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AEMcom

Automatic recognition of fax transmission over IP Network

Abstract

In VoIP scenario the fax is connected to network by a gateway.
The idea is that gateway MUST inform the fax machines on the network type used to delivery data.
In this way fax can auto set baud rate and ECM to delivery documents over IP network and increase the success rate of transmissions.

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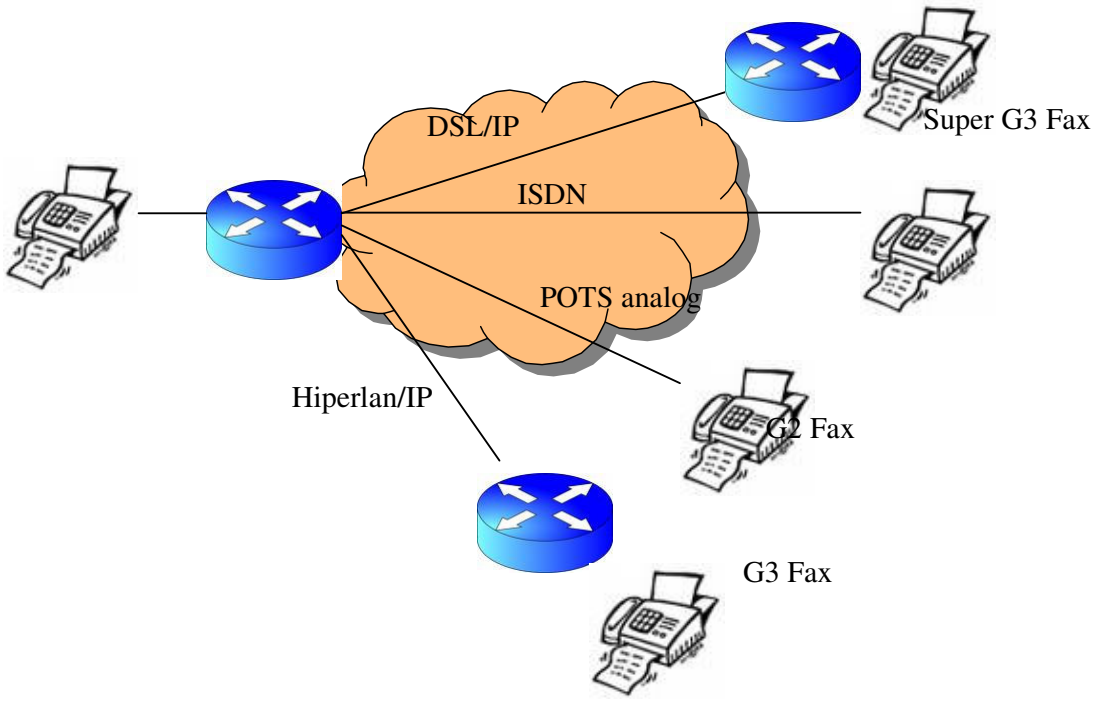
Introduction

Newest fax machine supports very usefull functions that improve their performance on POTS/PSTN lines such as high speed modem and error correction.
These features, all we know, are a problem in IP network where packet loss, jitter and latency can corrupt fax transmissions.
So, the first step to use facsimile over IP is to lower the data rate and disable error correction mode.
This practice is suggested from a large number of VoIP Service Provider all over the world.

But if a generic user must send fax over different lines and pretends maximum performance of his device he will change fax parameters every time.



This method is not very usefull and require manual intervention.

Proposal

In VoIP scenario the fax is connected to network by a gateway. When the gateway detects CED or CNG tone it takes an action based on its configuration and its features:

- use T.38;
- use up speeding fax pass through;
- use proprietary delivery modem fax implementation;
- disable echo suppression;
- disable VAD;
- fixed de-jitter buffer;
- etc.

So, we know that gateway recognizes fax communication.
We know, also, that fax uses several different modulation techniques negotiated during the fax-modem handshake, and it will adopt the highest data rate that both fax devices support.
In IP network this choice is not the best choice.

The idea is that gateway MUST inform the fax machines on the network type used to delivery data.

In this way fax can auto set baud rate and ECM to delivery fax over IP network.

Implementation

ITU-T Rec. T.30 (09/2005) describes procedures for document facsimile transmission in 5 phases:
1) Phase A – Call establishment;
2) Phase B – Pre-message procedure;
3) Phase C1 – In-message procedure and Phase C2 – Message transmission;
4) Phase D – Post-message procedure;
5) Phase E – Call release;

Whit the introduction of a new phase called ARIP (Automatic Recognition of IP Network) after phase A and before phase B, the gateway can send information to fax before message transmission.

See the graph:

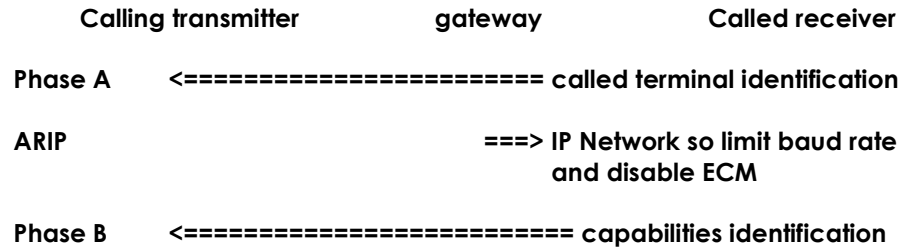


Fig.A

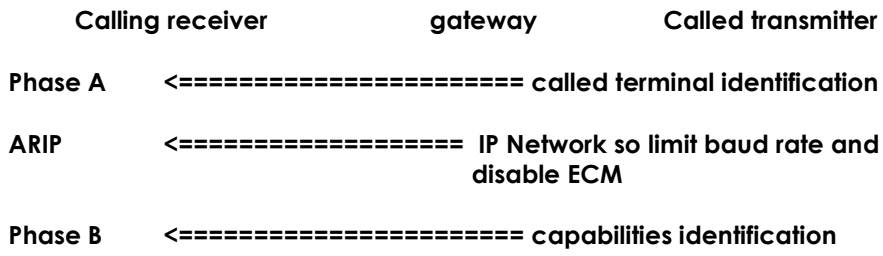


Fig.B

In both cases of receiving or transmitting the gateway MUST send the ARIP information tone to fax device or out to its telephone interface.

The gateway starts ARIP 1 second after phase A with a tone of 2900Hz ±15Hz for a duration of not less than 1 second and not more than 2 second.

No acknowledge procedure is necessary.

If facsimile recognizes ARIP tone will set its maximum baud rate to 9600 bps and will disable ECM otherwise no operation will be performed.

The transmission can proceed to next phase in according to ITU-T T.30 recommendation.

References and Terminology

T.30 International Telecommunication Union - Procedures for document facsimile transmission in the general switched telephone network, Recommendation T.30, Telecommunication Standardization Sector of ITU 09/2005

The term "gateway " used in this document describes a device that interconnect a generic IP network to a POTS/PSTN network or device.

Author's Address

Daniele Giordano
Email: d.giordano@fastpiu.it

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