# Configuring VoIP Fax Relay Using CallManager and a Voice Gateway

## Document ID: 13949

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# Introduction

This document explains how to force fax calls to use Voice over IP (VoIP) Fax Relay rather than local hairpinning. This functionality is useful in a scenario that includes a Primary Rate ISDN (PRI) port accepting voice and fax calls. The voice calls are directed to IP phones and the fax calls are directed to Foreign Exchange Station (FXS) ports on the same router.

Local hairpinning of analog calls on a router without a time−division multiplexing (TDM) bus makes those calls subject to delay on the router backplane and Digital Signal Processor (DSP) buffers, and therefore unreliable. VoIP in general, and Fax Relay specifically, overcomes this problem for fax calls by terminating them directly on the router DSP.

This forced Fax Relay is accomplished when you route the incoming fax call setup to the Cisco CallManager server, and then immediately redirect it to the same gateway.

In summary, the gateway now terminates the fax call using Fax Relay on one leg, establishes a VoIP Fax Relay call between its voice cards routed through the Cisco CallManager, and then re−establishes the fax call on the FXS call leg.

**Note:** Only the call setup messages pass through the Cisco CallManager. After the VoIP call is established, data travels directly between the ingress and egress DSPs on the gateway voice cards.

# Prerequisites

## Requirements

There are no specific requirements for this document.

## Components Used

The information in this document is based on the software and hardware versions:

- Cisco CallManager versions 3.x and 4.x

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.

### Conventions

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

## Configure the Cisco CallManager Server to Route the Fax Calls

Use this procedure to configure the Cisco CallManager server to route the fax calls.

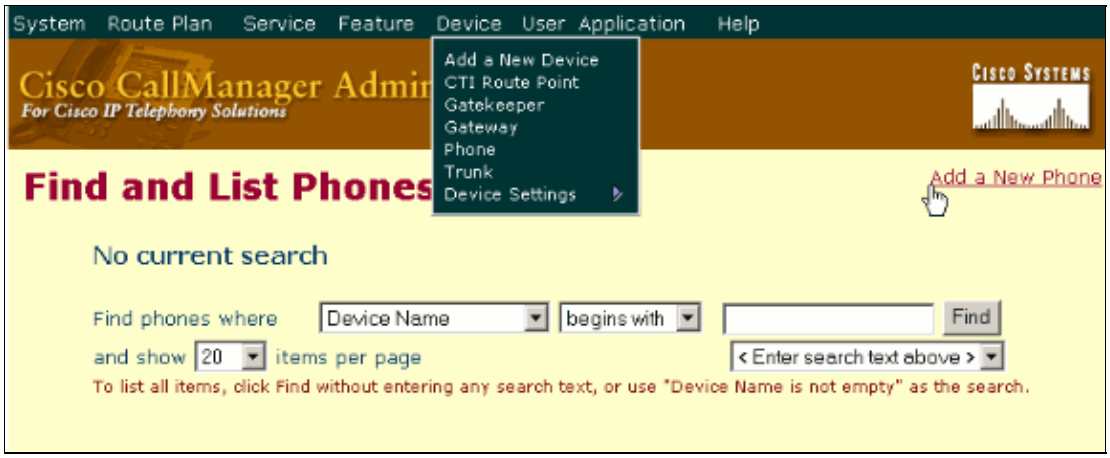
**Note:** The setup in this document makes use of Cisco CallManager 3.0. However, the concept is relevant for all versions of Cisco CallManager including 3.x and 4.x.

### Step−by−Step Instructions

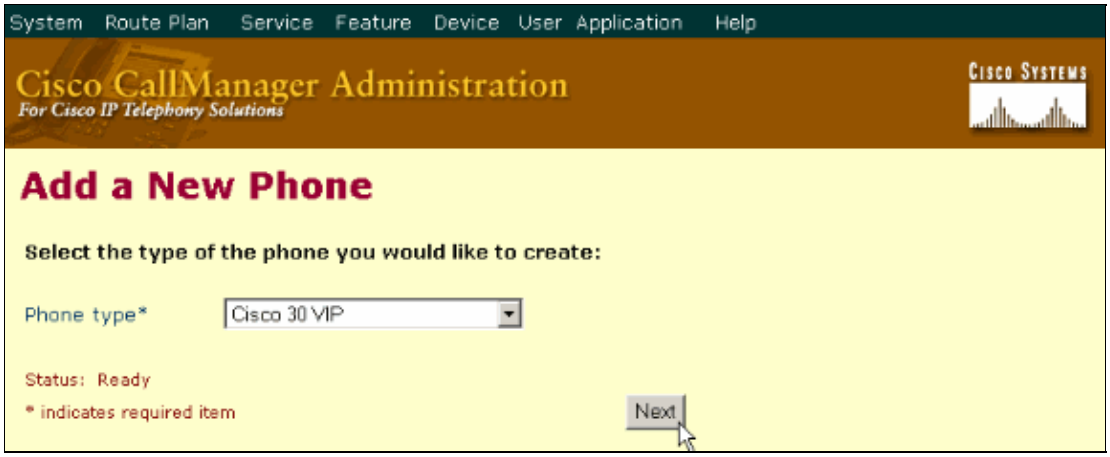
Complete these steps to configure the Cisco CallManager server to route fax calls.

1. Select **Device** > **Phone** > **Add New Phone** to create a dummy extension.

   In this case, Phone Type Cisco 30 VIP is used.



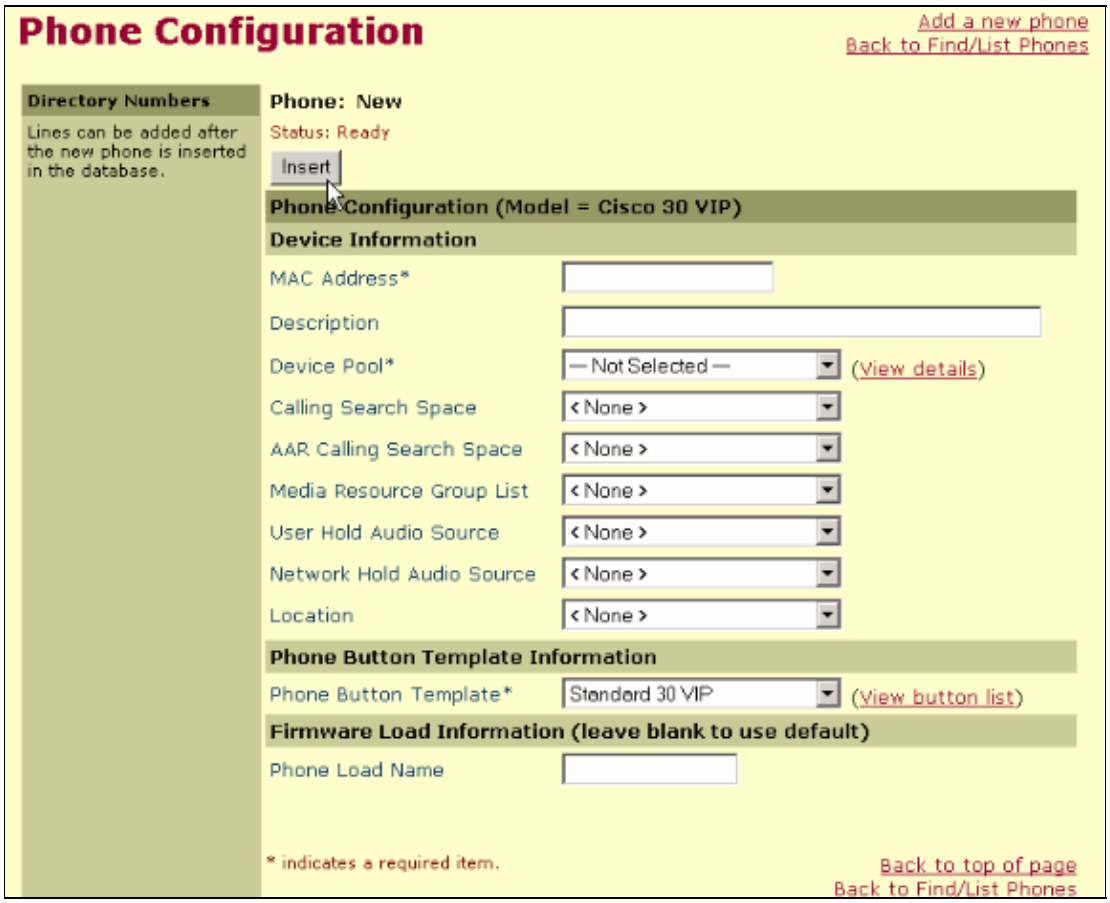

2. Insert a dummy MAC address in the MAC address field. For instance, 00AABBCCDDEE.
3. In the Button Template field, be sure to select a 30 VIP handset (it has plenty of line appearances) and insert it into the database.



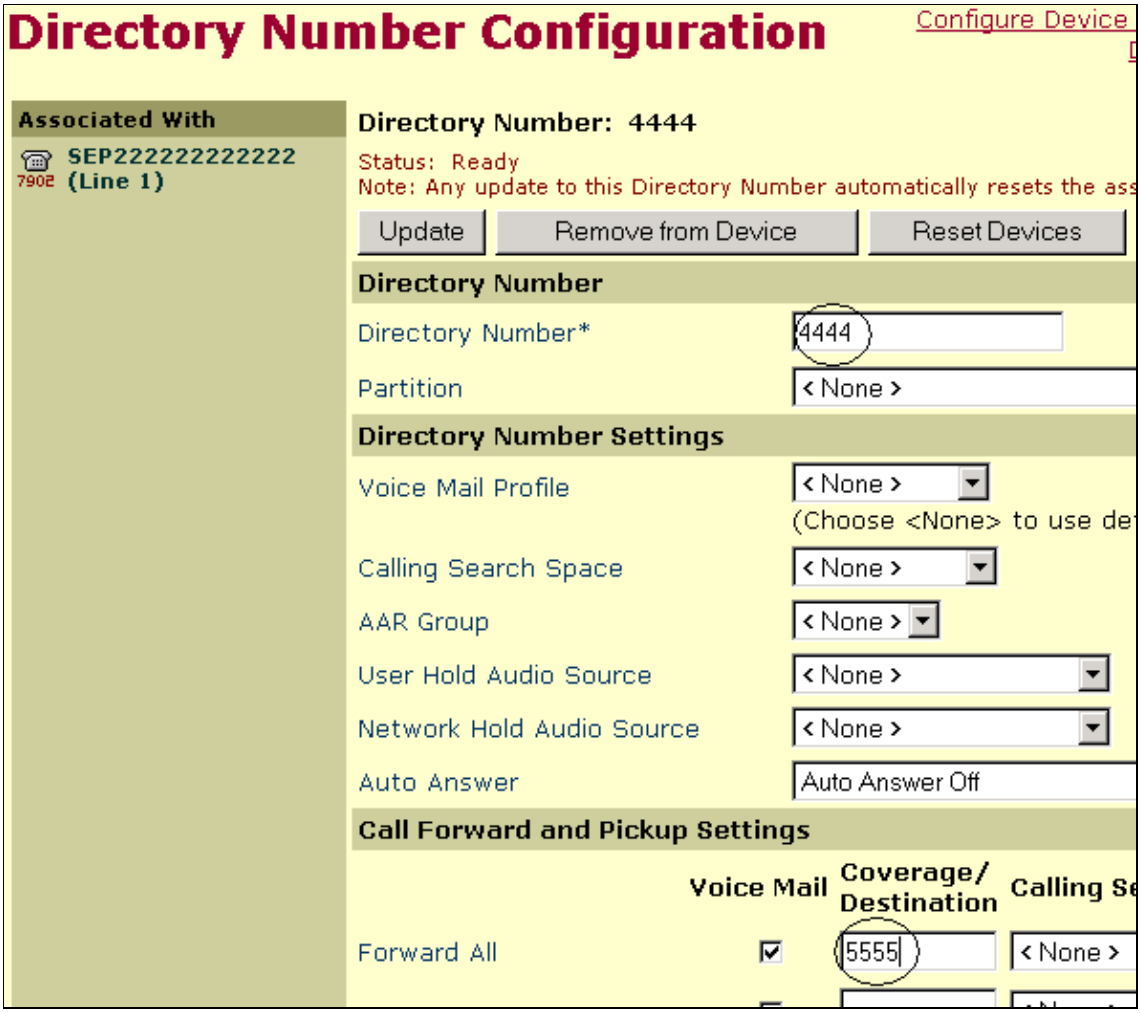

Assume these for the dummy extension (use any numbers that are available on your system):

- line 1 is extension 4444, call forward always to 5555
- line 2 is extension 4445, call forward always to 5556
- line 3 is extension 4446, call forward always to 5557
- line 4 is extension 4447, call forward always to 5558

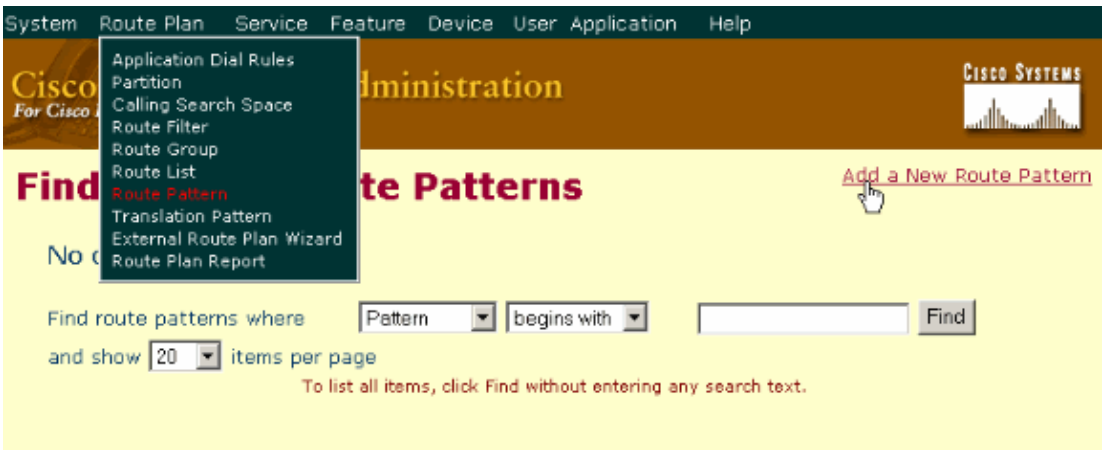
The Call Forward Always settings route patterns that point back out to the H.323 gateway, specifically to the FXS ports. This forces the router to establish a VoIP call. Therefore, it should use Fax Relay to terminate the fax call on one leg and bridge it to the FXS call leg.

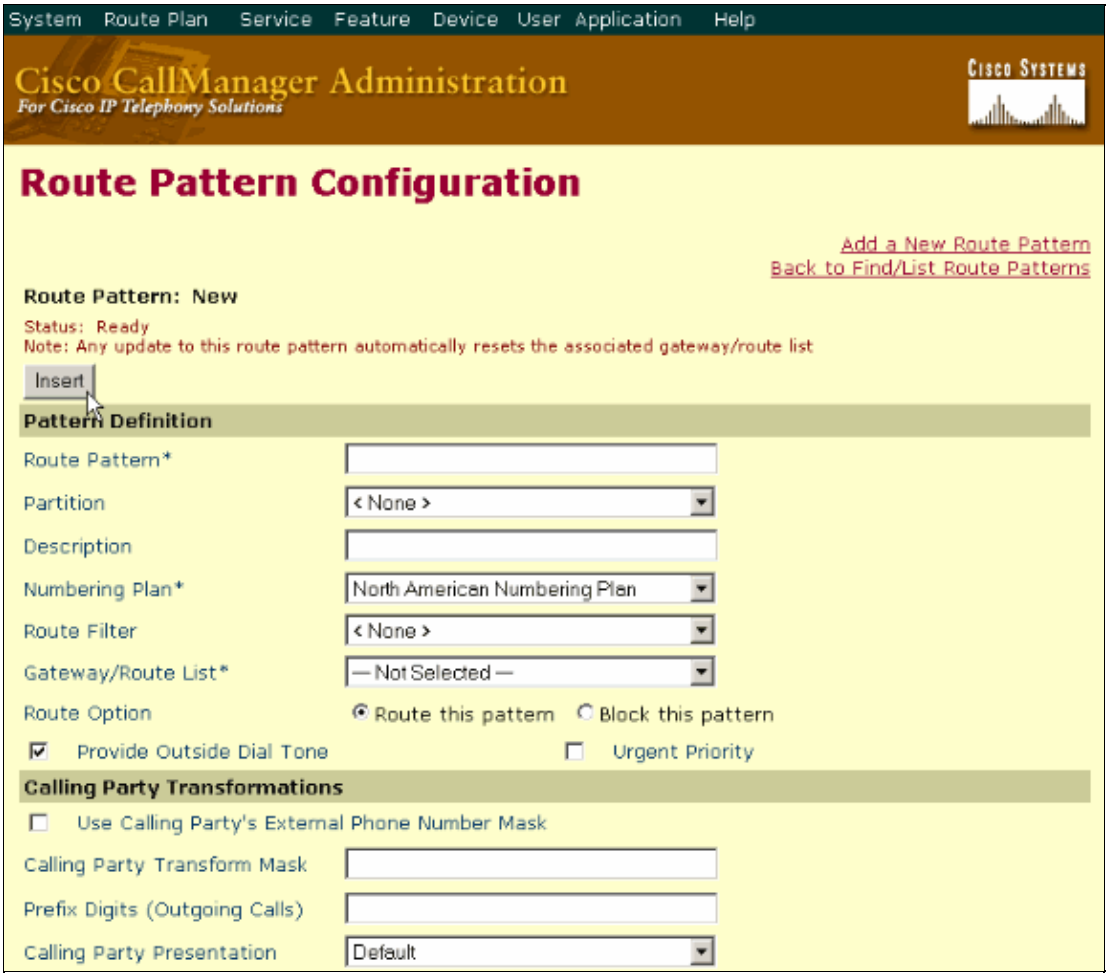



4. Click on the first line appearance and enter a dummy number in the Directory Number field. In this example 4444 is used. Then, enter a Forward All number that points back to the FXS destination pattern. This example uses 5555.




5. In the VoIP world, route patterns are the equivalent of static routes. The only difference is that route patterns point to an E.164 number instead of an IP address. Create and insert a Route Pattern that matches the forward all number from the dummy extension and direct this to the H.323 gateway with the FXS ports (the H.323 gateway must have been added previously). In order to do this, go to the Route Plan menu and select **Route Plan** > **Route Pattern** > **Add a New Pattern**.






6. Go back to the Dummy Extension Configuration page and add a new line number, (for example, 4445) and call forward all numbers (5556). Create a new Route Pattern that matches the Call Forward All number and points to the H.323 gateway. Repeat this for each fax line you have.

## Configure the Gateway

On the gateway, create these VoIP and plain old telephone server (POTS) dial−peers:

```
!
Dial−peer voice 1 voip
 Destination−pattern 444.

!−−− Wildcard match for 444X numbers.

 Session target ipv4:172.16.1.252
 Codec g711ulaw
 Ip precedence 5
 Dtmf−relay h245−alpha
!
dial−peer voice 5555 pots
 destination−pattern 5555
 port 1/0/0
!
dial−peer voice 5556 pots
 destination−pattern 5556
 port 1/0/1
 !
dial−peer voice 5557 pots
 destination−pattern 5557
 port 1/1/0
```

```
!
dial-peer voice 5558 pots
 destination-pattern 5558
 port 1/1/1
```

You should now be able to receive fax calls on your system.

## Verify

Use the **show voice call summary** command to verify the change of the codec when the fax call is processed by the DSP.

Certain **show** commands are supported by the Output Interpreter Tool ( registered customers only) , which allows you to view an analysis of **show** command output.

## Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

## Related Information

- **Configuring Cisco Fax Relay**
- **Fax Relay Troubleshooting Guide**
- **Configuration on a Cisco WS−X6624 with an H.323 Gateway**
- **Voice Technology Support**
- **Voice and IP Communications Support**
- **Troubleshooting Cisco IP Telephony**
- **Technical Support & Documentation − Cisco Systems**

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