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**Emergency Services URI for the Session Initiation Protocol  
draft-ietf-sipping-sos-02**

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Abstract

As part of an overall architecture for supporting emergency calling for the Session Initiation Protocol (SIP), this document defines universal emergency SIP URIs, sip:sos@domain and sips:sos@domain, that allows SIP user agents to contact the local emergency call center. It also defines conventions that increase the high probability of reaching the appropriate emergency call center. The document does not define any SIP protocol extensions.

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## 1. Introduction

Using the public switched telephone network (PSTN), emergency help can often be summoned at a designated, widely known number, regardless of where the telephone was purchased. However, this number differs between localities, even though it is often the same for a country or continent-size region (such as many countries in the European Union or North America). For end systems based on the Session Initiation Protocol (SIP) [RFC3261], it is desirable to have a universal identifier, independent of location, to simplify the user experience and to allow the device to perform appropriate processing. Here, we define a common user identifier, "sos", as the contact mechanism for emergency assistance. This identifier is meant to be used in addition to any local emergency numbers.

This document specifies only a small part of a comprehensive set of recommendations for operating emergency services. Future documents will describe how a device that identifies a call as an emergency call can route it to the appropriate Public Safety Answering Point (PSAP).

This document does not introduce any new SIP header fields, request methods, status codes, message bodies, or events. User agents unaware of the recommendations in this draft can place emergency calls, but may not be able to provide the same user interface functionality. The document suggests behavior for proxy servers, in particular outbound proxy servers.

The solution described here is not as general as the alternative approach, service URNs [I-D.schulzrinne-sipping-service], but requires no changes to end systems or proxies.

## 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 [RFC2119] and indicate requirement levels for compliant implementations.

## 3. Emergency URIs

Having a single, global identifier for emergency services is highly desirable, as it allows end system and network devices to be built that recognize such services and can act appropriately. Such actions may include restricting the functionality of the end system, providing special features, overriding user service constraints or routing session setup messages.

SIP user agents (UAs) that determine that a dialog or transaction relates to an emergency MUST use an emergency SIP URI defined below as the Request-URI and "To" header field.

It is RECOMMENDED that SIP-based [RFC3261] end systems and proxy servers support a uniform emergency call identifier, namely the SIP and SIPS URIs with the reserved user name "sos" within any domain, e.g.,

```
sip:sos@example.com
sips:sos@example.com
```

The reserved name is case-insensitive.

The host part of the emergency URI SHOULD be the host portion of the address-of-record of the caller. The "sips" form SHOULD be used to ensure integrity and confidentiality; the "sip" form MAY be used if a "sips" call fails with status code 416 (Unsupported URI Scheme). All SIP requests with URIs of this form are assumed to be emergency calls.

The domain-of-record was chosen since a SIP user agent may not be able to determine the local domain it is visiting. This also allows each user to test this facility, as the user can ensure that such services are operational in his home domain. An outbound proxy in the visited domain can handle the call if it believes to be in a position to provide appropriate emergency services.

In some cases, end users or, more likely, emergency service routing proxies may want to request specific emergency services. We support this feature by leveraging the caller preferences [RFC3841] extension and define a new media feature tag, service, in Section 6.

The SIP URI user name "sos" MUST NOT be assigned to any regular user.

#### 4. Request Handling

Outbound proxy servers SHOULD check whether a tel URIs or a SIP URIs containing a dial string represents an emergency number within its geographic service area, but only if they can be reasonably certain that the call originated from within that area, e.g., if the call contained location information or the network is known to only be reachable from a restricted geographic area. Typically, these service areas encompass whole countries since many countries now have nationwide emergency numbers. Once they recognize an emergency number, they translate the Request-URI to an "sos" URI as described above.

The proxy MAY use any additional information contained in the call request to recognize additional numbers as emergency numbers. Such information includes the Mobile Country Code and the Mobile Network Code for 3GPP devices or country information in location information available about the call.

## 5. Alternative Approaches Considered

The "sos" SIP URI reserved user name proposed here follows the convention of RFC 2142 [RFC2142] and the "postmaster" convention documented in RFC 2822 [RFC2822]. The approach has the advantage that only the home proxy for a user needs to understand the convention and that the mechanism is likely backwards-compatible with most SIP user agents, with the only requirement that they have to be able to generate alphanumeric URLs. One drawback is that it may conflict with locally assigned addresses of the form "sos@domain". Also, if proxies not affiliated with the domain translate the URL, they violate the current SIP protocol conventions.

There are a number of possible alternatives, each with their own set of advantages and problems:

tel:NNN;context=+C This approach uses tel URIs [RFC3966]. Here, NNN is the national emergency number, where the country is identified by the context C. This approach is easy for user agents to implement, but hard for proxies and other SIP elements to recognize, as it would have to know about all number-context combinations in the world and track occasional changes. In addition, many of these numbers are being used for other services. For example, the emergency number in Paraguay (00) is also used to call the international operator in the United States. A number of countries, such as Italy, use 118 as an emergency number, but it also connects to directory assistance in Finland.

tel:sos This solution avoids name conflicts, but is not a valid "tel" [RFC3966] URI. It also only works if every outbound proxy knows how to route requests to a proxy that can reach emergency services since tel URIs. The SIP URI proposed here only requires a user's home domain to be appropriately configured.

urn:service:sos A related document [I-D.schulzrinne-sipping-service] defines a URN for identifying services, such as emergency calling. This solution fits most cleanly into the overall URI architecture, can support a variety of protocols beyond SIP and avoids dependencies on the home domain, but, like the tel URI solution above, also requires that every outbound proxy can resolve this URN and can route calls accordingly. Alternatively, the end system has to be configured with a suitable URN-resolving proxy, e.g., in its home domain.

SIP URI user parameter: One could create a special URI, such as "aor-domain;user=sos". This avoids the name conflict problem, but requires mechanism-aware user agents that are capable of emitting this special URI. Also, the 'user' parameter is meant to describe the format of the user part of the SIP URI, which this usage does not do. Adding other parameters still leaves unclear what, if any, conventions should be used for the user and domain part of the URL. Neither solution is likely to be backward-compatible with existing clients.

Special domain: A special domain, such as "sip:fire@sos.int" could be used to identify emergency calls. This has similar properties as the "tel:sos" URI, except that it is indeed a valid URI. To make this usable, the special domain would have to be operational and point to an appropriate emergency services proxy. Having a single, if logical, emergency services proxy for the whole world seems to have undesirable scaling and administrative properties.

## 6. Media Feature Tag Registration: Service

Instead of defining additional, more specific, emergency services in the SIP URI, we propose the use of a new media feature tag [RFC3840], sip.service, that describe the desired emergency service.

For example, a user agent could request to be routed to marine rescue by including the following header:

```
Accept-Contact: *;sip.service="sos.marine"
```

[Note: This mechanism fits with the Caller Preferences model, but reduces the backward-compatibility of the overall approach.]

This specification defines an additional media feature tag, extending the SIP tree entries described in [RFC3840] and following the registration process in Section 12.1 of that document. This section serves as the IANA registration for the service feature tags, which are made into the SIP media feature tag tree.

This facility is not meant to encourage end users to select emergency services where a single PSAP for all such services exist. Rather, these identifiers reflect current practice in jurisdictions that already have different numbers for the different emergency services. For example, in Germany, ambulance and fire use 112, while police uses 110.

We expect that users will rarely invoke specific emergency services directly. Rather, they might be generated by outbound proxy servers translating dial strings or be generated when pressing icon-bearing speed dial buttons.

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Using feature tags has the advantage that they are not affected by entities that translate URIs, e.g., to route emergency calls to a specific PSAP.

The service types for this feature tag are case-insensitive. Additional service types can be registered with IANA (Section 7).

Media feature tag name: sip.service

ASN.1 Identifier: New assignment by IANA.

Summary of the media feature indicated by this tag: Each feature tag indicates the type of communication service requested.

Values appropriate for use with this feature tag: Token with an equality relationship. Initial values include a number of emergency services:

sos: general emergency service  
sos.fire: fire brigade  
sos.marine: marine guard  
sos.mountain: mountain rescue  
sos.police: police (law enforcement)  
sos.rescue: ambulance, emergency medical service  
sos.test: testing, not a real emergency call

The feature tag is intended primarily for use in the following applications, protocols, services, or negotiation mechanisms: This feature tag is most useful in a communications application, for describing the capabilities of a user agent providing a particular type of communication service.

Examples of typical use: Allowing an emergency service proxy to select the desired emergency service, such as police or ambulance.

Related standards or documents: RFC3840.

Security Considerations: Security considerations for this media feature tag are discussed in Section 11.1 of RFC3840.

## 7. IANA Considerations

Subaddresses of the "sos" address are registered with IANA. This specification establishes the "sos" subaddress sub-registry under <http://www.iana.org/assignments/sip-parameters>.

Subaddresses are registered by the IANA when they are published in standards track RFCs. The IANA Considerations section of the RFC must include the following information, which appears in the IANA registry along with the RFC number of the publication.

- o Name of the subaddress. The name MAY be of any length, but SHOULD be no more than twenty characters long. The name MUST consist of NVT alphanumeric characters only and is case-insensitive.

- o Descriptive text that describes the emergency service.

## 8. Security Considerations

The SIP specification [RFC3261] details security considerations that apply to emergency calls as well. Security for emergency calls has conflicting goals, namely to make it as easy and reliable as possible to reach emergency services, while discouraging and possibly tracing prank calls. It appears unlikely that classical authentication mechanisms can be required by emergency call centers, but SIP proxy servers may be able to add identifying information.

Given the sensitive nature of many emergency calls, it is highly desirable to use the "sips" URI to ensure transport-level confidentiality and integrity. However, this may cause the call to fail in some environments.

Allowing the user agent to clearly and unambiguously identify emergency calls makes it possible for the user agent to make appropriate policy decisions. For example, a user agent policy may reveal a different amount of information to the callee when making an emergency call. Local laws may affect what information network servers or service providers may be allowed or be required to release to emergency call centers. They may also base their decision on the user-declared destination of the call.

Recognizing only "sos" in the user's home domain, i.e., the domain of the user's AOR, prevents spoofing where a link points to a fake emergency calling number and leads the user to, for example, include location information in the request.

Additional security considerations related to call routing, destination authentication and other issues are detailed in [I-D.ietf-ecrit-requirements] and [I-D.taylor-ecrit-security-threats].

## 9. Acknowledgements

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