SVENSK STANDARD
SS 91100:2014

Fastställd/Approved: 2014-04-28
Publicerad/Published: 2014-05-05
Utgåva/Edition: 1
Språk/Language: engelska/English
ICS: 11.180.01; 13.320; 35.020; 35.080; 35.240.80

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

Digital social alarm – Social care alarm internet protocol (SCAIP) – Specification

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Standarden är framtagen av kommittén för Trygghetskedjan för trygghetslarm, SIS/TK 574.

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Content

Introduction

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

The protocol defined in this standard will allow an open transparent non-proprietary information transfer and communication between users and social services via mainstream communication networks. An official standardised 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.

In this standard two generic use cases are described: one without establishment of a voice or multimedia session, and one use case describing an event message exchange combined with an additional voice or multimedia session using SIP.

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 91101:2014	*Digital social alarm – Social care alarm internet protocol (SCAIP) – Test specification*
SIS-TR 91102:2014	*Digital social alarm – Social care alarm internet protocol (SCAIP) – Implementation guideline*

1 Scope

This standard specifies the Social Care Alarm Internet Protocol, SCAIP. This standard describes how the protocol handles a multimedia communication stream and how to send event messages between the alarm sender and the alarm receiver over an IP communication network such as Internet.

The data exchange of the protocol is defined as an XML schema including the alarm types, codes and additional information required to fulfil the requested functionality. The protocol uses a widely used and standardized application layer protocol, SIP (Session Initiation Protocol), for creating, modifying and terminating the session.

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).

RFC 2617, *HTTP Authentication: Basic and Digest Access Authentication*

RFC 3261, *SIP: Session Initiation Protocol*

RFC 3264, *An Offer/Answer model with Session Description Protocol (SDP)*

RFC 3428, *SIP Extension for Instant Messaging*

RFC 3550, *RTP: A Transport Protocol for Real-time Applications*

RFC 4733, *RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals*

3 Terms and Abbreviations

For the use of this document the following terms and abbreviations apply.

3.1
alarm receiver
alarm receiving centre
system part which provides facilities for communication with a number of controllers, and providing the alarm receiving and information processing system as an interface to the alarm recipient

3.2
codec
device capable of encoding and decoding a digital data stream or signal

3.3
controller
alarm sender
interface between one or more Local Units and the alarm transmission system or alarm recipient

3.4
heartbeat
periodic event generated by hardware or software to indicate normal operation or to synchronise parts of a system

3.5
in-band signalling
sending of control information within the same band or channel used for voice

3.6
interconnections
transmission system that provides the communication between trigger devices and local unit and controller

3.7
Local Unit
interface between the user and the controller which enables two-way speech

3.8
multimedia
media and content that use a combination of different content forms as text, audio, still images, animation, video or interactivity

3.9
polling
sampling of a device to synchronise an activity

3.10
protocol
system of digital rules for message exchange within or between computers

3.11
social alarm system
telecare system
system providing 24 h facilities for alarm triggering, identification, signal transmission, alarm reception, two-way speech communication, reassurance and assistance, for use by persons considered to be at risk

Abbreviation	Definition
ARC	Alarm Receiving Centre
ASCII	American Standard Code for Information Interchange
GGA	Global Positioning System Fix Data
GPS	Global Positioning System
GSM	Global System for Mobile Communications
IP	Internet Protocol
ISO	International Organization for Standardization
LUC	Local Unit and Controller
NMEA	National Marine Electronics Association
POTS	Plain Old Telephone Service
RFC	Request for Comments
RTP	Real-time Transport Protocol
SRTP	Secure Real-time Transport Protocol
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SIP-PP	Session Initiation Protocol, Peer-to-peer
TLS	Transport Layer Security
UCS	Universal Character Set

Abbreviation	Definition
UDP	User Datagram Protocol
UTF	UCS Transformation Formats
XML	eXtensible Markup Language
URI	Uniform Resource Identifier

4 Use Case 1: Event without voice- or multimedia communication

4.1 General

Figure 1 shows a communication model with an alarm sender communicating over the network, e.g. Internet, with SCAIP as protocol and an alarm receiver as endpoint. Messages are initiated from either an end user, e.g. human, or a device and could have the function either as an alarm or a status message.

Figure 1 — Communication setup

Figure 2 shows a message exchange between the alarm sender and the alarm receiver.

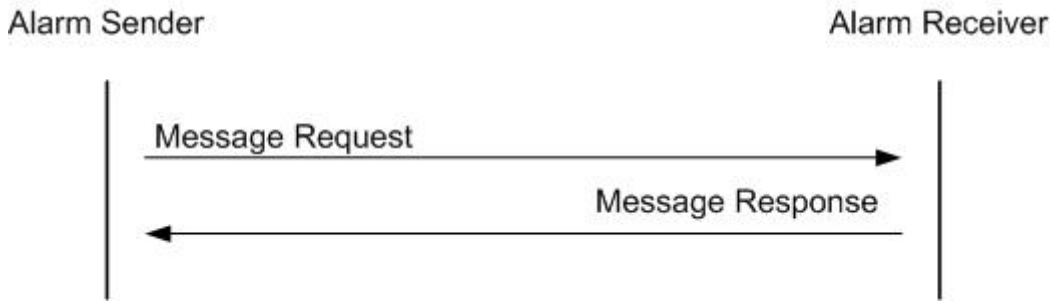

Figure 2 — Message exchange

In this use case, the alarm sender sends a Message Request to the alarm receiver. Each Message Request shall be acknowledged by the alarm receiver using a Message Response.

An event shall be considered successfully handled when the status number (status-number, see table 2) of the Message Response is set to 0.

4.2 Event not treated by alarm receiver

If the alarm receiver cannot determine the event as treated it shall return a Message Response with status message (status-number, see table 2) set to 4. This shall cause the alarm sender to resend the same Message Request after 5 to 20 seconds.

This polling sequence shall continue for at least 3 minutes but shall not continue for more than 30 minutes.

4.3 Event information update

If the alarm sender has new information related to an event that is being processed the alarm sender shall send a Message Request with message type (message-type, see Table 1) set to Information update and all mandatory data elements set to the same value as the initial Message Request.

4.4 Aborting message session

The alarm sender shall stop resending the Message Request and continue with an alternative action if the alarm sender has not received a Message Response with status number (status-number, see table 2) set to 0 within a specified time. In such case it shall abort the alarm by sending a Message Request with message type (message-type, see table 1) set to Reset and reference (reference, see table 1) set to the same value as in the initial Message Request.

4.5 Heartbeat

The alarm sender shall poll the alarm receiver periodically with a Message Request having message type (message-type, see table 1) set to Heartbeat. The alarm receiver shall return a Message Response with status number (status-number, see table 2) set to 0.

The heartbeat period should be minimum 1 minute and maximum 1440 minutes.

5 Use case 2: Event with voice or multimedia communication

In this use case the alarm sender will send a Message Request as well as establish a voice or multimedia session. The message exchange shall be handled the same way as in use case 1, shown in figure 1, with the exception that the voice or multimedia sessions should only be initiated by the alarm sender after it has received a Message Response with status number (status-number, see table 2) set to 0 and media reply (media-reply, see table 2) set to 1 or more. Upon reception of the Message Response, the alarm sender should initiate the voice session within 60 seconds.

NOTE The alarm receiver of the Message Request may or may not be the same as the alarm receiver of the voice or multimedia communication. The alarm sender may be able to connect to multiple alarm receivers for different events.

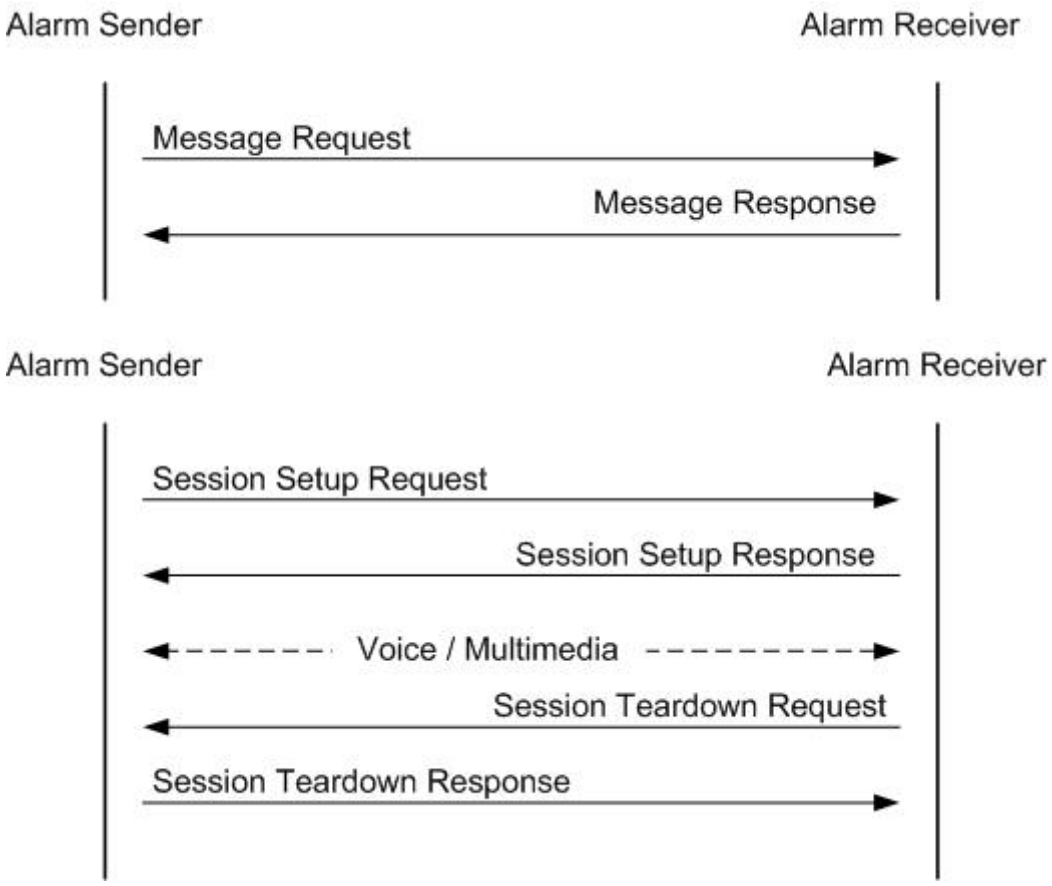

Figure 3 — Message exchange with voice or multimedia communication

Figure 3 shows a message exchange combined with the establishment of a voice or multimedia communication.

The voice or multimedia communication shall be initiated by the alarm sender. Once the communication is established it may be modified or terminated by either the alarm sender or the alarm receiver.

Some functions should be controlled by single DTMF codes from the alarm receiver to enable a basic control facility from a handset with a traditional telephony keyboard.

6 Message format description

6.1 General

SCAIP uses an XML format for the messages to represent the alarms and information codes. The messages shall conform to a specific XML schema that should be used to verify the messages. The XML schema is defined in Annex F.

Table 1 and Table 2 provides information about the data elements. The column “Length in characters” provides the minimum and maximum number of characters of the text in a present data element. An asterisk (*) indicates that the data element is mandatory. If a non-mandatory data element is excluded the receiver of the Message Request or Message Response should treat it as defined for “omitted”.

EXAMPLE 1 0/2-4 without an asterisk (*) means that the data element may be omitted. When it is omitted it shall have a length of 0 characters when it is present the length shall be 2, 3 or 4 characters.

EXAMPLE 2 1-16 * means that data element is mandatory and shall have a length of 1 to 16 characters.

Content values enclosed between apostrophes are to be interpreted as the text string between them and shall be coded in US-ASCII format if not otherwise stated.

EXAMPLE 3 “1” means the US-ASCII value of the character 1.

6.2 Message Request

Message Requests shall be encoded as a list of child XML tags and data elements contained in the root tag message-request according to the template below. The template defines the XML encoding of all possible data elements. The data elements are specified in table 1.

```
<mrq>
     <ref>reference</ref>
     <ver>version</ver>
     <sco>system-config</sco>
     <cha>call-handling</cha>
     <mty>message-type</mty>
     <hbo>heartbeat-options</hbo>
     <cid>controller-id</cid>
     <dty>device-type</dty>
     <did>device-id</did>
     <dco>device-component</dco>
     <dte>device-text</dte>
     <crd>caller-id</crd>
     <stc>status-code</stc>
     <stt>status-text</stt>
     <pri>priority</pri>
     <lco>location-code</lco>
     <lva>location-value</lva>
     <lge>
          <geo>wgs-pos</geo>
          <tim>time-stamp</tim>
          <gga>gga-pos</gga>
     </lge>
     <lte>location-text</lte>
     <ico>info-code</ico>
     <ite>info-text</ite>
     <ame>additional-message</ame>
</mrq>
```

Table 1 – XML description for Message Requests

Data element name	XML tag	Description of content	Length in characters
message-request	<mrq>	Compound element for the Message Request	
reference	<ref>	The reference is used to match the Message Response against the Message Request. The reference number shall differ between subsequent Message Sessions. The valid characters are: “A” through “Z”, “a” through “z” and “0” through “9”.	1-16 *
version	<ver>	Protocol version written as two digits, a period and two digits. EXAMPLE “01.23” When omitted, “01.00” shall be assumed. The valid characters are “0” through “9”	0/5
system-config	<sco>	System configuration and information Omitted or “0” = Local unit and controller “1” = Grouped equipment with supervisor off duty “2” = Grouped equipment with supervisor on duty “3” = Grouped equipment with supervisor on duty acting as an alarm receiver	0/1