          IANA Registering a SIP Resource Priority Header Field
               Namespace for Local Emergency Communications
                 draft-polk-local-emergency-rph-namespace-04

Abstract

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

Status of this Memo

   This Internet-Draft is submitted in full conformance with the
   provisions of BCP 78 and BCP 79.

   Internet-Drafts are working documents of the Internet Engineering
   Task Force (IETF). Note that other groups may also distribute
   working documents as Internet-Drafts. The list of current Internet-
   Drafts is at http://datatracker.ietf.org/drafts/current/.

   Internet-Drafts are draft documents valid for a maximum of six
   months and may be updated, replaced, or obsoleted by other documents
   at any time. It is inappropriate to use Internet-Drafts as
   reference material or to cite them other than as "work in progress."

   This Internet-Draft will expire on August 15, 2013.

Table of Contents

1. Introduction

   This document creates the new Session Initiation Protocol (SIP)
   Resource Priority header (RPH) 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]. The new "esnet" namespace is to be used for inbound calls
   towards a public safety answering point (PSAP), between PSAPs, and
   between a PSAP and first responders or their organizations within
   managed IP networks. This namespace is not for use on the open
   public Internet because it can be trivially forged.

   Adding a RPH with the "esnet" namespace can be differentiated from
   the marking of an emergency call using a service urn as defined in
   RFC 5031 in that the RPH specifically requests preferential
   treatment in networks which honor it, while the marking merely
   identifies an emergency call without necessarily affecting resources
   allocated to it. It is appropriate to use both where applicable.
   RPH with "esnet" may also be used within public safety networks for
   SIP sessions that are not emergency calls and thus not marked per
   RFC 5031.

   This new namespace is included in SIP requests to provide an
   explicit priority indication within controlled environments, such as
   an IMS infrastructure or Emergency Services network (ESInet) where
   misuse can be reduced to an acceptable level because these types of
   networks have controls in place. The function facilitates differing
   treatment of emergency SIP requests according to local policy, or
   more likely, a contractual agreement between the network
   organizations. This indication is used solely to differentiate
   certain SIP requests, transactions or dialogs, from other SIP

requests, transactions or dialogs that do not have the need for
priority treatment. If there are differing, yet still
understandable and valid Resource-Priority header values in separate

SIP requests, 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).

Application Service Providers (ASP) and ESInets that interact need to specifically trust one another to correctly use this header.

The "esnet" namespace may also be used on calls from a PSAP or other public safety agency on an ESInet towards a private or public network, ASP or UA ("call back") when priority is needed. Again, the request for priority is not for use on the public Internet due to the ease of forging the header.

This document merely creates the namespace, per the rules within [RFC4412] as updated by [draft-rosen-rph-reg-policy], necessitating IETF review for IANA registering new RPH namespaces and their relative priority-value order.

There is the possibility that within emergency services networks a Multilevel Precedence and Preemption (MLPP)-like behavior can be achieved (likely without the 'preemption' part), provided local policy supports enabling this function. For example, calls placed between law enforcement agents could be marked similarly to MLPP systems used by military networks, and some of those calls could be handled with higher priority than an emergency call from an ordinary user. Therefore the "esnet" namespace is given five priority-levels instead of just one. 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 national government's department responsible for public safety, disaster relief, national security/defense, etc.? For these additional reasons, the "esnet" namespace was 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 any emergency services networks, not just of those from citizens to PSAPs.

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].

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 left for local jurisdictions to define within their
respective parts of the ESInet, which could be islands of local
administration.

The "esnet" namespace MUST only be used where at least one end of
the signaling, setting aside the placement of B2BUAs, is within a
local emergency organization. In other words, if either the
originating human caller's UA, or the destination human callee's UA
is part of the local emergency organization, this is a valid use of
"esnet".

The "esnet" namespace has 5 priority-values, in a specified relative
priority order, and is registered as a queue-based namespace in
compliance with [RFC4412]. SIP entities that support preemption
treatment (see Section 5 of [RFC4412]) can be configured according
to local policy. Display names for the "esnet" values displayed can
likewise be set according to local policy.

The following network diagram provides one example of local policy
choices for the use of the "esnet" namespace:

```
                                        |<-"esnet" namespace->|
                                        |          is used    |
       "esnet" namespace                |          ,-------.
       usage out of scope               |        ,'         `.
         |<------------>|<---"esnet" namespace ---->|     /            \
       +----+           |        can be used    +-----+ |   ESInet     |
       | UA |---         |    ------------------|Proxy|-+   ------      |
       +----+   \        |   /                   +-----+ |              |
              \  ,------+          ,-------.      |   |   +------+       |
       +----+    ,'        `.     ,'         `. |   |   |PSAP-1|       |
       | UA |--- /   User      \    / Application \ |   |   +------+       |
       +----+   (     Network    +---+    Service    )|   |               |
              \              /    \   Provider  / |   |   +------+       |
       +----+   /`.         ,'       `.        .+-----+ |   |PSAP-2|       |
       | UA |----   '-------'           '-------' |Proxy|-+   +------+       |
       +----+           |                         +-----+ |               |
                        |                           |   |               |
       +----+           |                         +-----+ |   +------+       |
       | UA |---         |    ------------------|Proxy|-+   |PSAP-3|       |
       +----+   \        |   /                   +-----+ |   +------+       |
              \  ,------+          ,-------.      |   |               |
       +----+    ,'        `.     ,'         `. |   |               |
       | UA |--- /   User      \    / Application \ |   |   +------+       |
       +----+   (     Network    +---+    Service    )|   |   |PSAP-4|       |
              \              /    \   Provider  / |   |   +------+       |
       +----+   /`.         ,'       `.        .+-----+ |               |
       | UA |----   '-------'           '-------' |Proxy|-+   ANY can      |
       +----+           |                         +-----+ |   xfer/call   |
                        |                           |   \   | | |   /
                        |                                `. | | | ,'
                                                       '-|-|-|-'
                                                          | | |
                              Police  <-------------+ | |
                                     Fire <----------+ |
                                 National Agency <-------+
```
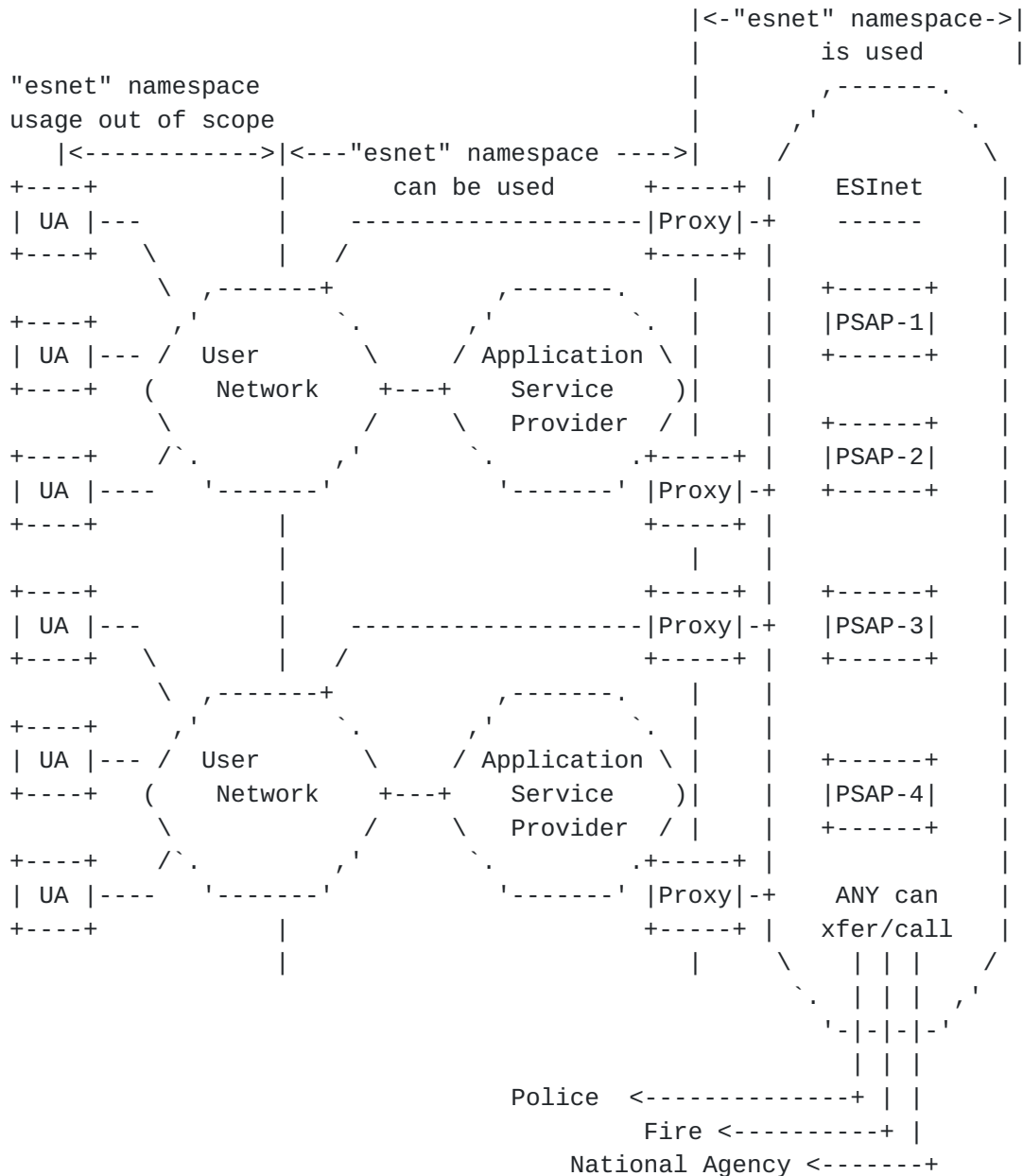
   Figure 1: A possible network architecture using "esnet" namespace

   In Figure 1., the "esnet" namespace is used 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. Whether preemption is implemented in the ESInet and the
   values displayed to the ESInet users, is likewise out of scope.
   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.

3. "esnet" Namespace Definition

   The "esnet" namespace is not generic for all emergencies 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. Each type of emergency can also have its own namespace(s),
   and although there are 45 defined for other uses (5 in [RFC4412] and
   40 in [RFC5478]), 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", for a 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 the ESInet to emergency authorities calling public
   citizens. An example of the latter 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 in which situation or scenario. That
   is for another document to specify. To be effective, the choice
   within a national jurisdiction needs to be coordinated by all
   sub-jurisdictions to maintain uniform SIP behavior throughout an
   emergency calling system of that nation

   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 in the priority queuing algorithm
(Section 4.5.2 of [RFC4412]). Although no preemption is specified
in this document for any levels of esnet, local jurisdiction(s) MAY
configure their SIP infrastructure to use this namespace with
preemption, as defined in RFC 4412.

The remaining rules originated in RFC 4412 apply with regard to an
RP actor who understands more than one namespace, and is 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.

For networks that act on the SIP Resource-Priority header field,
an incorrect use of a namespace can result in traffic that should
have been given preferential treatment not be given it and vice
versa. This document does not define a use case where an endpoint
outside the ESInet marks its call for preferential treatment.
Protections need to be taken to prevent granting preferential

treatment to unauthorized users not calling for emergency help even
if they are in the ESInet, as well as to prevent misuse by callers

outside the ESInet.

A simple means of preventing this usage in 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 likely to be considered valid within a portion of a network receiving SIP signaling.

This namespace is not intended for use on the Internet because of the difficulty in detecting abuse. Some networks may determine that it can reasonably prevent abuse and/or the consequences of undetected abuse is not significant. In such cases, use of esnet MAY be allowed.

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. A big thanks to Robert Sparks for being patient with the author.

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 4412, Feb 2006

[RFC5031] H. Schulzrinne, "A Uniform Resource Name (URN) for Emergency and Other Well-Known Services", RFC 5031, January 2008

[RFC5478] J. Polk, "IANA Registration of New Session Initiation Protocol (SIP) Resource-Priority Namespaces", RFC 5478, March 2009

[draft-rosen-rph-reg-policy] Rosen, B, "Resource-Priority Header Registry Policy to IETF Review, draft-rosen-rph-policy-00 (work in progress), Feb 2013

7.2 Informative References

Author's Address

   James Polk
   3913 Treemont Circle
   Colleyville, Texas   76034
   USA
   Phone: +1-817-271-3552
   Email: jmpolk@cisco.com