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IANA Registering a SIP Resource Priority Header Field Namespace for Local Emergency Communications

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Abstract

This document creates the new Session Initiation Protocol (SIP) Resource Priority header field namespace "esnet" for local emergency usage to a public safety answering point (PSAP), between PSAPs, and between a PSAP and first responders and their organizations, and places this namespace in the IANA registry.

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Table of Contents

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

1. Introduction

This document creates the new Session Initiation Protocol (SIP) Resource Priority header field namespace "esnet" for local emergency usage and places this namespace in the IANA registry. The SIP Resource-Priority header field is defined in RFC 4412 [RFC4412]. This new namespace is to be used within public safety answering point (PSAP) networks. This new namespace can be used for inbound calls towards PSAPs, between PSAPs, and between a PSAP and first responders or their organizations.

Within controlled environments, such as an IMS infrastructure or Emergency Services network (ESInet), where misuse can be reduced to a minimum because these types of networks have great controls in place, this namespace can be to provide an explicit priority indication that facilitates differing treatment of emergency SIP messages according to local policy, or more likely, a contractual agreement between the network organizations. This indication is used solely to differentiate SIP requests, transactions or dialogs, from other requests, transactions or dialogs that do not have the need for priority treatment. If there are differing, yet still valid Resource-Priority header values between SIP requests in a network, then this indication can be used by local policy to determine which SIP request, transaction or dialog receives which treatment (likely better or worse than another).

It can also be imagined that Application Service Providers (ASP)

directly attached to an ESInet can have a trust relationship with the ESInet such that within these networks, SIP requests (thereby the session they establish) make use of this "esnet" namespace for appropriate treatment.

This document merely creates the namespace, per the rules within [RFC4412], necessitating a Standards Track RFC for IANA registering new RPH namespaces and their relative priority-value order.

There is the possibility that within emergency services networks - provided local policy supports enabling this function - a Multilevel Precedence and Preemption (MLPP)-like behavior can be achieved (likely without the 'preemption' part, which will always be a matter of local policy, and defined here) - ensuring more important calls are established or retained, the "esnet" namespace is given 5 priority-levels. MLPP-like SIP signaling is not defined in this document for 911/112/999 style emergency calling, but it is not prevented either.

Within the ESINet, there will be emergency calls requiring different treatments, according to the type of call. Does a citizen's call to a PSAP require the same, a higher or a lower relative priority than a PSAP's call to a police department, or the police chief? What about either relative to a call from within the ESINet to a federal government's department of national security, such as the US Department of Homeland Security? For this reason, the "esnet" namespace is given multiple priority levels.

This document does not define any of these behaviors, outside of reminding readers that the rules of RFC 4412 apply - though examples of usage are included for completeness. This document IANA registers the "esnet" RPH namespace for use within emergency services networks, not just of those from citizens to PSAPs.

2. Rules of Usage of the Resource Priority Header field

This document retains the behaviors of the SIP Resource Priority header field, defined in [RFC4412], during the treatment options surrounding this new "esnet" namespace. The usage of the "esnet" namespace does not have a 'normal', or routine call level, given the environment this is to be used within (i.e., within an ESInet). That is for local jurisdictions to define within their respective parts of the ESInet- which could be islands of local administration.

RFC 4412 states that modifying the relative priority ordering or the number of priority-values to a registered namespace is not recommended across the same administrative domain, due to interoperability issues with dissimilar implementations.

Every use of this namespace will be in times of an emergency, where at least one end of the signaling is within a local emergency

organization.

The "esnet" namespace has 5 priority-values, in a specified relative priority order, and is a queue-based treatment namespace [RFC4412]. Individual jurisdictions MAY configure their SIP entities for preemption treatment. This is OPTIONAL, subject to local policy decisions.

Conceivably, this could be an example network diagram where the "esnet" namespace is used:

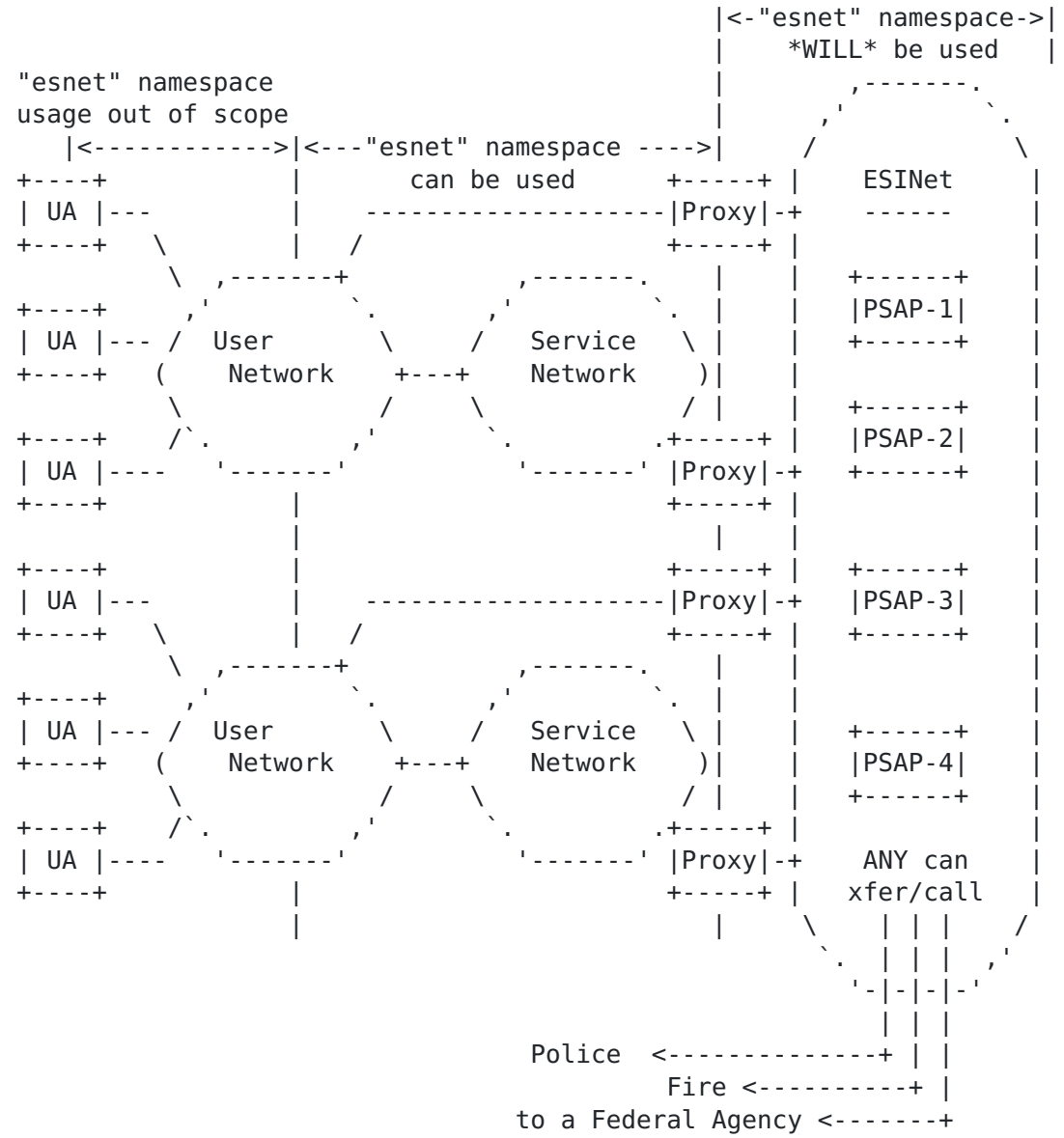

Figure 1: Where 'esnet' Namespace Can or Will be used

In Figure 1., the "esnet" namespace is intended for usage within the ESInet on the right side of the diagram. How it is specifically utilized is out of scope for this document, and left to local

jurisdictions to define. Adjacent ASPs to the ESInet MAY have a trust relationship that includes allowing this/these neighboring ASP(s) to use the "esnet" namespace to differentiate SIP requests and dialogs within the ASP's network. The exact mapping between the internal and external sides of the edge proxy at the ESInet boundaries is out of scope of this document.

To be clear, specifically for the use of an edge proxy in any network, because the "esnet" namespace is allowed to be modified or deleted at the edge proxy of the ESInet does not allow any edge proxy to modify or delete any other Resource-Priority namespace. This document's target market is for the "esnet" namespace only.

3. "esnet" Namespace Definition

One thing to keep in mind for now is the fact that this namespace is not to be considered just "EMERGENCY" because there are a lot of different kinds of emergencies, some on a military scale ([RFC4412] defines 3 of these), some on a national scale ([RFC4412] defines 2 of these), some on an international scale. These types of emergencies can also have their own namespaces, and although there are 45 defined for other uses, more are possible - so the 911/112/999 style of public user emergency calling for police or fire or ambulance (etc) does not have a monopoly on the word "emergency".

The namespace "esnet" has been chosen - roughly to stand for "Emergency Services NETwork", as it is most recognizable as that of citizen's call for help from a public authority type of organization. This namespace will also be used for communications between emergency authorities, and MAY be used for emergency authorities calling public citizens. An example of the later is a PSAP operator calling back someone who previously called 911/112/999 and the communication was terminated before it - in the PSAP operator's judgment - should have been.

Here is an example of a Resource-Priority header field using the "esnet" namespace:

```
Resource-Priority: esnet.0
```

3.1. Namespace Definition Rules and Guidelines

This specification defines one unique namespace for emergency calling scenarios, "esnet", constituting its registration with IANA. This IANA registration contains the facets defined in Section 9 of [RFC4412].

3.2. The "esnet" Namespace

Per the rules of [RFC4412], each namespace has a finite set of

relative priority-value(s), listed (below) from lowest priority to highest priority. In an attempt to not limit this namespace's use in the future, more than one priority-value is assigned to the "esnet" namespace. This document does NOT RECOMMEND which priority-value is used where. That is for another document to specify. This document does RECOMMEND the choice within a national jurisdiction is coordinated by all sub-jurisdictions to maintain uniform SIP behavior throughout an emergency calling system of that country.

The relative priority order for the "esnet" namespace is as follows:

```
(lowest)  esnet.0
          esnet.1
          esnet.2
          esnet.3
(highest) esnet.4
```

The "esnet" namespace will be assigned into the priority queuing algorithm (Section 4.5.2 of [RFC4412]) from the public user to the PSAP. This does not limit its usage to only the priority queue algorithm; meaning the preemption algorithm is a policy decision for local jurisdictions. This document is not RECOMMENDING this usage, merely pointing out those behaviors is a matter of local policy.

The rules originated in RFC 4412 remain with regard to an RP actor, who understands more than one namespace, MUST maintain its locally significant relative priority order.

4. IANA Considerations

4.1 IANA Resource-Priority Namespace Registration

Within the "Resource-Priority Namespaces" of the sip-parameters section of IANA (created by [RFC4412]), the following entries will be added to this table:

Namespace	Levels	Intended Algorithm	New warn-code	New resp. code	Reference
esnet	5	queue	no	no	[This doc]

4.2 IANA Priority-Value Registrations

Within the Resource-Priority Priority-values registry of the sip-parameters section of IANA, the following (below) is to be added to the table:

Namespace: esnet

Reference: (this document)
Priority-Values (least to greatest): "0", "1","2", "3", "4"

5. Security Considerations

The Security considerations that apply to RFC 4412 [RFC4412] apply here.

The implications of using this namespace within the Resource-Priority header field incorrectly can cause a large impact on a network - given that this indication is to give preferential treatment of marked traffic great preference within the network than other traffic. This document does not indicate this marking is intended for use by endpoints, yet protections need to be taken to prevent granting preferential treatment to unauthorized users not calling for emergency help.

A simple means of preventing this usage into an ESInet is to not allow "esnet" marked traffic to get preferential treatment unless the destination is towards the local/regional ESInet. This is not a consideration for internetwork traffic within the ESInet, or generated out of the ESInet. 911/112/999 type of calling is fairly local in nature, with a finite number of URIs that are considered valid.

6. Acknowledgements

Thanks to Ken Carlberg, Janet Gunn, Fred Baker and Keith Drage for help and encouragement with this effort. Thanks to Henning Schulzrinne, Ted Hardie, Hannes Tschofenig, Brian Rosen, Janet Gunn and Marc Linsner for constructive comments.

7. References

7.1 Normative References

[RFC2119] S. Bradner, "Key words for use in RFCs to Indicate Requirement Levels", RFC 2119, March 1997

[RFC4412] Schulzrinne, H., Polk, J., "Communications Resource Priority for the Session Initiation Protocol (SIP)", RFC 4411, Feb 2006

7.2 Informative References

none

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