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Digitala trygghetslarm – Internetprotokoll för digitala trygghetslarm (SCAIP) – Implementationsvägledning

Digital social alarm – Social care alarm internet protocol (SCAIP) – Implementation guideline

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Dokumentet ersätter SIS-TR 91102:2014, utgåva 1.

This Technical Report is not a Swedish Standard.

This document replaces SIS-TR 91102:2014, edition 1

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Content

Introduction

This is a technical report for an open IP-based communication protocol that can be used by social care services to support people living in their own homes or in grouped living. Standardization of an open communication protocol is needed to ensure interoperability in the market of social care services.

The SCAIP protocol defined in SS 91100:2014 will allow an open transparent non-proprietary information transfer and communication between users and social services via mainstream communication networks. An official standardized open protocol prevents social care alarms from being blocked or restricted in the European and global telecommunications networks and internet connections.

The protocol is defined to handle initiation, addressing, and transport functions based on SIP (Session Initiation Protocol) in order to set up a media stream and to transfer information between the user and the receiver. The data exchange of the protocol is defined as an XML schema including the alarm types, codes and additional information.

The series of publications for social care alarms include the following:

SS 91100:2014 *Digital social alarm – Social care alarm internet protocol (SCAIP) – Specification*

SIS-TR 91101:2016 *Digital social alarm – Social care alarm internet protocol (SCAIP) – Test specification*

SIS-TR 91102:2016 *Digital social alarm – Social care alarm internet protocol (SCAIP) – Implementation guideline*

1 Scope

This technical report is an implementation guideline for the SCAIP protocol as defined in SS 91100:2014.

The document is intended to be used as a guide to make the standard easy to understand and implement in various situations. The document is to be used by software designers and development personnel.

This document is not the full specification of the SCAIP protocol and does not fully cover all functionality of the SCAIP protocol. The main purpose is to describe the basic functionality of the SCAIP protocol and the relationships to underlying protocols such as SIP.

2 Normative references

This clause specifies the following documents as indispensable for the use of this document. For dated references, only the dated reference applies. For undated references the latest edition of the document applies (including all amendments).

SS 91100:2014 *Digital social alarm – Social care alarm internet protocol (SCAIP) –Specification*

3 Terms and abbreviations

For the use of this document the terms and abbreviations in SS 91100:2014 apply in addition to the following terms and abbreviations.

3.1
operator
person who receives and acts upon an alarm in an alarm receiving centre

3.2
keep-alive
message sent by one device to another to check that the link between the two is operating, or to prevent this link from being broken

Abbreviation	**Definition**
GW	Gateway
SIP UA	SIP User Agent (as defined RFC 3261)

4 Use case examples

4.1 General

Three use cases are described in this section: non-voice, voice and heartbeat. These three cases cover all scenarios used in the SCAIP protocol.

The voice case can then be separated in a number of voice setups described in clause 5, Alarm session and call setup methods.

4.2 Example 1 – Alarm without voice

The response from ARC is sent directly without any errors or HOLD response. Data element *reference* is echoed and data element *status-number* is set to 0.

Table 1 – LUC sends non-voice alarm request to ARC

	LUC action	ARC action

1	LUC sends non-voice alarm request.
	`<mrq>`
	`<ref>1242</ref>`
	`<cid>678</cid>`
	`<dty>27</dty>`
	`<stc>16</stc>`
	`</mrq>`	

2		ARC responds OK.
		`<mrs>`
		`<ref>1242</ref>`
		`<snu>0</snu>`
		`</mrs>`

4.3 Example 2 – Alarm with voice

The response from ARC contains a hold status as indicated by *status-number* data element set to 4. This indicates that ARC cannot respond directly to the alarm request from LUC. E.g. ARC is already processing the alarm request and is not immediately proceeding with further actions. If LUC needs an update on ARC status for this request, the request may be resent.

Responding with hold status is not always the case, i.e. ARC may process the request immediately.

As LUC receives a hold status it resends the alarm request after configured time. As soon as ARC can process the alarm request correctly, it responds with the *status-number* set to 0. If this can't be done, the resending of the alarm request continues for configured time or until ARC responds with a different *status-number* value.

In this example the ARC response with *status-number* set to 0 contains *media-reply* set to 1 which is a voice communication request.

Table 2 – LUC sends voice alarm request to ARC

	LUC action	ARC action

1	LUC sends voice alarm request.
	`<mrq>`
	`<ref>1243</ref>`
	`<cid>678</cid>`
	`<dty>2</dty>`
	`</mrq>`	

2		ARC responds HOLD.
		`<mrs>`
		`<ref>1243</ref>`
		`<snu>4</snu>`
		`</mrs>`

3	LUC waits at least the minimum “HOLD polling time” seconds.	
4	Step 1-3 are repeated until ARC responds with *status-number*=0 (OK) instead of 4 (HOLD).	

5		ARC responds OK with *media-reply*=1.
		`<mrs>`
		`<ref>1243</ref>`
		`<snu>0</snu>`
		`<mre>1</mre>`
		`</mrs>`

6	LUC initiates voice-session to ARC. See the different voice setups in clause 5.	

4.4 Example 3 – Heartbeats

See 7.3 for more information about SCAIP heartbeats in relationship to underlying protocols.

Table 3 – LUC sends a heartbeat to ARC

	LUC action	ARC action

1	LUC sends a heartbeat request.
	`<mrq>`
	`<ref>1244</ref>`
	`<mty>PI</mty>`
	`<cid>678</cid>`
	`<dty>2</dty>`
	`</mrq>`	

2		ARC responds OK.
		`<mrs>`
		`<ref>1244</ref>`
		`<snu>0</snu>`
		`</mrs>`

3	Step 1-2 are repeated after minimum “Heartbeat time” minutes, as defined in Clause 4.5 “Heartbeat” in SS 91100:2014.	

5 Alarm session and call setup methods

5.1 General

For explanation of SCAIP Messages and SIP Messages, see 7.3.

The SCAIP protocol is designed to allow an IP alarm session with the voice supported through other paths and managed by the protocol. The setup of the call looks like:

```
MESSAGE sip:user2@example.com SIP/2.0
Via: SIP/2.0/UDP user1.example.com;branch=z9hG4bK776sgdkse
To: sip:user2@example.com
From: sip:user1@example.com;tag=49583
Call-ID: asd88asd77a@192.0.2.13
CSeq: 1 MESSAGE
Max-Forwards: 70
Content-Type: application/scaip+xml
Content-Length: 144

<mrq>
    <ref>1234</ref>
    <cid>123456</cid>
    <dty>0001</dty>
    <stc>001</stc>
</mrq>
```

5.2 Specifying call setup method

In all call setup examples below, *call-handling*, *transferred-number*, *callhandling-reply* and *caller-id* data elements are used. The URI schemes for defining an address in the *caller-id* and *transferred-number* data elements are:

— “no-voice” for no voice capabilities

— “sip” for voice supported through SIP

— “gsm” for voice supported through GSM.

Example of a *caller-id* for voice supported through SIP: `<crd>sip:user1@example.com</crd>`

The “sip-pp” URI scheme as specified in SS 91100:2014 for *caller-id* data element should not be used. If received it shall be treated as the “sip” URI scheme for backwards compatibility. The “gsm” URI scheme should in a SIP platform be treated as a “tel” URI scheme.

Example: Swedish mobile number: `gsm:+46704308601` is the same as `tel:+46704308601` in the SIP protocol. Note that the mobile number is an example and shall not be used.

5.3 Call setup example 1: Normal outgoing call from the alarm sender

Call setup example 1 shows the basic method to make the alarm using SIP for both message and voice with the same SIP URI.

If *caller-id* is used then only valid URI schemes can be used. If *caller-id* is omitted, the SIP URI from the SIP Message is used as *caller-id* of LUC.

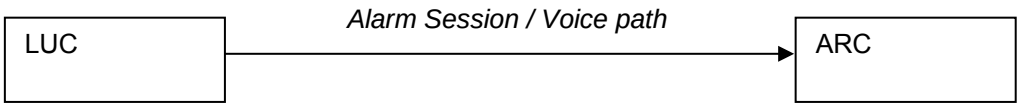

Figure 1 – Basic method for using SIP for both message and voice with the same SIP URI

Example without mandatory XML elements:

Request:

```
<cha>0</cha>(or omitted)
<crd>sip:user1@example.com</crd>
```

Response:

```
<cre>61</cre>(or omitted)
```

5.4 Call setup example 2: Callback request using SIP

In call setup example 2, callback is requested using SIP for both message and voice with the same SIP URI. If *"caller-id"* is used then only valid URI schemes can be used. If *caller-id* is omitted the SIP URI from the SIP Message is used as *caller-id* of LUC.

A callback function is used and requested from LUC. In the example, LUC will be open for a callback from ARC for 5 minutes.

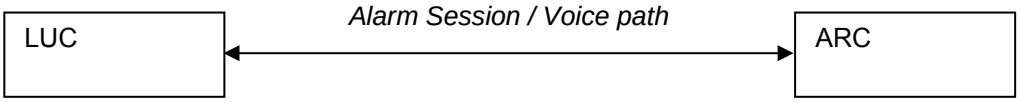

Figure 2 – Callback using SIP for both message and voice with the same SIP URI

Example without mandatory XML elements:

Request:

```
<cha>1</cha>
<crd>sip:user1@example.com</crd>
```

Response:

```
<cre>05</cre>
```

If *caller-id* is omitted, the SIP URI from the SIP Message is used as *caller-id* of LUC.

Request:

```
<cha>1</cha>
```

Response:

```
<cre>05</cre>
```

5.5 Call setup example 3: LUC GSM dial-in to ARC with predefined number

In this example LUC is transmitting the alarm through SCAIP on IP according to the protocol definition. The voice is transmitted separately on another path, typically GSM. The example describes a call from LUC to ARC over separate media. LUC lists all possible media that can be used as voice channel. In this case LUC chooses which media to use, SIP or GSM, as ARC doesn't list any media for communication.

In this case there are two ways to set up the call, over GSM or over SIP, as listed by the two *caller-id* data elements.

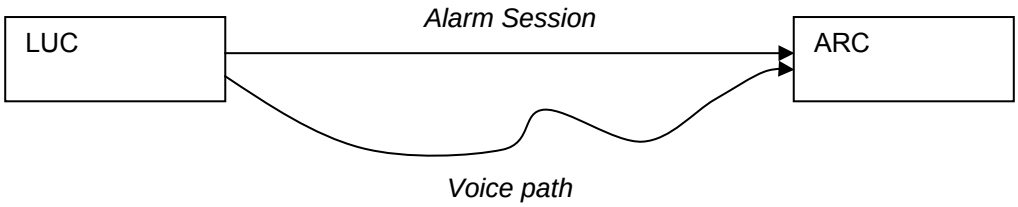

Figure 3 – Call setup when using a separate voice path

Example without mandatory XML elements:

Request:

```
<cha>0</cha>
<crd>sip:user1@example.com</crd>
<crd>gsm:+46704308601</crd>
```

Note that the *call-handling* data element can be omitted.

Response:

```
<cre>61</cre>
```

Note that the *callhandling-reply* data element can be omitted, in which case it defaults to 61.

If LUC has GSM capability, but is not configured with the local mobile number, it should use an empty field to indicate this as showed in the request below. In this case ARC needs to be configured with LUC phone number.

Request:

```
<cha>0</cha>
<crd>gsm:</crd>
<crd>sip:user1@example.com</crd>
```

Please note that the *call-handling* data element can be omitted.

Response:

```
<cre>61</cre>
```

Note that the *callhandling-reply* data element can be omitted, in which case it is interpreted as 61 according to SCAIP.

To force LUC to use a specific call setup method, ARC can request an URI scheme in *transferred-number* data element. No number is needed as it is a call to a predefined number. If a number is added, *callhandling-reply* should be set to 62.

Request:

```
<cha>0</cha>
<crd>sip:user1@example.com</crd>
<crd>gsm:+46704308601</crd>
```

Response:

```
<cre>61</cre>
<tnu>gsm:</tnu>
```

ARC may only select one of the URI schemes from the *caller-id* data elements in the request.