

Configuring and Troubleshooting the Cisco ATA 186 with Fax

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Introduction

Cisco Analog Telephone Adaptor (ATA) 186 supports fax transmission only as passthrough. It cannot support fax-relay. Both ports of the ATA support fax calls. For fax calls to work correctly, both the Cisco ATA 186 and the supporting gateway must be configured correctly. On Cisco gateways fax-relay is on by default. For the fax calls to work between the ATA and the gateway, the fax-relay on the gateway must be disabled.

The Cisco ATA 186 sends fax by one of two methods:

- Fax detection method or,
- Receive (Rx) and transmit (Tx) codec

In fax detection mode, you can use LBRC in order to configure the Cisco ATA 186. The Rx and Tx codec modes negotiate any codec for voice calls until it detects a fax-tone. Once it detects the fax-tone it does this:

- Turns off fax tone detection.
- Turns off silence suppression.
- Re-negotiates the codec to G.711 u-law or G.711 A-law.

Note: The fax-tone can be detected only for calls terminated by the ATA. For calls originated by the ATA, the fax detection and renegotiation of the codec has to be initiated by the supporting gateway. In G.711 fax mode, the Cisco ATA 186 passes the Real Time Protocol (RTP) packets sent between the end fax machines without intervention. The ATA 186 treats the fax session like any normal voice call.

Note: Fax transmission rates are supported up to 9600 bps. Refer to Fax Passthrough Limitations on ATA 186 for more information on fax transmission rates. ATA 186 I1/I2 can support fax rates up to 14.4 kbps.

Note: ATA 186 is not supported for analog modem calls. The modem referred to throughout the documentation implies fax modem.

Note: Fax pass-through for ATAs attached to Cisco CallManager Express (CME) is presently supported only with the H.323 protocol.

Prerequisites

Requirements

Ensure that you meet these requirements before you attempt this configuration.

- Cisco ATA 186 version 2.0 or later, using H.323
- Cisco ATA 186 needs IP connectivity and must be accessible through the web server for configuration
- Basic configuration, refer to ATA Basic Configuration

Components Used

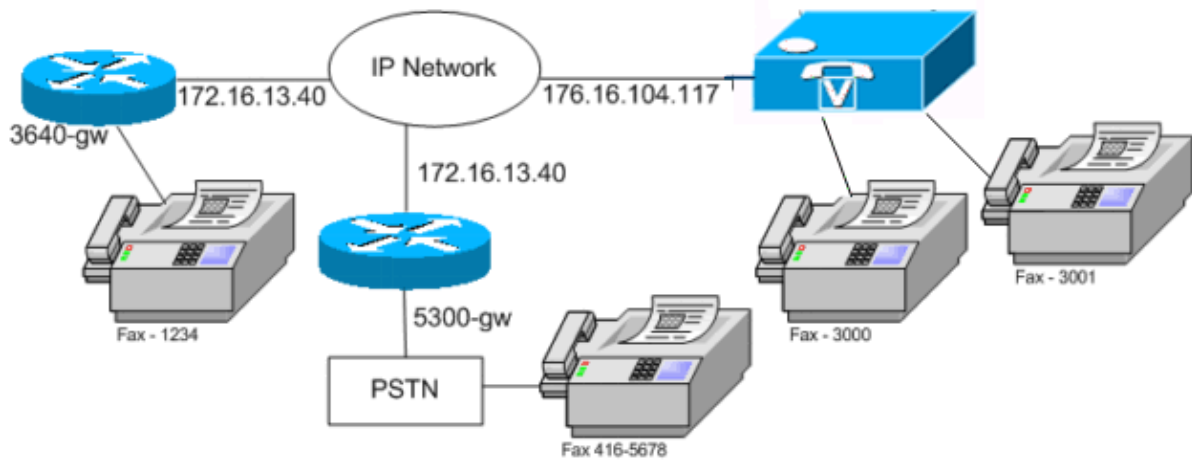
The information in this document is based on these software and hardware versions.

- Cisco ATA 186 I1/I2 version 2.12
- Cisco 3640 Gateway with Cisco IOS® Software Release 12.1, as a gateway in the Fax Mode configuration example
- Cisco 5300 Gateway with Cisco IOS Software Release 12.1, as a gateway in the Fax Detection method configuration example

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Network Diagram

This document uses this network setup.



Conventions

Refer to the Cisco Technical Tips Conventions for more information on document conventions.

Configure Fax Detection Method

Configure Fax Detection Method on the Cisco ATA 186

Use a web browser and go to http://<ip_address_of_ata>/dev (for example, <http://172.16.104.117/dev>) in order to configure the Cisco ATA 186 using the web interface.

You must configure these parameters in order to configure the Cisco ATA 186.

- Audio Mode

```
bit 2 (18)=0 Enable detection of FAX CED (answer) tone and switch to FAX mode
for the rest of the call if the tone is detected
```

- Connect Mode

```
bit 7=0/1 to disable/enable fax redundancy
```

```
!--- This must be set based on the
!--- configuration of the gateway.
```

```
0=disable fax redundancy; 1=enable fax redundancy
bit 8-12=the offset to NSE payload type number 96.
The legal values are between 0 to 23 correspond
to dynamic payload types 96 to 119. When using
the ATA 186 for fax with the Cisco Gateway leave
this value at default value which is 4
bit 13=0/1 to negotiate G711 u/a law as the new
codec to be negotiated
```

```
!--- This must be set based on the
!--- configuration of the gateway.
```

```
0=G711ulaw; 1=G711alaw
bit 14=0 Enable Modem Pass Through
bit 15=0 Enable Modem Pass Through Detection
```

- CallFeatures and PaidFeatures

bit 15 (31)=1 Fax Permitted

- Set the Rx/Tx and LBRC codec values, and enable/disable the Voice Activity Detection (VAD) [bit 0(16) = 1/0 in Audio Mode], as required for voice calls.

G.723.1-codec ID 0; G.711a-codec ID 1; G.711u-codec ID 2; G.729a-codec ID 3
 LBRC is 0-G.723.1 codec is available to both FXS ports at any time
 LBRC is 3-G.729a is available to one of the two FXS ports on a
 first-come-first-served basis

Configure Fax Detection Method on the Cisco IOS Gateway

In order to configure the fax detection method on the Cisco IOS gateway, it must support modem passthrough, as this example shows.

```
dial-peer voice tag voip

modem passthrough { NSE [payload-type number] codec {g711ulaw | g711alaw}
  [redundancy] | system}

fax rate disable
```

Example of Fax Detection

This is an ATA configuration example for fax detection method using G.729 codec for voice calls and G.711u-law for fax calls.

- **Audio Mode** xXXX5XXX5
- **Connect Mode** xXXXX04XX
- **Rx Codec**f
- **Tx Codec**f
- **LBRCCodec**f

Configure the Cisco 5300 Gateway

This is the **show running-config** command output for the Cisco 5300 Gateway.

```
5300-gw#show running-config
Building configuration...
.
.
.
!
voice service voip
modem passthrough nse codec g711ulaw
!
.
.
dial-peer voice 1 pots
destination-pattern 2T
port 1:0
!
dial-peer voice 3 voip
incoming called-number 2T
destination-pattern 300.
session target ipv4:172.16.85.233
modem passthrough nse codec g711ulaw
fax rate disable.
```

Configure Fax Mode Method

Configure Fax Mode Method on the Cisco ATA 186

Use a web browser and go to `http://<ip_address_of_ata>/dev` (for example, `http://172.16.104.117/dev`) in order to configure the Cisco ATA 186 using the web interface.

You must configure these parameters in order to configure Cisco ATA 186.

- Audio Mode

```
bit 0 (16)=0 Disable VAD
```

```
bit 1 (17)=1 Use G711 Codec Only
```

- Rx/Tx Codec 1/2 for a/u law respectively
- Connect Mode

```
bit 14=0 Enable modem passthrough
```

```
bit 15=1 Disable modem passthrough detection
```

- CallFeatures and PaidFeatures

```
bit 15 (31)=1 Fax Permitted
```

Note: The Cisco IOS Voice Applications Software Gateway must be configured with the same codec and VAD as the ATA is configured. In this scenario, all calls, fax, or voice use G.711 with no VAD. Refer to Understanding Dial Peers and Call Legs on Cisco IOS Platforms and Configuring Dial Plans, Dial Peers, and Digit Manipulation in order to configure dial-peers on the gateway. All Cisco IOS gateways can be used in the fax mode method. This example shows that a Cisco 3640 Gateway is used.

Example of Fax Mode Method

This is the sample configuration for the Cisco ATA 186 and the gateway when using the fax mode method with G.711u-law for both fax and voice calls.

- **Audio Mode** xXXX2XXX2 where X is not considered for this configuration
- **Connect Mode** xXXXX8XXX where X is not considered for this configuration
- **Rx Codec;**
- **Tx Codec;**
- **LBRCCodec;**

Configure the Cisco 3640 Gateway

This is the **show running-config** command output for the Cisco 3640 Gateway.

```
3640-gw#show running-config
Building configuration...
.
.
.
dial-peer voice 11 voip
  incoming called-number 5000
  destination-pattern 3000
  session target ipv4:172.16.85.233
  codec g711ulaw
  no vad
!
```

```
dial-peer voice 5000 pots
 destination-pattern 5000
 port 3/1/0
.
.
```

Verify

There is currently no verification procedure available for this configuration.

Troubleshoot

This section provides information you can use to troubleshoot your configuration.

Troubleshoot on the Gateway

Use the **debug voip ccapi inout** command in order to debug end-to-end Voice over IP (VoIP) calls. Use the **debug vtsp dsp** command in order to show the digits as they are received by the voice port.

Troubleshoot on the Cisco ATA 186

When you work with Third-party gatekeepers and gateways, the troubleshooting tool on the Cisco ATA 186 can be helpful. Complete these steps in order to enable the Cisco ATA 186 troubleshooting tool.

1. Configure the IP address of the PC which is on the same subnet as the Cisco ATA 186 in the ATA Nprintf field.
2. The port specified after the address must be **9001**.
3. Execute the **preserv.exe** program at the DOS prompt on the PC.

Download the preserv.exe program from the Cisco Downloads (registered customers only) . From the Downloads page, click the **Voice Software** link in order to access the Cisco ATA 186 Analog Telephone Adaptor link.

Note: The preserv.exe program is included in the latest Cisco ATA 186 software release zip file.

The ATA is designed as an endpoint and therefore does not have direct inward dial (DID) functionality. In order to pass the DID information as dual tone multifrequency (DTMF) to the fax server in the given network scenario, you need to use an H.323 IOS gateway instead of an ATA.

If you get a `poor line condition error` or a busy signal when you send faxes out through ATA, try to disable ECM (Error Correction Mode) on the fax machine and attempt the fax after that. The ECM setting is configurable in most fax machines. With it turned on, the fax machine is extremely sensitive to the transmission and reception.

Fax Machines Connected to a Cisco ATA Cannot Send Faxes, or Fax Calls Fail Intermittently

Fax operation fails when you use Super G3 Fax with ATA 186. G3 is a standard out of the T.30 and actually can use V.34. It is recognized by voice gateways as a modem call (2100Hz with phase reversals). Super G3 fax machines support speeds of 33.6 Kbps (modem speed), and most of these fax machines use their dual modems to transmit and receive faxes. The Cisco ATA was designed to support analog phones and G3 fax transmissions (14400 bps maximum). The Cisco ATAs were not designed to support modems, either. In short, Super G3 Faxes are not supported with Cisco ATA because they use 33.6 kbps to establish the call. The

recommendation for faxes is FXS ports, either on a router or a VGXXX.

As a workaround, you can try to modify these parameters:

- Change the fax speed to 9600 bps (the recommended speed for no issues).
- Set the protocol to G3.
- Disable the Error Correcting Mode (ECM).
- If the above actions do not work, plug the fax machine into the Foreign Exchange Station (FXS) port in the router, and configure the router for modem pass-through.

Note: If none of these workarounds is successful, a different fax machine must be used.

Client Matter Code (CMC) Support for FAX Through ATA

In some scenarios, if you first enter the called number on the fax, wait for the tone for CMC, and then enter the CMC digits, the ATA does not pass the CMC digits to the Cisco CallManager. A workaround for this issue is to send all the digits at once: the called number, a pause, and the CMC code. The code registers fine with Cisco CallManager and routes out the call.

Troubleshooting Commands

The Output Interpreter Tool (registered customers only) (OIT) supports certain **show** commands. Use the OIT to view an analysis of **show** command output.

Note: Refer to Important Information on Debug Commands before you use **debug** commands.

These sample command outputs are sample debugs for fax calls made between the Cisco ATA 186 and the gateway for both methods.

This **debug** command output shows a fax call sent from Cisco ATA 186 to AS5300 in Fax Detection Method.

```
!--- Call that is made to 22151 from the ATA.
```

```
Calling 22151  
SCC->(0 0)  
<cmd 16>CLIP  
SCC->(0 0)  
<cmd 2><0 0> dial<32151>  
block queue <- (18 1318384 0)  
Connect to <0xac100d18 1720>..  
>>>>>> TX CALLER ID : 0x1 0x80 6
```

```
!--- Setup Sen to the 5300.
```

```
Q931<-0:Setup:CRV 30970
```

```
!--- Call proceeding received from the 5300.
```

```
Q931->0:Proceeding  
Connect H245...  
block queue <- (19 1318384 555258)  
NuConnectDispatcher: 0x78fa  
H245 TCP conn ac100d18 11076  
CESE/MSDSE start:<0 0 0 0>  
capSize = 3  
H245->0:Cese  
RemoteInputCap <15 5>  
RemoteInputCap <15 4>
```

RemoteInputCap <15 1>
RemoteAudioCap <4 11>
MODE FRAME : 11 2
RemoteAudioCap <4 10>
Capability set accepted
H245->0:MSD: <rn tt> = <0x1274 60>
H245->0:CeseAck
H245->0:MsdAck
h323.c 1826: cstate : 3
->H245<0> OLC
H245<-0:LcseOpen

!--- Codec negotiated is G729A as configured.

set TX audio to G729A 2 fpp
SetG723Mode: 2 0
H245->0:LcseOpen
H245->0:OLC mode 10
remote OpenLogicalReq G711/G729(10) : 2 fpp
OpenRtpRxPort(0,0x0,16384):1
RTP Rx Init: 0, 0
RTP->0:<0xab4555e9 16384>
H245->0:LcseOpenAck
RTP<-0:<0xac100d18 19066>
[0]Enable encoder 18
RTP TX[0]:SSRC_ID = 5e875050
RTP Tx Init: 0, 0
[0]Received pi=8 in q931

!--- Call alerting.

Q931->0:Alerting
[0]DPKT 1st: 3570916113 3570915873, pt 18
Enable LEC adapt [0]=1
H323Dispatcher : 3 3

!--- Call connected.

Q931->0:Connect
SCC:ev=12[0:0] 3 0
0:30;3,0,0,0,

*!--- Fax modem tone detected by the 5300 and
!--- so it sent an NSE packet.*

[0]Rx MTP NSE pkt c0000000
[0]MPT mode 1
SCC:ev=23[0:0] 4 0

*!--- Codec renegotiated to G711ulaw and
!--- modem passthrough mode active on the ATA.*

[0:0]Mdm PassThru
[0]codec: 18 => 8
[0]Rx MTP NSE pkt c1000000
[0]Rx MTP NSE pkt c1000000
[0]Rx MTP NSE pkt c1000000
1:00;2,0,0,0,
1:30;2,0,0,0,

!--- Call complete.

Q931->0:ReleaseComplete: reason 16, tone = 13
H245<-0:EndSessionCmd 1
0: Close RTPRX
[0:0]Rel LBRC Res

Q931<-*:ReleaseComplete

This is the **debug** command output for a fax call received by the Cisco ATA 186 from the 3640 in Fax Mode method.

!--- Call received with DNIS 3000.

```
Q931->*:SetUp:CR = 45
called number : 3000
SetUp routed to 0
Remote alias = 5300-gw
>> callingpartynumber info: 0x0 0x83 5
```

!--- Call proceeding sent.

```
Q931<-0:Proceeding
SCC:ev=21[0:0] 0 0
SCC<-Alerting <5300-gw 208>
SCC:ev=5[0:0] 13 0
```

!--- Ringing the phone on the voice port.

```
[0:0]RINGING
SCC->(0 0) <cmd 3>
CESE/MSDSE start:<0 0 0 0>
capSize = 2
```

!--- Sent call alerting.

```
Q931<-0:Alerting
H245->0:Cese
RemoteInputCap <15 5>
RemoteInputCap <15 4>
RemoteInputCap <15 1>
RemoteAudioCap <4 3>
MODE FRAME : 3 20
Capability set accepted
H245->0:MSD: <rn tt> = <0x17d 60>
H245->0:CeseAckH245->0:MsdAck
h323.c 1826: cstate : 4
->H245<0> OLC
H245<-0:LcseOpen
set TX audio to G711 (3) 20 fpp
```

!--- Codec negotiated is G.711 with VAD disabled.

```
G.711 Silence Suppression off
H245->0:LcseOpen
H245->0:OLC mode 3
remote OpenLogicalReq G711/G729(3) : 20 fpp
OpenRtpRxPort(0,0x0,16384):1
RTP Rx Init: 0, 0
RTP->0:<0xab4555e9 16384>
H245->0:LcseOpenAck
RTP<-0:<0xac100d18 18526>
[0]Enable encoder 0
RTP TX[0]:SSRC_ID = 71d26005
RTP Tx Init: 0, 0
SCC->(0 0) <cmd 4>
```

!--- Call connected.

```
Q931<-0:Connect
Enable LEC adapt [0]=1
```

```
SCC:ev=12[0:0] 6 0
[0]DPKT 1st: 3570916113 3570915873, pt 0
0:30:3,0,0,0,
1:00:3,0,0,0,
SCC->(0 0) <cmd 11>
```

!--- Call complete.

```
H245<-0:EndSessionCmd 1
0: Close RTPRX
Q931<-*:ReleaseComplete
```

Related Information

- **Cisco ATA 186 Basic Configuration**
- **Configuring and Troubleshooting an ATA 186 with Cisco IOS Gatekeepers**
- **Configuring and Troubleshooting an ATA 186 with a Cisco IOS Gateway**
- **Cisco ATA 186 FAQ and Common Issues**
- **Modem Passthrough over VoIP**
- **Recommended Reading: Troubleshooting Cisco IP Telephony**
- **Technical Support & Documentation – Cisco Systems**

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