

Configuring the Unified Communications 500 System for a Fax to Email Application using a Common Line for Fax and Voice

This document provides information on how to configure a Cisco UC500 and the Cisco Unity Express (CUE) module, to combine incoming fax processing and voice on the same POTS line. If a fax call is detected, the system sends it to an email account.

This application uses a Fax Detection mechanism as well as T.37 On-ramp technology, and it requires advanced configuration using the UC500 CLI. Nevertheless, the steps are clearly explained and if followed properly, customers could have this free application up and running in a matter of minutes.

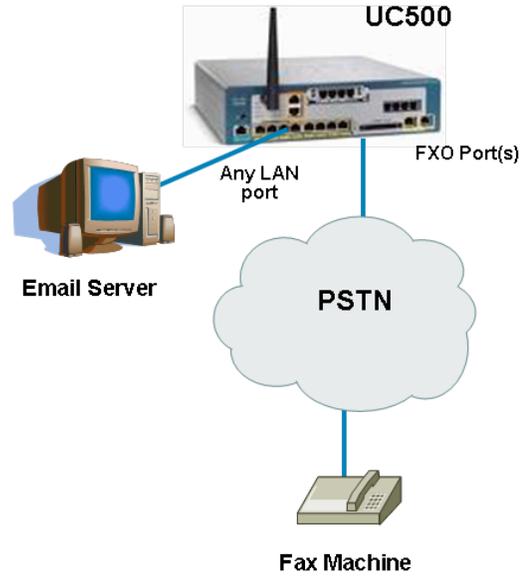
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Basic Topology

The basic topology used for testing this configuration is shown in Figure 1. In addition to the connection shown, the Email Server can also be connected to a Cisco ESW500 switch or similar device behind the UC500.

Figure 1 Basic Topology for fax to Email Application



Feature Description and Operation

Fax detection supports the use of a single E.164 number for both voice mail and fax mail by providing the capability to detect automatically whether an incoming call is voice or fax. Fax detection can be configured to use the distinctive fax calling tones (CNG), a manually dialed digit, or both to distinguish fax calls from voice calls. Fax detection supports the following modes of operation:

- Connect-First Mode
- Listen-First Mode
- Default-Voice Mode
- Default-Fax Mode

The fax detection used in this example is “Listen First”.

Listen-First Mode

When listen-first mode is configured on the gateway and an incoming call is received, the gateway can play a configurable audio prompt to greet the caller or provide instructions.

Note: If an audio file for this prompt has not been specified during configuration, the caller hears 9 seconds of silence. We recommend configuring a prompt.

The gateway listens for CNG for 9 seconds before passing the call to an application or server. If CNG is detected, the call is passed to the fax relay or store-and-forward fax application, whichever is configured on the gateway. If CNG is not heard during the first 9 seconds, the call is passed to the voice-mail server. Non-CNG faxes are not supported in this mode.

If any DTMF tones are detected, the call is connected to the voice server. Once a call is connected to the voice server, DTMF tones are relayed using the DTMF signaling protocol that has been configured on the dial peer.

In listen-first mode, CNG fax calls are never automatically connected to the voice-mail server, so this mode is useful when CNG fax calls constitute a significant proportion of the calls to this E.164 number.

Scope and Assumptions

The procedures and guidelines in this Application Note assume that the Cisco UC500 system has been set up using Cisco Configuration Assistant (CCA) and that the VAR user is familiar with the Cisco IOS Command Line Interface (CLI). Software Pack 7.0.3 and CCA version 2.0 were used in this example.

The Email Server referenced in this document is a free SMTP application that can be obtained from the following site:

<http://www.softstack.com/freesmtp.html>

Configuring the Unified Communications 500 System for Fax Detection

This SMTP server will accept the email message from CUE and it will then relay it to the recipient, over the Internet.

Alternatively, the SMB may decide to integrate with a local Email server (such as Exchange), in which case the SMTP information in CUE should be populated accordingly.

Please note that this implementation makes use of third party software that **HAS NOT** been validated by Cisco beyond what is described in this document. Cisco cannot guarantee the stability, reliability or legitimacy of any of the services provided by the manufacturers of this product.

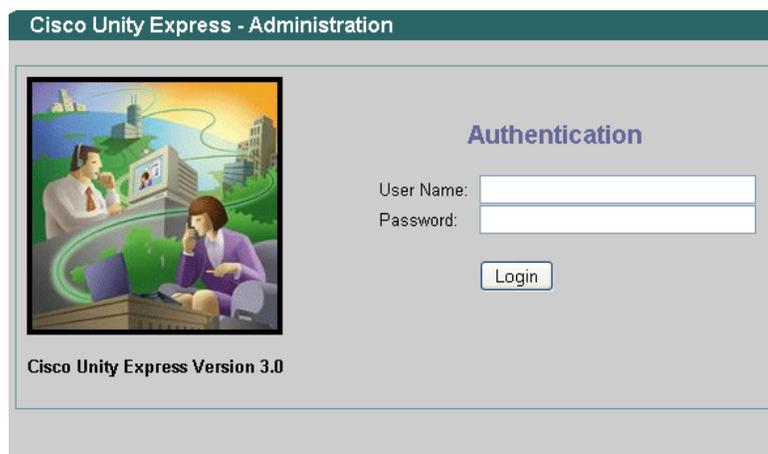
Step by Step Configuration

The following is a step by step guide of what the user needs to do to enable this application:

Connecting to the CUE Administration GUI

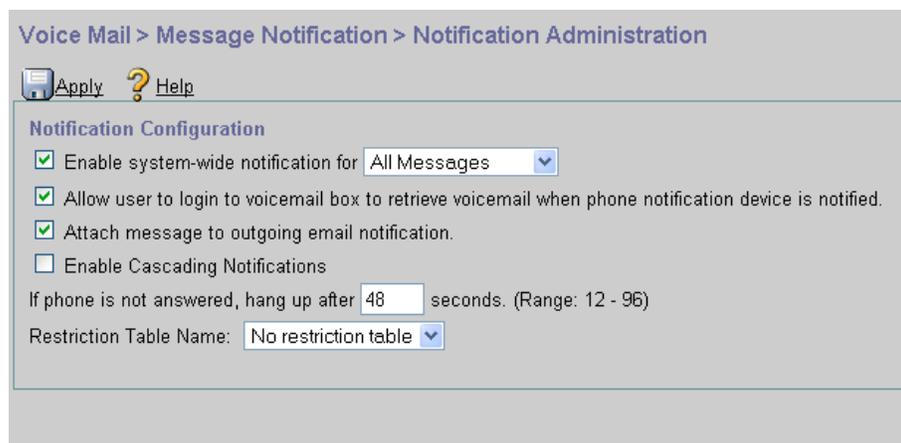
Connect to CUE using the administrator credentials and the following URL:

<http://10.1.10.1>



Enabling System Wide Notifications

Got to **Voice Mail > Message Notification > Notification Administration** to enable Notifications or the users:



Creating a mailbox in CUE for Fax storage

In this step, we will add the user that will be receiving the faxes from the UC500. The example shows us creating a new user, but you could simply access any other user's information and follow similar configuration steps.

Click on **Configure > Users** and fill out the necessary information. Make sure that you define a **Primary Extension** for the Fax recipient. Do not use one of the existing extensions in your system. After you have populated all the necessary fields, make sure that **Create Mailbox** is checked. Click **Add** when you are done.

Configuring the Unified Communications 500 System for Fax Detection

Add a New User

Add Cancel Help

User ID *:

First Name *:

Last Name *:

Nick Name *:

Display Name*:

Associated Phone: [Add/Edit](#) [Remove](#)

Primary Extension: None Other:

Primary E.164 Number:

Fax Number:

Language:

Password options:

Password:

Confirm Password:

PIN options:

PIN:

Confirm PIN:

Create Mailbox

Forward CFNA & CFB of extension (if configured) to Voice Mail number 299

The next screen is for the CUE mailbox configuration. Make sure that **Fax Enable** and **Enable Notifications for this User/Group** are checked. Click **Add**:

Add a New Mailbox

Add Cancel Help

Owner:

Description:

Zero Out (Operator Assistance):

Mailbox Size *: seconds

Maximum Caller Message Size *: seconds

Message Expiry Time *: days

Play Tutorial:

Enabled:

Fax enabled:

Enable notification for this user/group:

* indicates a mandatory field

Go back to **Configure > Users** and click on the newly created user "Fax". Select the **Notification** tab and check the **Email Inbox** option:

User Profile - Fax

Cascading Settings

After min(s), notify

After min(s), notify

Notification Devices

Enabled	Device Type	Destination
<input type="checkbox"/>	Home Phone	
<input type="checkbox"/>	Work Phone	
<input type="checkbox"/>	Cell Phone	
<input type="checkbox"/>	Pager (Numeric)	
<input type="checkbox"/>	Text Pager	
<input checked="" type="checkbox"/>	Email Inbox	

Click on the **Email Inbox** link to display the notification details. In this example, the recipient is a list of users called "fax@cisco.com". **Notification Preference** needs to be set to **All Messages** and the **Attach message to outgoing email notification** checkbox needs to be checked. You can also specify the hours and timeframes to receive notifications. Click **Apply** when you are done:

User Profile - Fax

Configure Notification Device - Email Inbox

Enable notification to this device

To:(Email Address)

Text for Email:

Notification Preference

Attach message to outgoing email notification.

Notification Schedule

	S	M	T	W	T	F	S
00:00 AM	<input type="checkbox"/>						
00:30 AM	<input type="checkbox"/>						
01:00 AM	<input type="checkbox"/>						
01:30 AM	<input type="checkbox"/>						
02:00 AM	<input type="checkbox"/>						
02:30 AM	<input type="checkbox"/>						

Quick Add

Day:

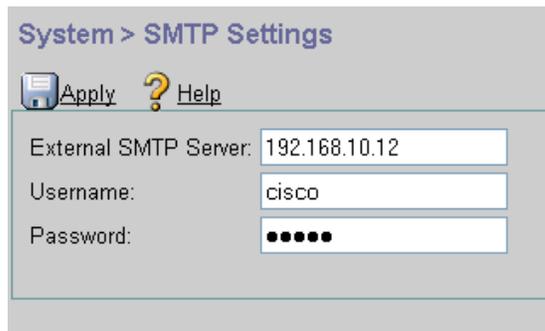
Start Time:

End Time:

Copy Day's Schedule >>

Configuring the SMTP Server Settings

The next step is to configure the SMTP Server that CUE will use to deliver emails. Click on **System > SMTP Settings** and populate the fields accordingly. In this example, the SMTP server is installed on a computer with IP 192.168.10.12. The Free SMTP software requires no authentication, so the credentials on this screen are bogus. When using a real SMTP service, you will need to provide a valid username and password:



System > SMTP Settings

Apply Help

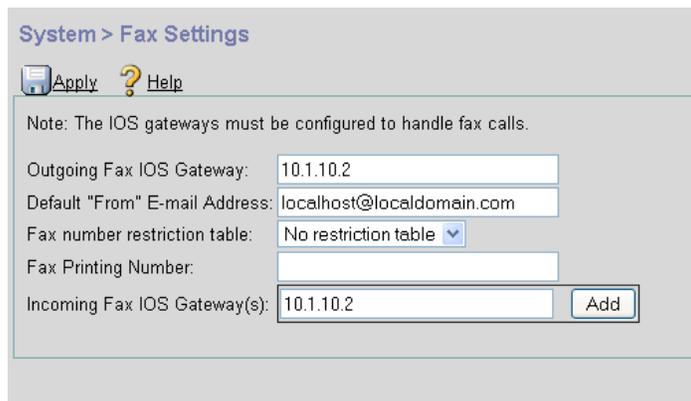
External SMTP Server: 192.168.10.12

Username: cisco

Password: ●●●●●●

Configuring the Fax Settings

Enable the inbound fax gateway on CUE. Navigate to **System > Fax Settings** and enter the IP address of the UC500, 10.1.10.2:



System > Fax Settings

Apply Help

Note: The IOS gateways must be configured to handle fax calls.

Outgoing Fax IOS Gateway: 10.1.10.2

Default "From" E-mail Address: localhost@localdomain.com

Fax number restriction table: No restriction table

Fax Printing Number:

Incoming Fax IOS Gateway(s): 10.1.10.2 Add

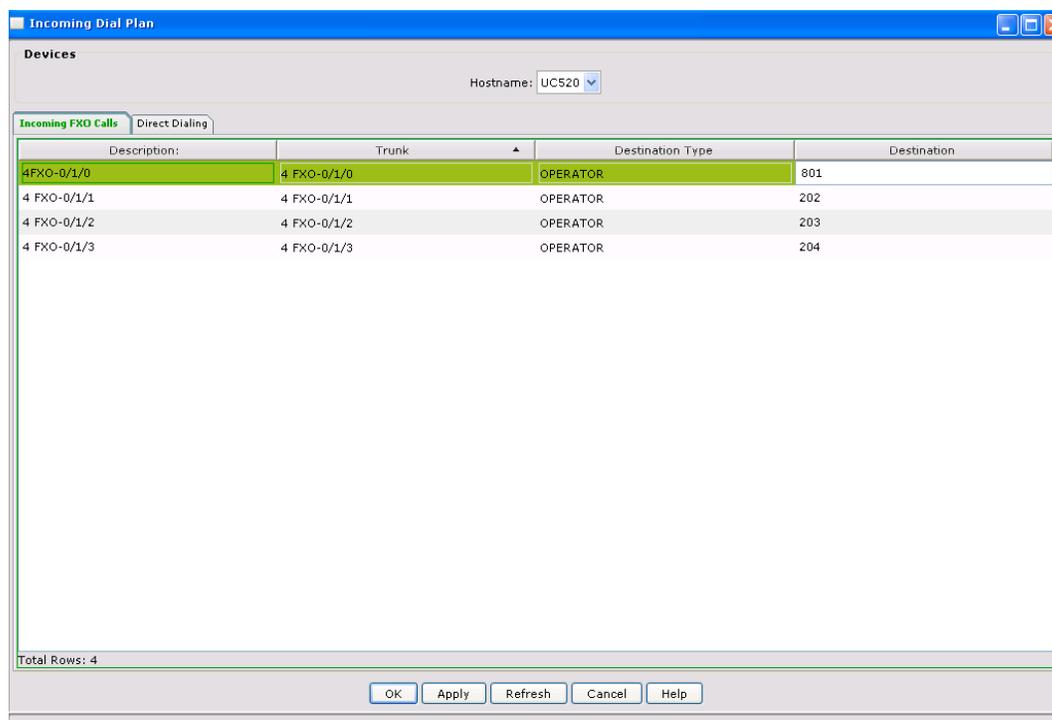
This completes the CUE configuration. You can proceed to the next section in order to configure the fax settings on the UC500.

Using CCA to Send Calls to the Fax Mailbox

In this step, we will configure the FXO port to automatically invoke the detect script and play a prompt that will allow the user to press "Start" on the fax machine to send a fax, or hit any DTMF key to be transferred to extension 801. For this, open the **Cisco Configuration Assistant**, login to the UC500 and navigate to **Configure > Telephony > Dialplan > Incoming**.

Select the **Incoming FXO Calls** tab and enter the **Destination Type** for the fax mailbox extension (801). Make sure you select the FXO port that has the Fax Line connected to it, 0/1/0 in this case.

Configuring the Unified Communications 500 System for Fax Detection



Click **Apply** and then **OK**.

The next steps are necessary to load the TCL script that handles the fax detection and the T.37 Onramp application.

Downloading and Installing the Fax Detect TCL Script

Connect to the following URL and download the file named **app_fax_detect.2.1.2.3.zip** (Cisco.com access is required):

<http://www.cisco.com/cgi-bin/tablebuild.pl/tclware>

Unzip the file and copy the script named **app_fax_detect.2.1.2.3.tcl** and all the prompt files, to the UC500 flash using TFTP. In this example, the files are being placed in the "flash:/bacdprompts/" directory. For instructions on how to load files to the UC500 using TFTP, visit:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1828/prod_release_note09186a00800810f3.html

Connect to the UC500 using Telnet or SSH and enter the following commands in configuration mode:

```
UC520#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
UC520(config)#application
UC520(config-app)#service fax_detect flash:/bacdprompts/app_fax_detect.2.1.2.3.tcl
UC520(config-app-param)# param prompt flash:/bacdprompts/en_Uone_listen-first.au
UC520(config-app-param)# param mode listen-first
UC520(config-app)#end
UC520#
```

This will load in memory the file you just copied.

The next step is to identify the dial peers associated with your FXO port (or ports). In this example, the FXO port connected to the fax line is **0/1/0**. While on the UC500, execute the following command:

```
UC520#sh dial-peer voice summary | include 0/1/0
50      pots up up 0/1/0
54      pots up up 0/1/0
55      pots up up 0/1/0
56      pots up up 0/1/0
57      pots up up 0/1/0
```

Dial-peers 50, 54, 55, 56 and 57 are mapped to FXO port 0/1/0. We will need to associate the Onramp application to each one of those peers. This example shows how to do it for 50. Repeat the following steps for all the dial-peers that you identified earlier:

```
UC520#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
UC520 (config)#dial-peer voice 50
UC520 (config-dial-peer)#service fax_detect
```

Configuring the MTA Settings and MMoIP Dial-peer

The following commands are needed to complete the configuration for this application:

```
UC520#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
UC520 (config)#fax interface-type fax-mail
UC520 (config)#mta send server 10.1.10.1 port 25
UC520 (config)#mta send with-subject both
UC520 (config)#mta send mail-from hostname cisco.com
UC520 (config)#mta send mail-from username Line1

UC520 (config)#dial-peer voice 5500 mmoip
UC520 (config-dial-peer)# service fax_on_vfc_onramp_app out-bound
UC520 (config-dial-peer)# destination-pattern 801
UC520 (config-dial-peer)# information-type fax
UC520 (config-dial-peer)# session target mailto:801@10.1.10.1
```

After you configure all of the above, exit configuration mode and save your work:

```
UC520 (config-dial-peer)#end
UC520#write memory
Building configuration...
Compressed configuration from 22733 bytes to 10150 bytes[OK]
UC520#
```

A reboot is required in order to proceed:

```
UC520#reload
Proceed with reload? [confirm]
```

Starting the SMTP Server on the computer

Free SMTP Server is installed and running on the PC with IP 192.168.10.12, which is the destination configured on CUE.

This step is specific to this sample implementation. In a real deployment, a more secure and stable Server must be used (e.g. Exchange). Optionally, you can configure CUE to connect to the SMTP server provided to you by your ITSP.

The system is ready to receive faxes. The UC500 will send the fax to CUE and CUE will forward it to the recipient configured under the notification settings.

Sending a Fax Message or Making a Phone Call

To test your configuration, dial the number associated with the line connected to the FXO port. After a couple of rings, you will hear a prompt asking you to press “Start” on your fax machine to send a fax or any other DTMF key to place the call as a voice call. Notice that if you select the voice option, a call to extension “801” will be placed. “801” can be a user’s private line or a blast group, for example. If the fax option is selected, the message is sent to CUE and stored there as a TIF attachment, in the voicemail box of extension 801.

Monitoring Fax Messages

CUE offers a very simple way to see how many messages are stored in the Fax Mailbox. Connect to CUE and navigate to **Reports > Mailboxes**. The number of faxes will be listed under the **Fax** column under the Fax user:

Reports > Mailboxes

1 - 5 of 5 result(s)

 Owner	# Msgs	New	Saved	Deleted	Broadcast	Future	Fax	Time (secs)
Fax	1	1	0	0	0	0	1	12
phonea	0	0	0	0	0	0	0	0
phoneb	0	0	0	0	0	0	0	0
phonec	0	0	0	0	0	0	0	0
phoned	0	0	0	0	0	0	0	0

Additionally, you can dial the voicemail pilot number from any phone connected to the UC500, enter the Fax mailbox ID (extension 801 in this example) and the PIN. The system will notify you about the new fax message and will give you the time at what it was left.

Sending a Fax to a Local Fax Machine (Optional)

The UC500 can be configured to send faxes that are stored in CUE, to a local fax machine for printing. The following steps describe the process and show how the Offramp script (email to fax) is configured:

Reconfiguring the FXS port to accept faxes

In this example, the local fax machine is connected to FXS port 0/0/0. For faxes to work the port needs to be reconfigured and SCCP needs to be disabled.

You will need to identify the default dial-peer associated to your FXS port. Typically, dial-peer 1 corresponds to port 0/0/0, 2 to 0/0/1, 3 to 0/0/2 and 4 to 0/0/3. Since this examples uses port 0/0/0,

dial-peer 1 needs to be shutdown:

```
UC520#configure terminal
UC520 (config) #dial-peer voice 1 pots
UC520 (config-dial-peer) # shutdown
```

Next, configure an extra dial-peer and the voice port for proper fax call routing. In this case, the fax machine attached to the FXS port will have the number "2222":

```
UC520 (config) #dial-peer voice 2501 pots
UC520 (config-dial-peer) # destination-pattern 2222
UC520 (config-dial-peer) # port 0/0/0
```

Configuring T.37 Offramp (email to fax)

Configure the Offramp application by installing the script that does email to fax conversion. Connect to the following URL and download the file named **app_faxmail-offramp.2.0.1.1.zip** (Cisco.com access is required):

<http://www.cisco.com/cgi-bin/tablebuild.pl/tclware>

Unzip the file and copy the script named **app_faxmail-offramp.2.0.1.1.tcl** and all the prompt files, to the UC500 flash using TFTP. In this example, the files are being placed in the "flash:/bacdprompts/" directory. For instructions on how to load files to the UC500 using TFTP, visit:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1828/prod_release_note09186a00800810f3.html

Connect to the UC500 using Telnet or SSH and enter the following commands in configuration mode:

```
UC520#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
UC520 (config) #application
UC520 (config-app) #service offramp flash:/bacdprompts/app_faxmail-
offramp.2.1.1.1.tcl
UC520 (config-app) # exit
UC520 (config) # mta receive aliases 10.1.10.2
UC520 (config) # mta receive maximum-recipients 7
UC520 (config) # dial-peer voice 5501 mmoip
UC520 (config-dial-peer) # service offramp
UC520 (config-dial-peer) # incoming called-number 2222
UC520 (config-dial-peer) # information-type fax
UC520 (config-dial-peer) # dsn success
UC520 (config-dial-peer) # dsn delayed
UC520 (config-dial-peer) # dsn failure
UC520 (config-dial-peer) # exit
UC520# write memory
```

The last step is to configure CUE to send faxes to the "2222" number: Enable the outbound fax gateway on CUE. Navigate to **System > Fax Settings** and enter the IP address of the UC500, 10.1.10.2 and the phone number for the fax machine:

System > Fax Settings

Apply Help

Note: The IOS gateways must be configured to handle fax calls.

Incoming Fax IOS Gateway: 10.1.10.2

Outgoing Fax IOS Gateway: 10.1.10.2

Fax Printing Number: 2222

Default "From" E-mail Address:

Fax number restriction table: No restriction table

After you configure all of the above, exit configuration mode and save your work:

```
UC520(config-dial-peer)#end
UC520#write memory
Building configuration...
Compressed configuration from 22733 bytes to 10150 bytes[OK]
UC520#
```

You can print fax messages directly from the Telephony User Interface (TUI):

- Dial-in to the voicemail of an IP phone that has received a fax message.
- Press 1 listen to messages.
- Press 8 to send to fax machine.
- Press 1 to verify fax machine number.
- If fax machine is connected a fax will print to fax machine.
- If PC is connected a fax will be sent to Windows XP Fax Console inbox

Additionally, you can print the fax using VoiceView Express (VVE):

- Logon to VVE from an IP phone that has received a fax message.
- Select **Inbox**. Click on fax message.



- Select **More** followed by **Options** softkey



- Select **Print to Fax Machine**



If fax machine is connected a fax will print to fax machine.

For More Information

For more information, visit the SBCS Support Community at:

<http://www.cisco.com/go/smallbizsupport>



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