

A Telephone Number Mapping (ENUM) Service Registration for  
Instant Messaging (IM) Services

Status of This Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

Abstract

This document registers a Telephone Number Mapping (ENUM) service for Instant Messaging (IM). Specifically, this document focuses on provisioning 'im:' URIs (Uniform Resource Identifiers) in ENUM.

1. Introduction

ENUM (E.164 Number Mapping, RFC 3761 [1]) is a system that uses DNS (Domain Name Service, RFC 1034 [2]) to translate telephone numbers, such as '+12025550100', into URIs (Uniform Resource Identifiers, RFC 3986 [3]), such as 'im:user@example.com'. ENUM exists primarily to facilitate the interconnection of systems that rely on telephone numbers with those that use URIs to identify resources.

Instant Messaging (IM) is a service defined in RFC 2778 [6] that allows users to send and receive typically short, often textual messages in near real-time. The IETF has defined a generic URI used to identify an IM service for a particular resource: the 'im:' URI scheme (defined in RFC 3861 [4]). RFC 3861 [4] also defines rules for discovering service running specific protocols, such as SIP (the Session Initiation Protocol, RFC 3261 [8]) and XMPP (the eXtensible Messaging and Presence Protocol, RFC 3921 [9]) from a specific 'im:' URI.

RFC 3953 [10] already defines an enumservice for presence services, which returns 'pres:' URIs (also defined in RFC 3861 [4]). This document registers an enumservice for advertising IM information associated with an E.164 number.

## 2. ENUM Service Registration - im

As defined in RFC 3761 [1], the following is a template covering information needed for the registration of the enumservice specified in this document:

Enumservice Name:

"im"

Enumservice Type:

"im"

Enumservice Subtypes:

N/A

URI scheme(s):

"im:"

Functional Specification:

This Enumservice indicates that the resource identified is an 'im:' URI. The 'im:' URI scheme does not identify any particular protocol that will be used to handle instant messaging receipt or delivery, rather the mechanism in RFC 3861 [4] is used to discover whether an IM protocol supported by the party querying ENUM is also supported by the target resource.

Security considerations:

See section 3.

Intended usage:

COMMON

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## 3. Security Considerations

The Domain Name System (DNS) does not make policy decisions about which records it provides to a DNS resolver. All DNS records must be assumed to be available to all inquirers at all times. The information provided within an ENUM record set must therefore be considered open to the public -- which is a cause for some privacy considerations.

Revealing an 'im:' URI by itself is unlikely to introduce many privacy concerns, although, depending on the structure of the URI, it might reveal the full name or employer of the target. The use of anonymous URIs mitigates this risk.

As ENUM uses DNS, which in its current form is an insecure protocol, there is no mechanism for ensuring that the answer returned to a query is authentic. An analysis of threats specific to the dependence of ENUM on the DNS is provided in RFC 3761, and a thorough analysis of threats to the DNS itself is covered in RFC 3833 [11]. Many of these problems are prevented when the resolver verifies the

authenticity of answers to its ENUM queries via DNSSEC [5] in zones where it is available.

More serious security concerns are associated with potential attacks against an underlying Instant Messaging system (for example, message forgery and tampering). For this reason, IM protocols have a number of security requirements (detailed in RFC 2779 [7]) that call for authentication, integrity and confidentiality properties, and similar measures to prevent such attacks. Any instant messaging protocol used in conjunction with the 'im:' URI scheme is required to meet these requirements.

Unlike a traditional telephone number, the resource identified by an 'im:' URI may require that callers provide cryptographic credentials for authentication and authorization before instant messages are exchanged. In concert with instant messaging protocols, ENUM can actually provide far greater protection from unwanted callers than does the existing PSTN, despite the public availability of ENUM records.

#### 4. IANA Considerations

This document requests registration of the "im" Enumservice according to the definitions in this document and RFC 3761 [1].

#### 5. References

##### 5.1. Normative References

- [1] Faltstrom, P. and M. Mealling, "The E.164 to Uniform Resource Identifiers (URI) Dynamic Delegation Discovery System (DDDS) Application (ENUM)", RFC 3761, April 2004.
- [2] Mockapetris, P., "Domain names - concepts and facilities", STD 13, RFC 1034, November 1987.
- [3] Berners-Lee, T., Fielding, R., and L. Masinter, "Uniform Resource Identifier (URI): Generic Syntax", STD 66, RFC 3986, January 2005.
- [4] Peterson, J., "Address Resolution for Instant Messaging and Presence", RFC 3861, August 2004.
- [5] Arends, R., Austein, R., Larson, M., Massey, D., and S. Rose, "Protocol Modifications for the DNS Security Extensions", RFC 4035, March 2005.

## 5.2. Informative References

- [6] Day, M., Rosenberg, J., and H. Sugano, "A Model for Presence and Instant Messaging", RFC 2778, February 2000.
- [7] Day, M., Aggarwal, S., Mohr, G., and J. Vincent, "Instant Messaging / Presence Protocol Requirements", RFC 2779, February 2000.
- [8] Rosenberg, J., Schulzrinne, H., Camarillo, G., Johnston, A., Peterson, J., Sparks, R., Handley, M., and E. Schooler, "SIP: Session Initiation Protocol", RFC 3261, June 2002.
- [9] Saint-Andre, P., Ed., "Extensible Messaging and Presence Protocol (XMPP): Instant Messaging and Presence", RFC 3921, October 2004.
- [10] Peterson, J., "Telephone Number Mapping (ENUM) Service Registration for Presence Services", RFC 3953, January 2005.
- [11] Atkins, D. and R. Austein, "Threat Analysis of the Domain Name System (DNS)", RFC 3833, August 2004.

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