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**Address Resolution for Instant Messaging and Presence  
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Abstract

Presence and instant messaging are defined in [RFC2778](#) [5]. The Common Profiles for Presence [2] and Instant Messaging [1] define two URI schemes: 'im' for INSTANT INBOXes and 'pres' for PRESENTITIES. This document provides guidance for locating the resources associated with URIs that employ these schemes.

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## 1. Introduction

Presence and instant messaging are defined in [RFC2778](#) [5]. The Common Profiles for Presence (CPP [2]) and Instant Messaging (CPIM [1]) define two URI schemes: 'im' for INSTANT INBOXes and 'pres' for PRESENTITIES. This document provides rules for locating the resources associated with URIs that employ these schemes via the Domain Name Service [4]. These rules could no doubt be applied to the resolution of other URI schemes that are unrelated to instant messaging and presence.

CPIM and CPP both specify operations that have 'source' and 'destination' attributes. While only the semantics, not the syntax, of these attributes are defined by CPIM and CPP, many instant messaging and presence protocols today support the use of URIs to reflect the source and destination of their operations. The 'im' and 'pres' URI schemes allow such protocols to express the identities of the principals associated with a protocol exchange. When these operations pass through a CPIM or CPP gateway, these URIs could be relayed without modification, which has a number of desirable properties for the purposes of interoperability.

These URI schemes are also useful in cases where no CPIM/ CPP gatewaying will occur. If a particular principal's endpoint supports multiple instant messaging applications, for example, then a domain that identifies that host might use the sort of DNS records described in this document in order to provide greater compatibility with clients that support only one instant messaging protocol. A client would look up the record corresponding to the supported protocol, and learn how to contact the endpoint for that protocol. The principal in this instance would use an IM URI as their canonical address.

In some architectures, these URIs might also be used to locate a CPIM or CPP gateway that serves a particular domain. If a particular IM service provider wishes to operate CPIM/ CPP gateways in its own domain that map standard Internet protocols to an internal proprietary protocol, that gateway could be identified by an IM URI. In that case, the DNS records used to dereference the IM URI would serve a purpose similar to that of MX records.

The system described in this document relies on the use of DNS SRV [7] records and A records.

## 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](#) [3] 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.

### **3. Address Resolution**

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

Only resolvable, fully-qualified, domain names (FQDNs) are permitted when domain names are used in an IM URI (i.e., domain names that can be resolved to SRV [7] or A RRs).

### **4. Domain Name Lookup**

Once a client lexically identifies a domain to which instant messaging or presence operations will be delivered for processing, a DNS lookup **MUST** be performed to resolve the domain. The names **MUST** be fully-qualified domain names (FQDNs) -- mechanisms for inferring FQDNs from partial names or local aliases are a local matter.

The lookup first attempts to locate SRV RRs associated with the domain. If a CNAME RR is found instead, the resulting domain is processed as if it were the initial domain.

If one or more SRV RRs are found for a given domain, a sender **MUST NOT** utilize any A RRs associated with that domain unless they are located using the SRV RRs. If no SRV RRs are found, but an A RR is found, then the A RR is treated as if it was associated with an implicit SRV RR, with a preference of 0, pointing to that domain.

### **5. Processing SRV RRs**

Taking the IM URI for a concrete example, a lookup is performed for SRVs for the target domain and a desired IM transfer protocol.

For example, if the destination INSTANT INBOX is "im:fred@example.com", and the sender wishes to use an IM transfer protocol called "SIP", then a SRV lookup is performed for:

`_im._sip.example.com.`

The returned RRs, if any, specify the next-hop server.



The choice of IM transfer protocol is a local configuration option for each system.

Receiving systems that are registered for this DNS-based SRV resolution service list the transfer protocols by which they can be reached, either directly or through a translating gateway. The transfer-time choice of the IM transfer protocol to be used (and, therefore, to be resolved) is a local configuration option for each sending system.

Using this mechanism, seamless routing of IM traffic is possible, regardless of whether a gateway is necessary for interoperation. To achieve this transparency, a separate RR for a gateway must be present for each transfer protocol and domain pair that it serves.

The same logic is used for PRES URIs.

## **6. Processing Multiple Addresses**

When the lookup succeeds, the mapping can result in a list of alternative delivery addresses rather than a single address, because of multiple SRV records, multihoming, or both. For reliable operations, the client **MUST** be able to try each of the relevant addresses in this list in order, until a delivery attempt succeeds. However, there **MAY** also be a configurable limit on the number of alternate addresses that can be tried. In any case, the client **SHOULD** try at least two addresses. Two types of information are used to rank the domain addresses: multiple SRV records, and multihomed domains.

Multiple SRV records contain a preference indication that **MUST** be used in sorting. Lower numbers are preferable to higher ones. If there are multiple destinations with the same preference, and there is no clear reason to favor one (e.g., by recognition of an easily-reached address), then the sender **MUST** randomize them to spread the load across multiple servers for a specific destination.

The destination domain (perhaps taken from the preferred SRV record) may be multihomed, in which case the resolver will return a list of alternative IP addresses. It is the responsibility of the resolver to have ordered this list by decreasing preference if necessary, and the sender **MUST** try them in the order presented.

## **7. Security Considerations**

The usage of IM and PRES URIs, and the DNS procedures in this document, introduce no security considerations beyond those described in the requirements for instant messaging and presence ([6]) and the SRV specification ([7]).





## **8. IANA Considerations**

This document introduces no new considerations for IANA.

## **9. Contributors**

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