APPLICATION NOTE - 9

Feature: T.38 Fax over IP

Fax: Introduction

Fax (derived from Facsimile) is used to send documents over distances using fax machines in secure manner. It replicates entire document in image format and sends them over traditional analog lines or Internet, to be received by user in hardcopy or paper form. Since fax is simply an image transfer over analog lines or Internet, It enables secured and business-critical communications as compared to open and unsecured email transfer. Fax over IP uses same method of compression and interpretation as image data as traditional (G3) fax but uses T.38 protocol for transmission of fax data over Internet.

Fax over IP (FoIP)

Realizing benefits of cost-effectiveness and converged voice and data services, enterprises have become favourable to adapt IP telephony. Enterprises also expect the simplicity and reliability of analog fax to be integrated in their IP network. Sending fax over internet eliminates need of dedicated analog lines to send fax over large distances. Using FoIP technique, fax resources can be shared enterprise-wide and made available to all IP users.
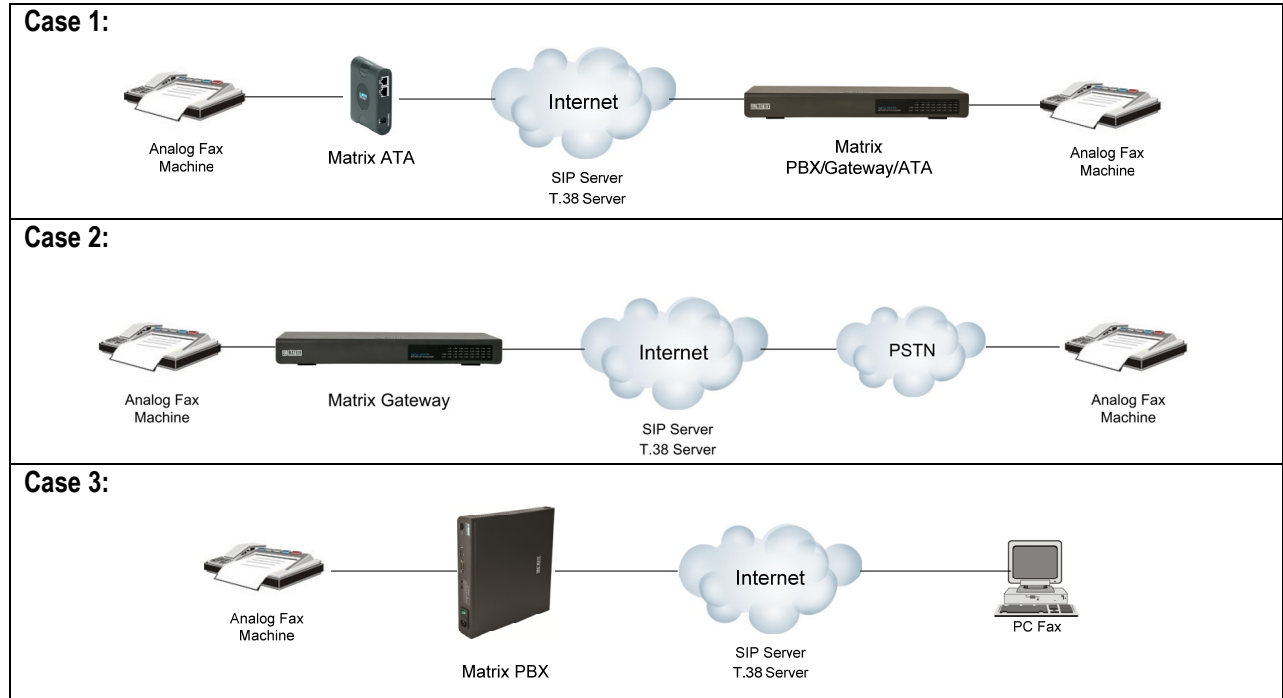
FoIP Protocols:

Primarily there are two ways that fax transactions are conveyed across packet (IP) networks, T.37 and T.38. The T.37 is an old non-real time fax standard (majorly taken over by T.38).

In contrast, T.38 defines an international protocol that transmits fax in real-time over IP network, just as original G3 fax standards did for the traditional TDM network. Being real-time, it enables enterprises to send faxes for business-critical applications. T.38 can start sending a page as soon as it gets some data, without performing any buffering as in case of T.37.

To maintain the quality and to minimize the network errors of missing or delayed packets, T.38 employs special spoofing and fax-aware buffer-management techniques. Each packet in T.38 fax contains a copy of the main data in the previous packet. It practically requires loss of two successive packets for significant degradation in quality to take effect. This forward error correction makes T.38 more tolerable to dropped packets than using Fax Pass through.

Send or Receive regular Analog FAX transmitted over IP:

The T.38 calls originating from fax machine on either side gets terminated on T.38 compatible PBX/Gateway/ATA located on the other side of IP network, to be received by fax machine connected to these devices. In the whole process the call management is done by SIP.

Case 1:

Analog Fax Machine — Matrix ATA — Internet (SIP Server T.38 Server) — Matrix PBX/Gateway/ATA — Analog Fax Machine

Case 2:

Analog Fax Machine — Matrix Gateway — Internet (SIP Server T.38 Server) — PSTN — Analog Fax Machine

Case 3:

Analog Fax Machine — Matrix PBX — Internet (SIP Server T.38 Server) — PC Fax

As shown in diagrams, Analog fax machines connected on either side uses ITU T.30 fax-to-fax protocol to communicate with each other. Here, T.38 supported Matrix PBXs, Gateways or ATAs can be placed anywhere in between IP and PSTN for interoperability between these networks. These products support TDM voice on the PSTN side and VoIP and FoIP on the IP side.

Advantages with T.38 compliant Matrix Products:

- Eliminates need of dedicated fax line, as required in case of Analog fax
- Reduce long distance fax charges, use of cost-effective IP network
- Preserve confidentiality: secured fax transmission over internet
- Simultaneous sending of multiple faxes
- Fax resources can be shared with remote users

T.38 support in Matrix Products:

Majority of the Matrix products support all variants of T.38 like UDPTL and RTP to ensure secured and real-time fax transmission for business-critical applications with use of any of the two protocols. Support of Fax pass through is also provided in following products to ensure communication to happen in all other circumstances.

List of T.38 compliant Matrix products:

PBXs

> ETERNITY PE
> ETERNITY GE
> ETERNITY ME
> SAPEX SDM
> SAPEX DDM

Gateways

> SETU VFX
> SETU VGFX
> SETU VFXTH

ATAs

> SETU ATA1S
> SETU ATA2S
> SETU ATA211
> SETU ATA211G

Release	23-July-2010