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SDP Extensions for Fax over IP Using T.38

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Abstract

Fax over IP is currently using SMTP, i.e. the fax is sent as an e-mail. It would be desireable to support a fax delivery that can return status of the transmission in real time, such as whether the phone number or address was correct, whether the remote side was busy, etc. The ITU is standardizing a protocol for transferring real time fax over IP, T.38. This standard is meant to be used with the H.323 standard, but it is also possible to use it together with SIP, provided that SDP is extended to support the necessary parameters. This document defines extensions to SDP to support the use of T.38 for real-time fax.

1 Introduction

Fax is a popular means for transferring documents between locations. Traditionally, this has been done over the telephone network, as defined in the ITU specification T.30 [1]. Some of the reasons for the populatity of fax is that the sender of a fax gets a notification that the fax has been successfully sent, and that the receiver gets information on the senders telephone number and the time the fax was received. Another reason is that fax transmission over a telephone connection can not easily be eavesdropped. When introducing fax over IP, these benefits should be preserved. The ITU standard T.38 [2] defines how to transport the fax signals over IP. It is expected that the fax channel is set up by some other means, e.g., through H.323 or SIP. Annex D of H.323 [3] describes how H.323 supports fax over IP. In this document we will describe how SIP and SDP can do the same. It would probably be possible to even support the T.38 scope with SIP and SDP, but that is for future work.

2 Introduction to T.38

The ITU T.38 recommendation defines how to transfer fax in realtime between fax gateways and/or IP fax machines in an IP network. Transport of the fax signals is done either by TCP or UDP, and reliability with UDP is achieved through error control mechanisms in T.38, which can be either parity FEC or packet redundancy. The recommendation assumes that a network connection has already been established by the two (or more) peers. This is similar to traditional fax, where a phone line is allocated before the actual fax signalling starts. The issues that are left to be handled by other mechanisms are addressing, identification, authentication, and creation of the fax connection. The fax machines must also have agreed on whether to use UDP or TCP for transport, and in case of UDP, the error control scheme to use.

3 Session Initiation Protocol

The Session Initiation Protocol (SIP) [4] already provides mechanisms for user (fax machine) location, caller identification, call establishment, and authentication. No additions are needed to support the use of T.38.

4 Extensions to SDP

The Session Description Protocol (SDP) (RFC 2327 [5]) provides mechanisms for describing sessions. The information that needs to be represented in SDP for T.38 is

- the fact that T.38 is to be used,
- whether to use TCP or UDP for transport, and
- which type of error control to be used by T.38.

Thus, the SDP message could be the following:

```
v=0
o=faxgw1 2890844526 2890842807 IN IP4 128.59.19.68
s=FAX message
e=faxsupport@company.com
t=2873397496 0
c=IN IP4 128.59.19.68
m=application 49170 udp t38
a=t38errctl:parFEC
```

In order to do this, “application/t38” needs to be registered as a MIME type according to the recommendations in [5]. The choice of TCP or UDP can already be represented in SDP, and the error control scheme should be represented as an attribute.

5 Security Considerations

SIP provides security mechanisms for authentication of caller, and encryption of SIP messages including the SDP payload. For the T.38 flow, IP security mechanisms, as defined in RFC 1825 [6], can be used.

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