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SOS Uniform Resource Identifier (URI) Parameter for Marking of Session  
Initiation Protocol (SIP) Requests related to Emergency Services  
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## Abstract

This document defines a new Session Initiation Protocol (SIP) Uniform Resource Identifier (URI) parameter intended for marking SIP registration requests related to emergency calls and allow admission control to ensure successful initiation of emergency calls. The usage of this new URI parameter complements the usage of the Service Uniform Resource Name (URN) and is not intended to replace it.

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## 1. Introduction

One way to differentiate a SIP-based emergency call from an ordinary call is by the presence of the Service URN as defined in RFC 5031 [RFC5031] (and used in the IETF emergency services architecture described in PhoneBCP[I-D.ietf-ecrit-phonebcpl]). The 3GPP IP Multimedia Subsystem (IMS) emergency services architecture, illustrated in 3GPP TS 23.167 [3GPP.23.167], specifies that the User Equipment (UE) needs to perform emergency registration prior to or during the initiation of an emergency call.

In some countries, it is a regulatory requirement that devices be able to place emergency calls in circumstances where other calls may not be permitted. When a UAC issues an emergency marked REGISTER request it indicates to the registrar that roaming and barring restrictions should not be applied for the registered address-of-record in order to successfully initiate an emergency session. Furthermore, distinguishing emergency registration from non-emergency registration allows the registrar to ensure that the contact address associated with previous registration of the address-of-record included in the emergency REGISTER request is not replaced.

Emergency registration is possible only when the UE has sufficient credentials to register with its home network and can detect that an emergency session is initiated. Unfortunately, marking of the emergency registration cannot be fulfilled by the use of the Service URN. The circumstances where such an emergency registration is beneficial are listed below:

- the UE is not registered with its home network;
- the UE is currently registered but roaming (to ensure that the emergency call is handled in the visited network, as required by some jurisdictions).

This document concentrates on a use case defined by 3GPP as described above. However, the solution proposed does not preclude other systems that require emergency registration to occur prior to placing an emergency call, to ensure that any subscription related restrictions are removed to allow successful initiation of emergency calls.

This document proposes a way to mark a REGISTER request as an emergency registration.

## 2. Terminology

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 RFC 2119 [RFC2119]

## 3. Requirements

Req: Where emergency registration is required prior to placing an emergency call, it shall be possible to distinguish emergency registration from non-emergency registration.

## 4. The "sos" URI Parameter

This section provides an overview of the proposed new URI parameter to be used for marking REGISTER requests related to emergency services.

A new URI parameter "sos" is defined in this document. The "sos" parameter is appended to a URI consistent with RFC 3261 [RFC3261]. It is proposed that use of this URI parameter is restricted to the Contact header included in the REGISTER request (and the 2xx response to the REGISTER request) related to an emergency call only.

Inclusion of the "sos" URI parameter in a REGISTER request SHALL indicate that the REGISTER request pertains to emergency registration. The "sos" URI parameter MUST NOT be considered as a replacement for the Service URN for emergency calls originated by a UA.

### 4.1. REGISTER Request

In networks where the UA sends a REGISTER request for emergency registration prior to placing an emergency call, the "sos" URI parameter MUST be appended to the URI in the Contact header. This serves as an indication to the registrar that the request is for emergency registration thus requesting the registrar to not apply any restrictions to the user's service which might prevent emergency calls from successfully being initiated.

Example:

Contact: "Alice" <sip:alice@example.com;sos> ;q=0.7; expires=3600

In the event that more than one Contact header field is included in the REGISTER request, only the contact addresses that include the

"sos" URI parameter shall be considered as emergency registered contact addresses.

The "sos" URI parameter MUST NOT be included in non-REGISTER requests, and MUST NOT be included in REGISTER requests that do not pertain to emergency calls.

#### 4.2. 2xx Response to REGISTER Request

If the registrar receives a REGISTER request that includes the "sos" URI parameter in the Contact header field, the registrar MUST include the "sos" URI parameter in the Contact header field in the 200 (OK) response sent by the registrar upon successful registration. The "sos" URI parameter is appended to the URI included in the Contact header.

#### 4.3. Backwards compatibility issues

The backwards compatibility scenario considered in this document is where a legacy registrar does not support the "sos" URI parameter. In this case, if the registrar receives a REGISTER request that includes the "sos" URI parameter in the Contact header field, the registrar proceeds with registration procedures and silently ignores the URI-parameter in accordance with RFC 3261[RFC3261]. This ensures the user is registered and thus can successfully initiate an emergency call.

The drawback of proceeding with registration is if the address-of-record is for example barred or has roaming restrictions applied, then these restrictions will not be lifted and thus registration will be unsuccessful. This can limit the UA's ability to successfully place an emergency call.

If registration is successful, the 200 (OK) response from a legacy registrar includes the "sos" URI parameter in the Contact header field. Thus the UA is unaware that the registrar does not support the "sos" URI parameter. Providing the registration was successful, the UA's ability to place an emergency call is not compromised. The UA need not know that the registrar does not support the URI parameter.

The consequence of the registrar not supporting the "sos" URI parameter, in addition to the drawback pertaining to restrictions applied to the address-of-record, are as follows:

- the risk of the registrar overwriting previous registrations of the registered address-of-record, and thus disrupting any on-going non-emergency sessions associated with the UA, its address-of-record and

previously registered contact address.

- incoming calls, such as a PSAP call back (to a previously made emergency call) to the registered address-of-record might not be routed correctly to the UA that placed the emergency call, due to not suppressing any network based services such as call forwarding, or UA based services which can divert the call elsewhere, or if the address-of-record is associated to more than one contact address.

## 5. Formal Syntax

The following syntax specification uses the augmented Backus-Naur Form (BNF) as described in RFC 5234 [RFC5234].

The "sos" URI parameter is a "uri-parameter", as defined by RFC 3261[RFC3261].

uri-parameter =/ sos-param

sos-param = "sos"

## 6. IANA Considerations

This specification defines one new SIP URI parameter, as per the registry created by RFC 3969 [RFC3969]

Parameter Name: sos

Predefined Values: none

Reference: [RFCXXXX]

[NOTE TO IANA: Please replace XXXX with the RFC number of this specification.]

## 7. Security Considerations

As an identifier, the "sos" parameter itself does not raise any particular security issues. The semantics described by the "sos" parameter are meant to be well-known so privacy considerations do not apply to the URI parameter. The main possibility of attack involves use of the "sos" parameter to bypass the normal procedures in order to achieve fraudulent use of services or to bypass security procedures. The usage of this parameter as described in this document is purely for the purpose of the REGISTER request and hence

in presence of user authentication it is ensured that the respective user can be held accountable.

It is RECOMMENDED to log events of misuse of the "sos" URI parameter, for example by including it in a request or response not related to an emergency call.

Emergency registration can result in removing restrictions for roaming and/or barring of services. Misuse of the emergency registered AoR and contact address can be identified within the network and thus requests for unauthorized service will be rejected. Thus, no security considerations related to hijacking of services are foreseen as a result of applying a marking of emergency registrations through the use of a SIP URI parameter.

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