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**Recommended Relationships between Different Types of Identifiers.
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Abstract

Evolution of communications technologies brought us various types of identifiers or addresses that identify persons such as SIP URIs, email addresses, and telephone numbers. Proper relationships among different type of identifiers can enable various services, which, otherwise, are difficult to realize. This memo provides guidelines for managing relationships between SIP URIs other personal identifiers.

1. Introduction

In the absence of widely-deployed public directories, users often have only partial information about the various communication URI schemes for people they are trying to reach. They might have an old business card or RFC, typically containing a phone number or email address, but may need to contact the individual by some other means, such as via SIP or XMPP. Usage of newer protocols is facilitated if a communicating party is likely to be able to obtain such addresses.

A number of communications-related URIs, such as for email [\[4\]](#) [\[5\]](#), SIP [\[1\]](#) and XMPP [\[6\]](#) use the basic 'user@host' form. Particularly since implementations often allow usage of such identifiers without prefixing it with the URI scheme, non-technical users expect these identifiers to work across different means of communication and, in particular, expect that they reach the same person if they do work.

In some cases, if a SIP or other presence-related address such as an xmpp URI is known, one can try to subscribe to that address, with the presence object possibly returning the email address. However, this is not likely to work consistently, particularly since revealing presence information requires more trust than simply revealing one's email address.

Thus, given the limitations of electronic means of relating different communications-related URI schemes for individuals and services, users are likely to guess. Communication is facilitated and communication failures are prevented if identifiers are constructed in a predictable and consistent manner.

This document makes two core recommendations:

- (1) Individuals should be able to choose user identifiers across URI schemes that are the same.
- (2) Assignment policies within a domain should not assign the same user part in different URI schemes to different individuals.

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 [BCP 14](#), [RFC 2119](#) [\[2\]](#).

SIP URI: Uniform Resource Indicators identifying communication resources for SIP as defined in [Section 19](#), RFC 3261 [1].

Its general form is:

sip:user:password@host:port;uri-parameters?headers.

SIPS URI: Same as SIP URI except that the SIP protocol runs on top of the Transport Layer Security (TLS) protocol [3]. It is also defined in [Section 19](#), RFC 3261 [1]. Its general form is the same as the SIP URI except that it starts with 'sips:' rather than 'sip:'.

SIP address: A SIP URI or SIPS URI.

telephone number: A string of decimal digits that uniquely indicates the network termination point. The string contains the information necessary to route the call to this point. There are two categories of telephone numbers: public telephone numbers and private telephone numbers. This definition is from [RFC 3966](#) [7] which derived the definition from [11].

tel URI: A resource identifier from a telephone number as defined in [RFC 3966](#)[7].

email address: A character string that identifies a user to whom mail will be sent or a location into which mail will be deposited. The standard email address naming convention is defined to be "user@host". A more rigorous definition can be found in [RFC2821](#) [4] and [RFC2822](#) [5].

3. Recommended Practices

3.1 A SIP address and an email address with the same user and domain parts

A SIP address MUST NOT have the same user and domain parts as an email address unless both refer to the same person or service.

Therefore, a SIP address and an email address with the same user and domain parts MUST refer to the same person or service. For example, the following SIP address and email address

sip:bob@example.com:5060;transport=udp

(mailto:)bob@example.com

MUST refer to the same person.

3.2 Two SIP addresses with the same user and domain parts

Any two SIP addresses MUST NOT have the same user and domain parts unless both refer to the same person or service.

For example, the following SIP addresses

```
sip:bob@example.com:5060;transport=udp
```

```
sips:bob@example.com;transport=tcp
```

MUST refer to the same person or service even though they are not equivalent according to the SIP specification [\[1\]](#) .

3.3 A SIP address and its email-equivalent

All SIP addresses SHOULD have a working email-equivalent as long as the SIP addresses are referring to people.

For example, for the following SIP address

```
sip:bob@example.com:6000;transport=tcp
```

a working email-equivalent SHOULD exist, such as

```
(mailto:)bob_the_builder@example.net.
```

The above example illustrates that the working email-equivalent does not have to have the same user and domain parts as the SIP address. How to find the email-equivalent for a given SIP address is out of scope.

If a SIP address refers to a telephone (number), it MAY not have an email-equivalent.

3.4 A tel URI and its email-equivalent

A tel URI MAY not have an email-equivalent.

3.5 An email address and its SIP-equivalent

Some email addresses may not have SIP equivalents, e.g., because the domains don't support SIP services.

3.6 Email user names and SIP user parts

Providers of SIP services SHOULD allow all valid email user names as SIP address user parts.

3.7 A telephone number and its SIP-equivalent

Telephone numbers are mapped to SIP URIs without visual separators (hyphen, etc.), as partially described in the tel URI RFC [7] and the SIP RFC [1]. The parameter 'user' with its value 'phone' SHOULD be included in the SIP URIs.

For example, the following public telephone number

+1-212-555-1234

is mapped to the following SIP URI

sip:+12125551234;user=phone.

4. Use Cases

Below are just two example use cases showing the benefits that can be accrued by the recommended relationships in the above.

4.1 Leaving voicemails using emails in P2P IP telephony systems

Let say there are two identifiers, a SIP URI sip:bob@example.com and an email address bob@example.com. Imagine that there is no voicemail server associated with sip:bob@example.com and the human user owning the SIP URI could not take a call when another user called at the URI. It would be very useful if the caller can leave a voicemail by email. This scenario is particularly useful when SIP UAs are operating in a peer-to-peer fashion. Peer-to-peer networks for SIP-based communications were discussed recently in several drafts [8][9][10]. If the email address bob@example.com is assigned to the same person owning sip:bob@example.com by a global rule, it is straightforward to which email address the voicemail should be emailed. Instead, if the email address bob@example.com happens to be assigned to a different person, the caller will end up leaving the voicemail to a wrong person.

4.2 Common authentication for IP telephony and email systems

An organization, in their deployment of a SIP-based IP telephony system, set a policy that the SIP URI and the email address with the same user information and the host information components, i.e.

identical except the protocol component should be assigned only to the same user and let the users use their email system usernames and passwords for authentication with the IP telephony system, reducing the administration overhead and increasing the convenience of users at the same time.

5. Security Considerations

One could argue that making identifiers the same across communication means is likely to increase undesirable communication, such as spam. However, communication identifiers are often short and easily guessable, so that those intent on sending spam can exhaustively search the namespace until a working address has been found. Similarly, a single instance of an address "leaked" on a web page is often sufficient to introduce the address into the pool of spam-receiving addresses. Thus, the protection of address hiding appears to be limited, but the negative impact on desirable communication is clear. It is not the role of this document to force users to make such a trade-off between the possible benefits of address hiding and easier reachability, but rather to facilitate such choice.

This document therefore does not require that users choose the same 'user' part, but suggests that providers of such services make it easy for users to choose such a convention.

Preventing two users to share the same identifiers across URIs increases security, as it makes it less likely that a user sends confidential information to the wrong destination, in the mistaken belief that they are owned by the same person.

6. Acknowledgments

Arjun Roychowdhury's comments are appreciated.

7. References

7.1 Normative References

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