI scheme name.

[A.6](#) Interoperability considerations

The underlying exchange protocol used to send an instant message may vary from service to service. Therefore complete, Internet-scale interoperability cannot be guaranteed. However, a service conforming to this specification permits gateways to achieve interoperability sufficient to the requirements of [RFC2779](#).

[A.7](#) Security considerations

When IM URIs are placed in instant messaging protocols, they convey the identity of the sender and/or the recipient. In some cases, anonymous messaging may be desired. Such a capability is beyond the scope of this specification.

[A.8](#) Relevant publications

[RFC2779](#), [RFC2778](#)

[A.9](#) Person & email address to contact for further information

Jon Peterson [mailto:jon.peterson@neustar.biz]

[A.10](#) Author/Change controller

This scheme is registered under the IETF tree. As such, IETF maintains change control.

[A.11](#) Applications and/or protocols which use this URI scheme name

Instant messaging service

[Appendix B](#). Issues of Interest

This appendix briefly discusses issues that may be of interest when designing an interoperation gateway.

[B.1](#) Address Mapping

When mapping the service described in this memo, mappings that place special information into the im: address local-part MUST use the meta-syntax defined in [RFC2846](#) [7].

B.2 Source-Route Mapping

The easiest mapping technique is a form of source- routing and usually is the least friendly to humans having to type the string. Source-routing also has a history of operational problems.

Use of source-routing for exchanges between different services is by a transformation that places the entire, original address string into the im: address local part and names the gateway in the domain part.

For example, if the destination INSTANT INBOX is "pepp://example.com/fred", then, after performing the necessary character conversions, the resulting mapping is:

```
im:pepp=example.com/fred@relay-domain
```

where "relay-domain" is derived from local configuration information.

Experience shows that it is vastly preferable to hide this mapping from end-users - if possible, the underlying software should perform the mapping automatically.

Appendix C. Acknowledgments

The authors would like to acknowledge John Ramsdell for his comments, suggestions and enthusiasm. Thanks to Derek Atkins for editorial fixes.

Full Copyright Statement

Copyright (C) The Internet Society (2002). All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the Internet Society or other Internet organizations, except as needed for the purpose of developing Internet standards in which case the procedures for copyrights defined in the Internet Standards process must be followed, or as required to translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by the Internet Society or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIMS 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.

Acknowledgement

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

