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Presence and Instant Messaging Peering Use Cases

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Abstract

This document describes several use cases of peering of non-VoIP (Voice over IP) services between two or more Service Providers. These Service Providers create a peering relationship between themselves, thus enabling their users to collaborate with users on the other Service Provider network. The target of this document is to drive requirements for peering between domains that provide the non-VoIP based collaboration services with presence and, in particular, Instant Messaging (IM).

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1. Introduction

This document uses the terminology as defined in [1] unless otherwise stated.

Real Time Collaboration (RTC) services have become as prevalent and essential for users on the Internet as email. While RTC services can be implemented directly by users in a point-to-point fashion, they are often provided for, or on behalf of, a Peer Network of users within an administrative domain. As the use of these services grows, users increasingly have the need to communicate with users not only within their own Peer Network but with those in other Peer Networks as well (similar to the old Public Switched Telephony Network (PSTN) that enabled global reachability). In practice, each Peer Network is controlled by some domain, and so there is a need to provide for easier establishment of connectivity between Peer Networks and for the management of the relationships between the Peer Networks. This document describes a set of use cases that describe how peering between Peer Networks may be used in non-VoIP RTC services. The use cases are intended to help in identifying and capturing requirements that will guide and then enable a secure and easier peering between Peer Networks that provide non-VoIP RTC services. The use cases for the VoIP RTC services are described in [2].

Note that this document does not define requirements for a new protocol or for protocol extensions. It captures the way that presence and Instant Messaging are currently used within enterprises and operator domains.

2. Use Cases

2.1. Simple Interdomain Subscription

Assume two Peer Networks, Peer Network A and Peer Network B. User Alice@example.com (hosted in Peer Network A) wants to subscribe to user Bob@example.net (hosted in Peer Network B) and get his presence information. In order to do so, Alice@example.com could connect directly to example.net and subscribe to Bob's presence information. However, Peer Network B is willing to accept subscriptions and route IMs only when they are coming from its users or from other Peer Networks that Peer Network B trusts.

In reality, what will happen is Peer Network A will connect to Peer Network B and send Alice's subscription to Bob via Peer Network B. When Peer Network B has new information on Bob, it will send notifications to Peer Network A, which will pass them to Alice.

2.2. List-Based Interdomain Subscription

This is similar to the simple interdomain subscription use case, except in this case Alice subscribes to a Uniform Resource Identifier (URI) [8] that represents a list of users in Peer Network B [9] [3].

There are several types of lists that Alice may subscribe to:

- Personal group - a list that is created and maintained by Alice and includes Alice's watch list.
- Public group - a list that is created and maintained by an administrator. Public groups usually contain a list of specific people that have some common characteristic, e.g., support group of a company.
- Ad-hoc group - a list that is short lived and is usually created in the context of some activity that Alice is doing. An ad-hoc group may be created by Alice or by some application. Typical examples may be the list of people that participate with Alice in a conference or a game.

2.3. Authorization Migration

If many users from one Peer Network watch presentities [6] in another Peer Network, it may be possible that many watchers [6] from one Peer Network will subscribe to the same user in the other Peer Network. However, due to privacy constraints that enable a user to provide different presence documents to different watchers, each Peer Network will have to send multiple copies of the watched-presence document. The need to send multiple copies between the Peer Networks is very inefficient and causes redundant traffic between the Peer Networks.

In order to make the subscription between Peer Networks more efficient there needs to be a way to enable Peer Networks to agree to share privacy information between them. This will enable sending a single copy (the full copy) of the presence document of the watched user and letting the receiving Peer Network be responsible for sending the right values to the right watchers according to the delegated privacy policies of the watched users.

Instead of sharing the watched user's privacy policies between the Peer Networks, it is also possible to send different copies of the presence document with a list of the watchers the presence document is intended for. For example, if there is a set of watchers in one Peer Network that may see the location of the presentity and another set of users in the same Peer Network that

may not see the location information, two presence documents will be sent--each associated with a list of watchers that should receive it. One presence document will contain the location information and will be associated with a list of users that may see it, and the other presence document will not contain the location information and will be associated with a list of users that may not see the location information. See [11].

2.4. Pager Mode IM

In this use case, a user from one Peer Network sends a pager mode [7] IM to a user on another Peer Network.

2.5. Session Based IM

In this use case, a user from one Peer Network creates a Message Session Relay Protocol (MSRP) [10] session with a user from another Peer Network.

2.6. Other Services

In addition to VoIP sessions, which are out of scope for this document, only presence and IM have been ratified as RFCs. In addition to presence and IM, there are many other services that are being standardized or that may be implemented using minimal extensions to existing standards. These include:

- N-way chat - enable a multi-participant textual chat that will include users from multiple Peer Networks. See [4] for more details.

- File transfer - send files from a user in one Peer Network to a user in another Peer Network. See [5] for more details.

- Document sharing - sharing and editing a document between users in different Peer Networks.

  Note: Document sharing is mentioned in this document only for completeness of use cases. It is not being standardized by the IETF and will not be included in the requirements document that will result from this document.

The list above is of course not exhaustive, as new developments in the world of non-VoIP RTC will surface new services. Enabling peering between networks for some of the services will create a basis for enabling peering for future services also.

2.7. Federation and Clearing House

A federation as defined in [1] enables peering between multiple Peer Networks. A federation may be implemented by means of a central service providing a hub for the Peer Networks or, alternatively, Peer Networks may connect to each other in a peer-to-peer fashion. One of the most important services that this hub type of federation should provide is authorized interconnection that enables each Peering Network to securely identify other Peering Networks. Other services that might be provided include an N-way chat server, lawful interception, logging, and more. This hub type of federation is also known as a "Clearing House".

As non-VoIP services are usually text-based and consume less bandwidth, they may benefit from having a central service that will do central services such as logging for them. For example, instead of requiring each Peer Network to log all messages that are being sent to the other Peer-Network, this service can be done by the Clearing House.

3. Security Considerations

When Peer Network A peers with Peer Network B, there are several security issues for which the administrator of each Peer Network will need mechanisms to verify:

- All communication channels between Peer Networks and between each Peer Network and the Clearing House have their authenticity and confidentiality protected.
- The other Peer Network is really the Peering Network that it claims to be.
- The other Peer Network is secure and trustworthy, such that information that is passed to it will not reach a third party. This includes information about specific users as well as information about the authorization policies associated with user information.
- The other Peer Network is secure and trustworthy, such that it will not modify or falsify data that it presents to its users except as required by the authorization policy provided.
- If there is a third party (e.g., a Clearing House) involved in the connection between the two Peering Networks that element is also secure.

The same issues of security are even more important from the point of view of the users of the Peer Networks. Users will be concerned about how their privacy is being adhered to when their presence information is sent to the other Peer Network. Users today are concerned about providing their email address to a third party when they register to a domain; presence contains much more sensitive information, and the concern of users here will be even greater.

The privacy issue is even harder when we take into account that, in order to enable scalable peering between big Peer Networks, there are some optimizations that may require migration of the privacy definitions of users between Peer Network (see Section 2.3). We can imagine the fiasco that would ensue if a user of one Peer Network were able to see the privacy information and learn he/she is listed in the block list of a close friend.

This document discusses use cases for peering between Peer Networks. It is out of the scope of this document to provide solutions for security. Nevertheless, it is obvious that the protocols that will enable the use cases described here will have to provide for the security considerations also described here.

4. Acknowledgments

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