



Dialogic[®] Brooktrout[®] SR140 Fax Software with Cisco Unified Communications Manager 7.0

Installation and Configuration Integration Note

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1 Scope

This document is intended as a general guide for configuring a basic installation of the **Cisco Unified Communications Manager Version 7.0 (CUCM 7.0)** for use with Dialogic® Brooktrout® SR140 Fax over IP (FoIP) software platform. The interoperability includes **SIP, H.323 and MGCP** call control and T.38/T.30 media.

There are four (4) call control configurations described within this Configuration Note, specifically:

Configuration	1	2	3	4
Protocol Between Fax Server and CUCM	H.323	SIP	H.323	SIP
Protocol Between CUCM and Gateway	H.323	SIP	MGCP	MGCP

The specific version of CUCM tested was 7.0.1.11000-2

The following systems were used for the sample configuration described in the document.

This document is not intended to be comprehensive and thus does not replace the manufacturer's detailed configuration documentation. Users of this document should already have a general knowledge of how to install and configure the **CUCM 7.0**.

The sample configuration shown and/or referred in the subsequent sections was used for lab validation testing by Dialogic. Therefore, it is possible and even likely that the example configuration will not match the exact configuration and versions that would be present in a deployed environment. However, the sample configuration does provide a possible starting point to work with the equipment vendor for configuring your device. Please consult the appropriate manufacturer's documentation for details on setting up your specific end user configuration.

For ease of reference, the Dialogic® Brooktrout® SR140 Fax Software and Dialogic® Brooktrout® TR1034 Fax Boards will sometimes be denoted herein, respectively, as SR140 and TR1034. The Cisco Unified Communications Manager will be denoted herein as CUCM 7.0 or Cisco CUCM 7.0, or some other form thereof. All references to the SDK herein refer to the Dialogic® Brooktrout® Fax Products SDK.

2 Prerequisites

No special requirements to note.

3 Summary of Limitations

No special limitations to note.

4 H.323 / H.323 Configuration Details

4.1 Cisco Unified Communication Manager 7.0 – H.323 / H.323 Configuration

Vendor	Cisco
Model	Cisco Unified Communication Manager
Software Version	7.0.1.11000-2
Protocol to SR140	H.323
Protocol to Gateway	H.323

4.2 Cisco 2800 Gateway

Vendor	Cisco
Model	Cisco 2800 Integrated Service Router
Software Version	Cisco IOS Software, 2800 Software (C2800NM-SPSERVICESK9-M), Version 12.4(3i), RELEASE SOFTWARE (fc2)
PSTN Device	Dialogic® Brooktrout® TR1034 Fax Board
Protocol to PSTN Device	T1 Robbed Bit Signaling with E&M Wink Start signal protocol
IP Device	Dialogic® Brooktrout® SR140 Fax Software and Cisco CUCM 7.0
Protocol to CUCM	H.323

4.3 Dialogic® Brooktrout® SR140 Fax Software

Vendor	Dialogic
Model	Dialogic® Brooktrout® SR140 Fax Software
Software Version	SDK 5.2.7 SDK 6.0.2 SDK 6.1.0
Protocol to CUCM	H.323
callctrl.cfg file	SDK 5.2.7 – All defaults except set h323_H245Stage = 3 SDK 6.02 – All defaults SDK 6.1.0 –All defaults

4.4 Dialogic® Brooktrout® TR1034 Fax Board

Vendor	Dialogic
PSTN Device	Dialogic® Brooktrout® TR1034 Fax Board
Software Version	SDK 5.2.7 SDK 6.0.2 SDK 6.1.0
Protocol to GW	T1 Robbed Bit Signaling with E&M Wink Start signal protocol
callctrl.cfg file	All defaults

4.5 Network System Configuration – H.323 / H.323 Configuration

The diagram below details the sample configuration used in connection with the H.323 / H.323 Configuration.

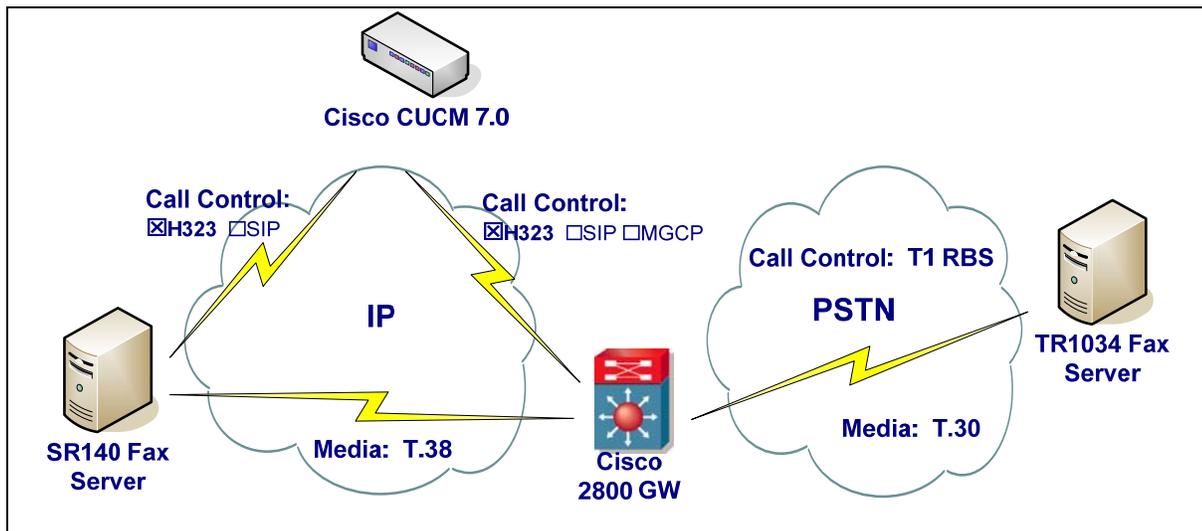


Diagram Notes:

- SR140 Fax Server = Fax Server including Dialogic® Brooktrout® SR140 Fax Software and third party fax application
- TR1034 Fax Server = Fax Server including Dialogic® Brooktrout® TR1034 Fax Board and third party fax application

4.5.1 Network Addresses

Device #	Device Make, Model, and Description	Device IP Address
1	Dialogic® Brooktrout® SR140	10.50.50.101
2	Cisco Unified Communication Manager 7.0	10.50.50.20
3	Cisco 2800 Integrated Service Router	10.50.50.21

4.5.2 Dialing Plan Overview

To call the SR140 from a POTS phone, dial 101101xxx, where x is a number between 0 and 9.

POTS(dial 101101xxx)—T1 RBS—>
Gateway(dial 101101xxx@10.50.50.20)—H.323—>
CUCM7.0(dial 101101xxx@10.50.50.101)—H.323—>SR140

To call the POTS lines of the Gateway, dial 100021xxx@10.50.50.20, where x is a number between 0 and 9, from the SR140.

SR140(dial 101021xxx@10.50.50.20)—H.323—>
CUCM7.0(dial 101021xxx@10.50.50.21)—H.323—>
Gateway(dial 101021xxx)—T1 RBS—>POTS

4.6 Dialogic® Brooktrout® SR140 Fax Software Setup Notes

For the sample test configuration using SDK 6.0 and later, the SR140 was configured using the default values.

For previous SDKs, the following parameter in the callctrl.cfg file must be set to 3: h323_H245Stage = 3

The callctrl.cfg file can be modified via the GUI Brooktrout Configuration Tool. The parameter h323_H245Stage can be found when you launch this tool in Advanced Mode for H323. Consult the Dialogic® Brooktrout® Fax Products Installation and Configuration Guide for details.

The Installation and Configuration Guides for SDK 5.2.x, SDK 6.0.x and SDK 6.1.x are available from the site:

<http://www.dialogic.com/manuals/brooktrout/default.htm>

Note: DHCP cannot be used.

4.7 Dialogic® Brooktrout® TR1034 Fax PSTN Setup Notes

For the sample test configuration, the TR1034 was configured using the default values, consult the Dialogic® Brooktrout® Fax Products Installation and Configuration Guide for details.

4.8 Cisco 2800 Gateway Setup Notes

For the sample test configuration, the Cisco 2800 Gateway was configured the Cisco IOS Command-Line Interface. The specific items configured include:

- Enable T.38 support
- Configure line card interface
- Configure IP Protocol
- Configure Dial-Peers – POTS
- Configure Dial-Peers – VoIP

4.8.1 Enable T.38 support

The following lines will allow T.38 fax calls.

```
voice service voip
    fax protocol t38 ls-redundancy 2 hs-redundancy 0 fallback none
```

4.8.2 Configure line card interface

The following lines will allow T1 Robbed Bit Signalling with E&M Wink Start signal protocol.

```
controller T1 0/0/0
    framing esf
    clock source internal
    linecode b8zs
    cablelength short 133
    ds0-group 0 timeslots 1-24 type e&m-wink-start dtmf dnis
    description E&M Wink Start T1-RBS
```

Note: the ds0-group line must contain dtmf dnis when doing Wink Start.

4.8.3 Configure IP Protocol

The following will allow H.323 calls.

```
voice service voip
    fax protocol t38 ls-redundancy 2 hs-redundancy 0 fallback none
    h323
        session transport udp
```

Note: session transport must contain udp.

4.8.4 Configure Dial-Peers - POTS

The following will allow the phone numbers 101021000 to 101021999 to be dialed out through the POTS lines.

```
dial-peer voice 101021000 pots
  destination-pattern 101021[0-9][0-9][0-9]
  no digit-strip
  direct-inward-dial
  port 0/0/0:0
```

4.8.5 Configure Dial Peers - VoIP

The following will allow the phone numbers 101101000 to 101101999 to be dialed out through H.323 to CUCM.

```
dial-peer voice 101101000 voip
  description H323 to CUCM
  destination-pattern 101101...
  voice-class h323 1
  session target ipv4:10.50.50.20
  session transport udp
  codec g711ulaw
```

Note: The session target ipv4 contains the IP address for CUCM.

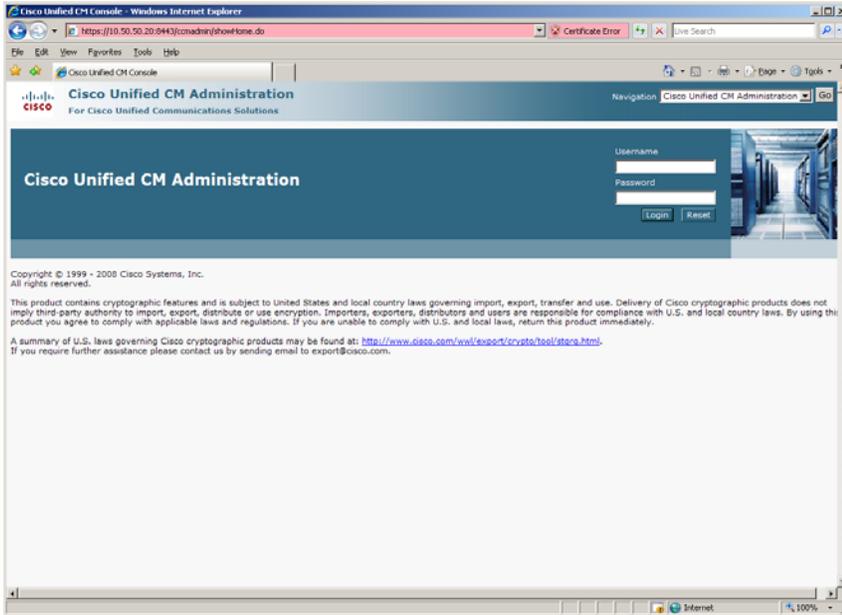
4.9 CUCM 7.0 Setup Notes – H.323 / H.323 Configuration

The CUCM 7.0 configuration values that were used in the sample configuration involve configuring the following items:

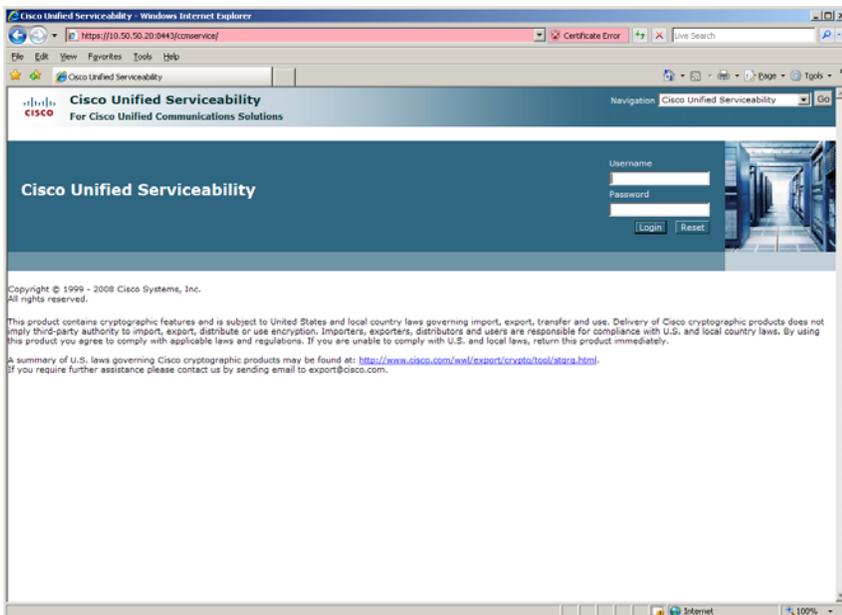
- Configure Service Activation
- Configure License
- Configure SR140 Trunk
- Configure Gateway Trunk
- Configure Call Routing

4.9.1 Configure Service Activation

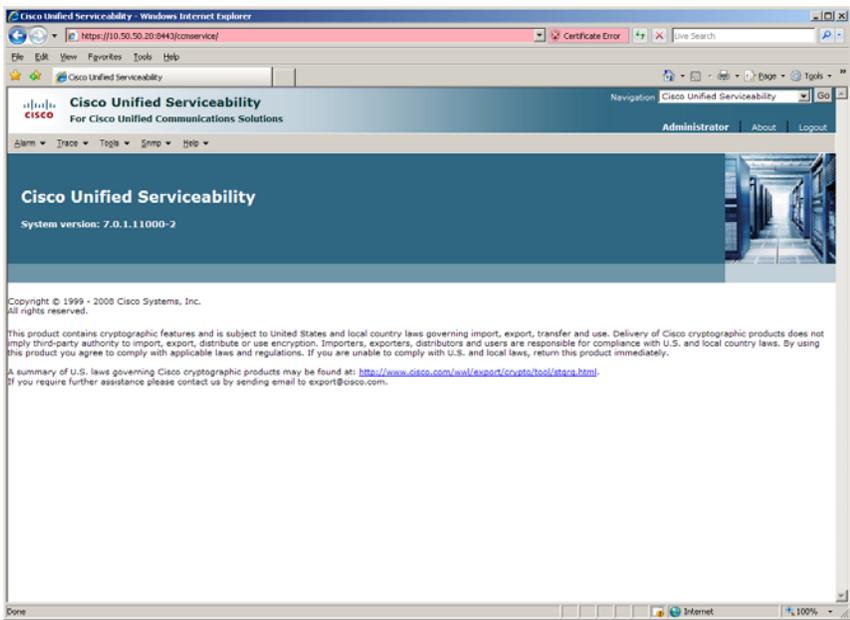
Using a web browser, log into CUCM 7.0. The following Cisco Unified CM Administration screen appears.



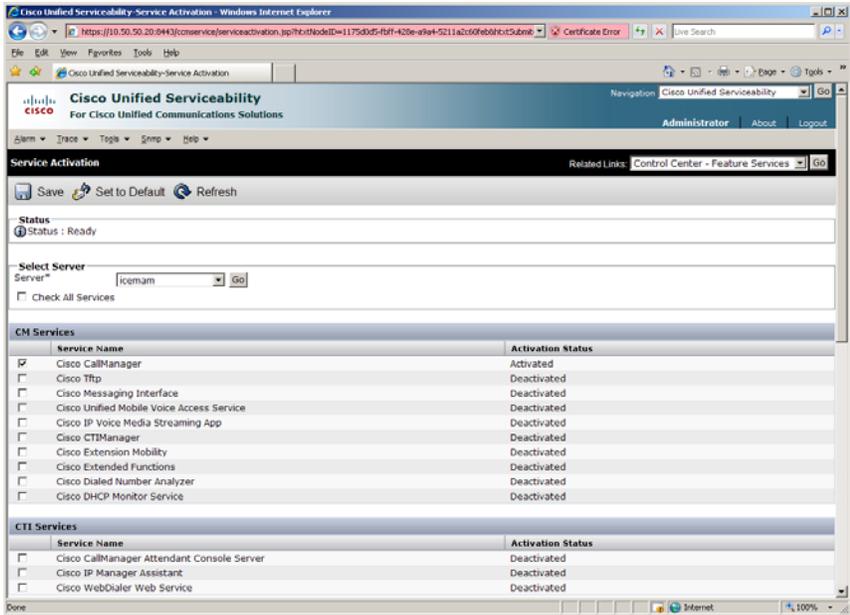
Select from the Navigation menu the option Cisco Unified Serviceability and press Go. The following Cisco Unified Serviceability screen appears.



Enter the username and password and press Login. The following screen appears.



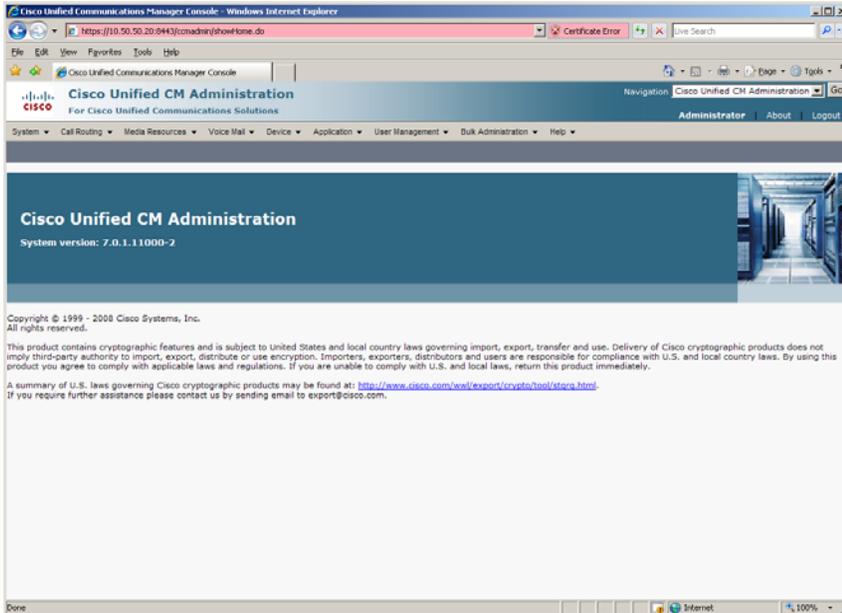
From the menu select Tools | Service Activation.



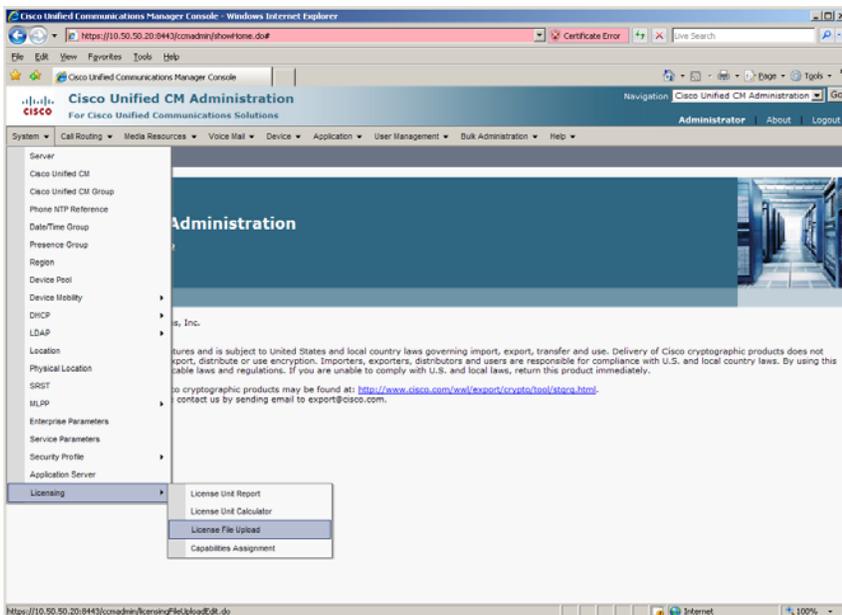
Select the server from the Sever pulldown menu. Under the CM Services, select Cisco CallManager, at the minimum and then press Save.

4.9.2 Configure License

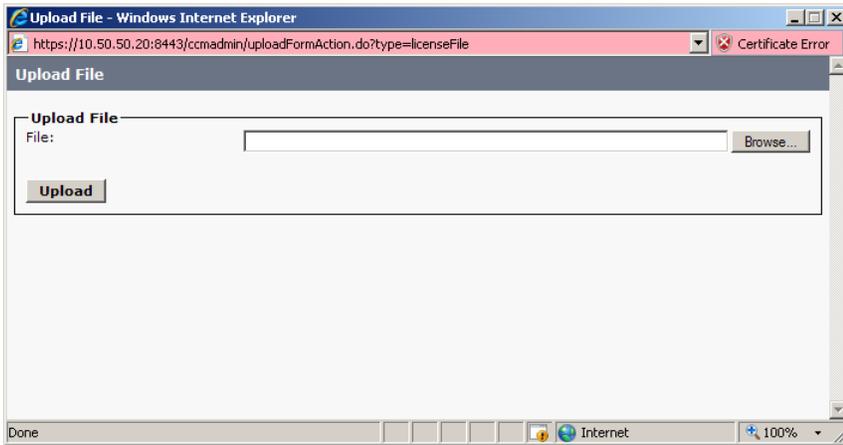
Using a web browser, log into the Cisco Unified CM Administration screen.



From the menu select System | Licensing | License File Upload



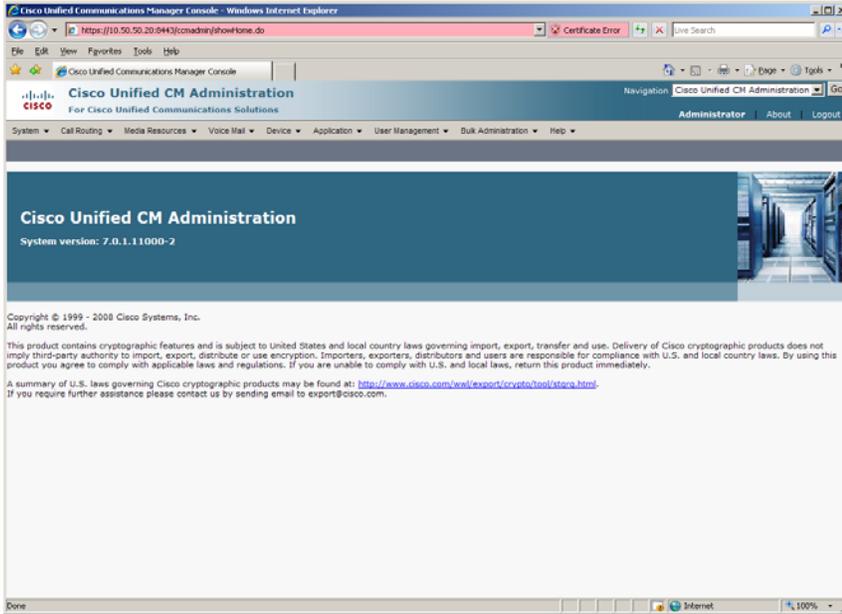
Press Upload License File.



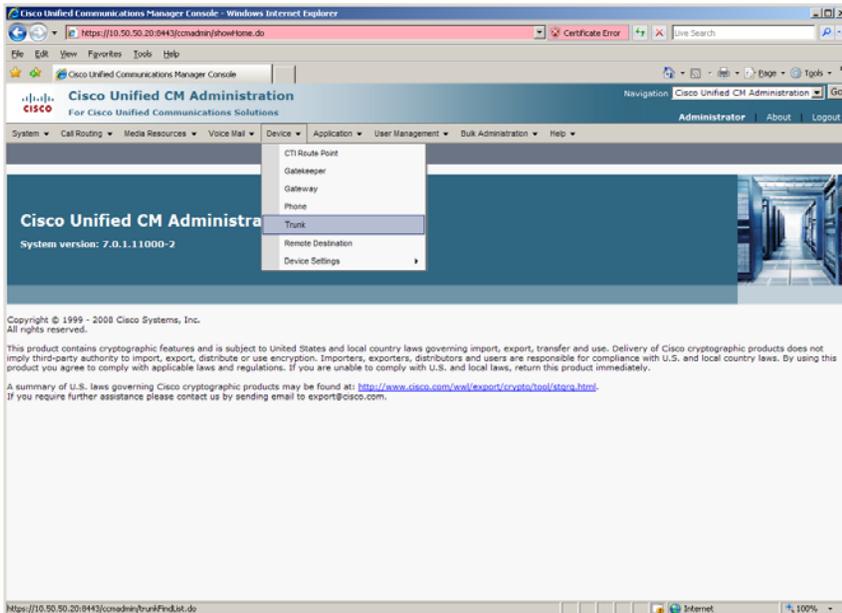
Press Browse and select the License File provide by Cisco. Then press Upload.

4.9.3 Configure SR140 Trunk

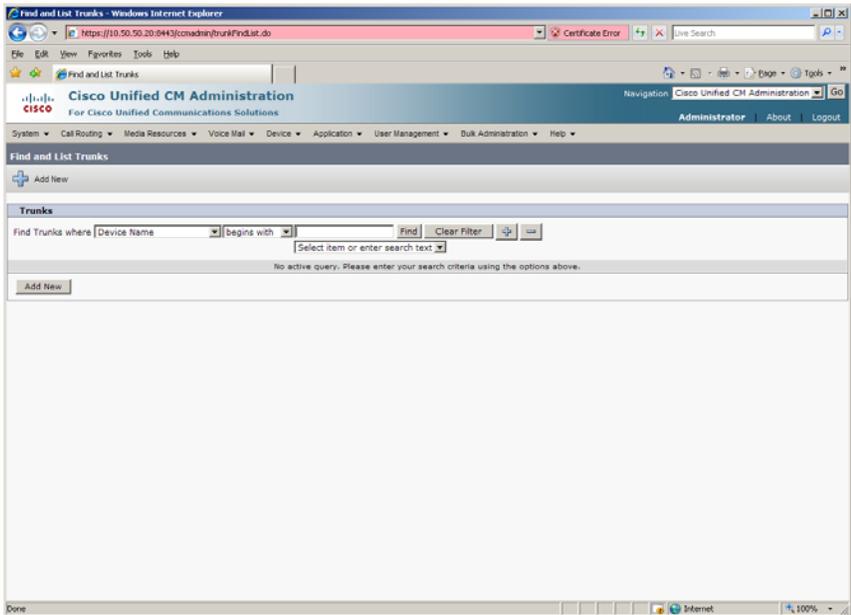
Using a web browser, log into the Cisco Unified CM Administration screen.



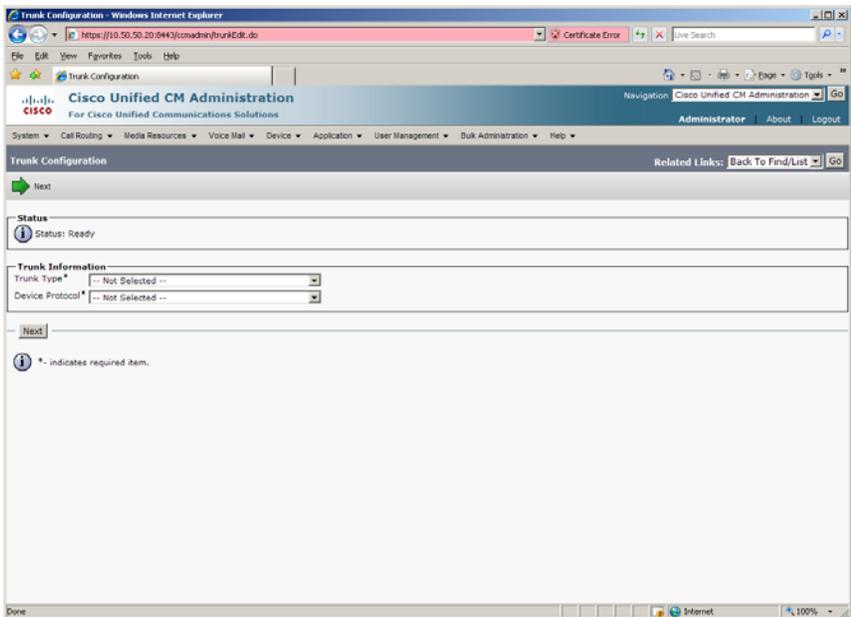
From the menu select Device | Trunk.



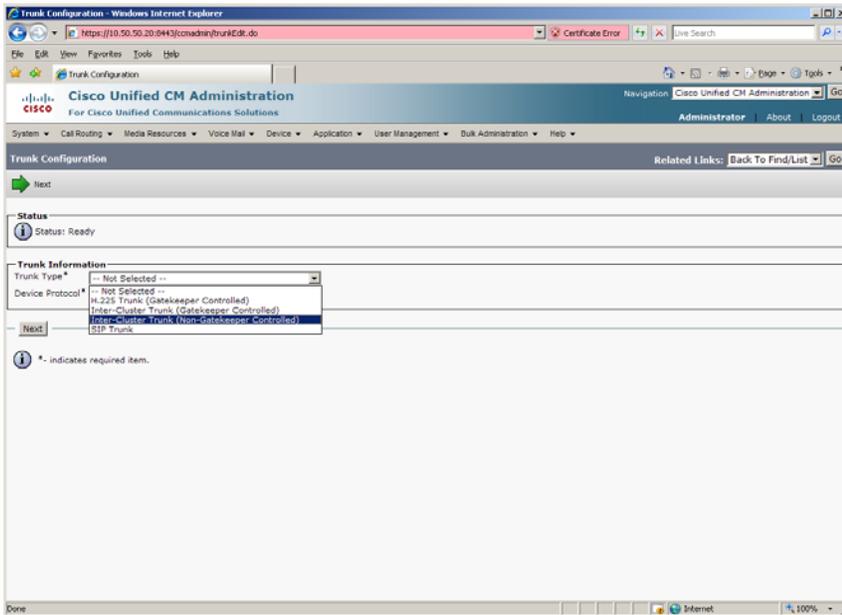
The following screen will appear.



Press Add New to add a new H.323 Trunk.



Select Inter-Cluster Trunk (Non-Gatekeeper Controlled) for the Trunk Type.

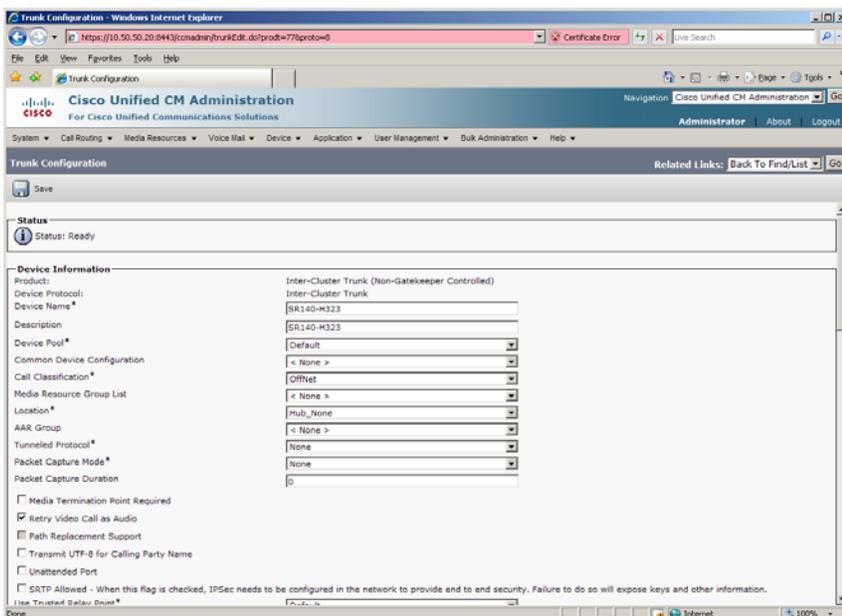


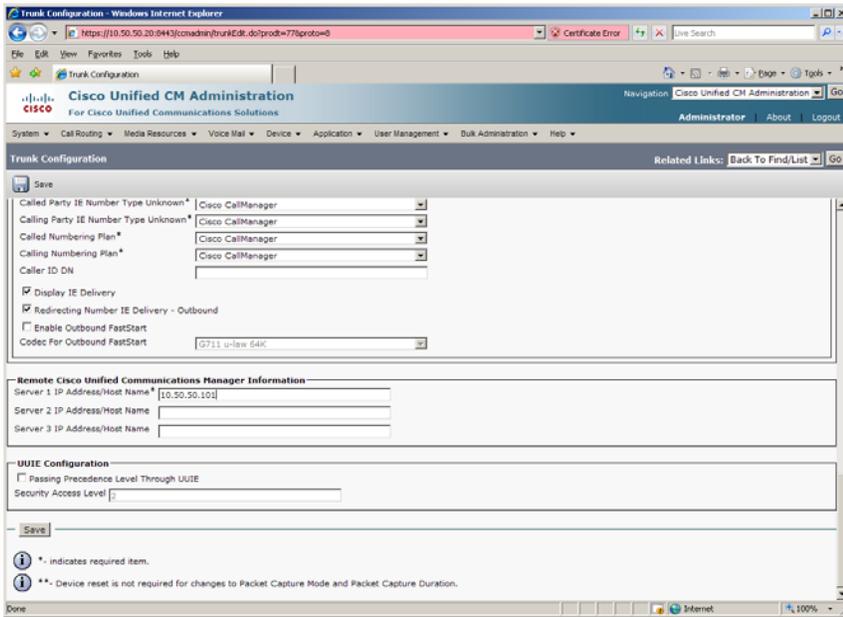
Select Inter-Cluster Trunk for the Device Protocol and press Next.

Set the following:

- Device Name: SR140-H323
- Device Description: SR140-H323
- Device Pool: Default
- Call Classification: OffNet
- Server 1 IP Address/Host Name: 10.50.50.101

Note: Server 1 IP Address/Host Name is the IP address of the SR140.

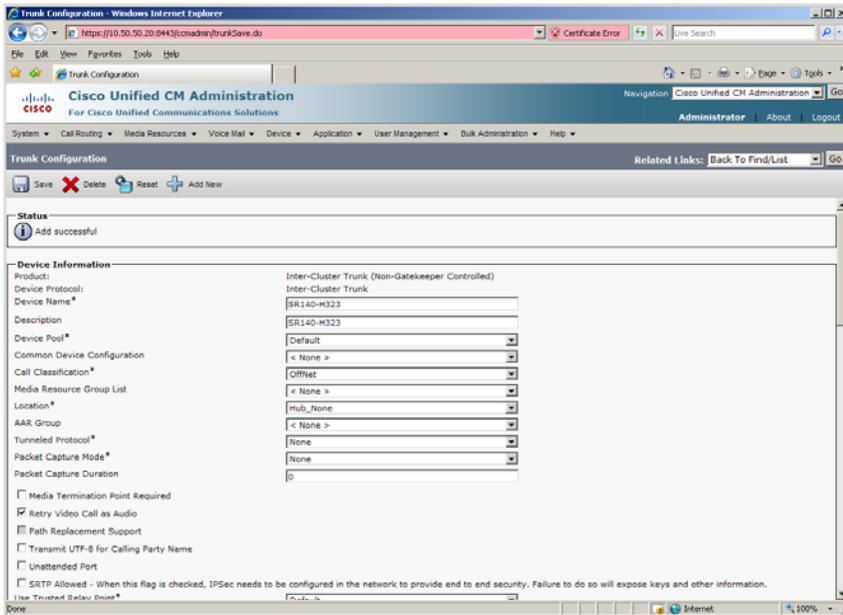




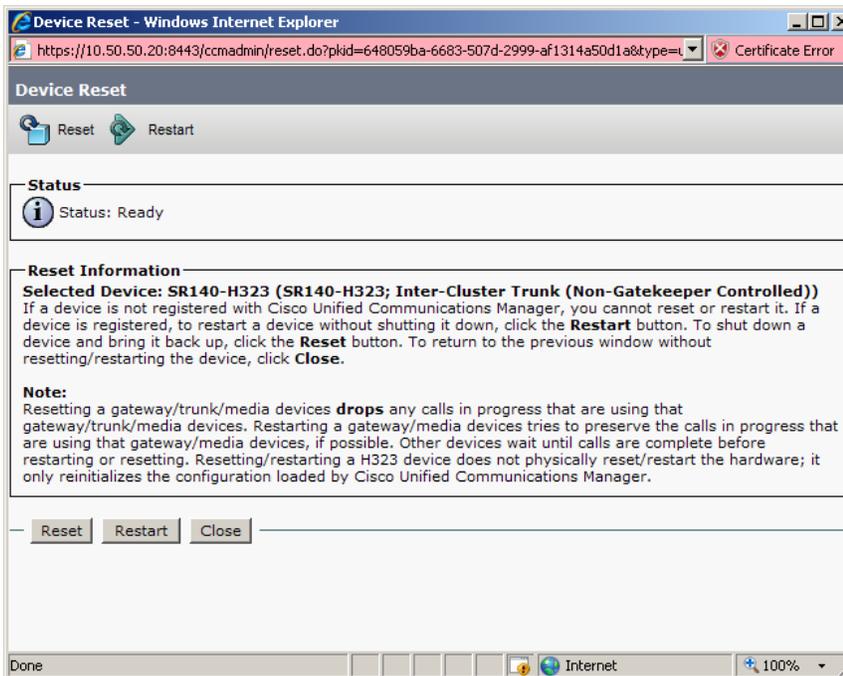
Press Save



Press OK



Press Reset

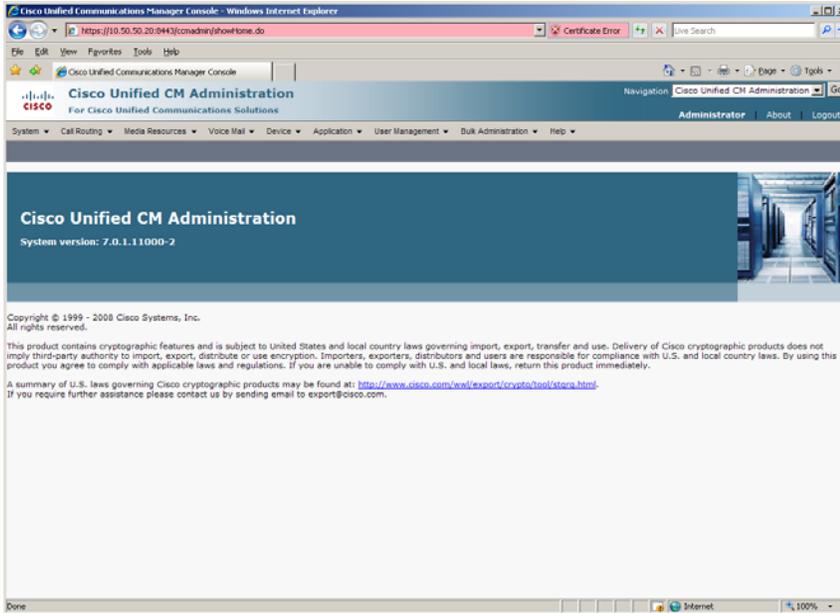


Press Restart then press Close.

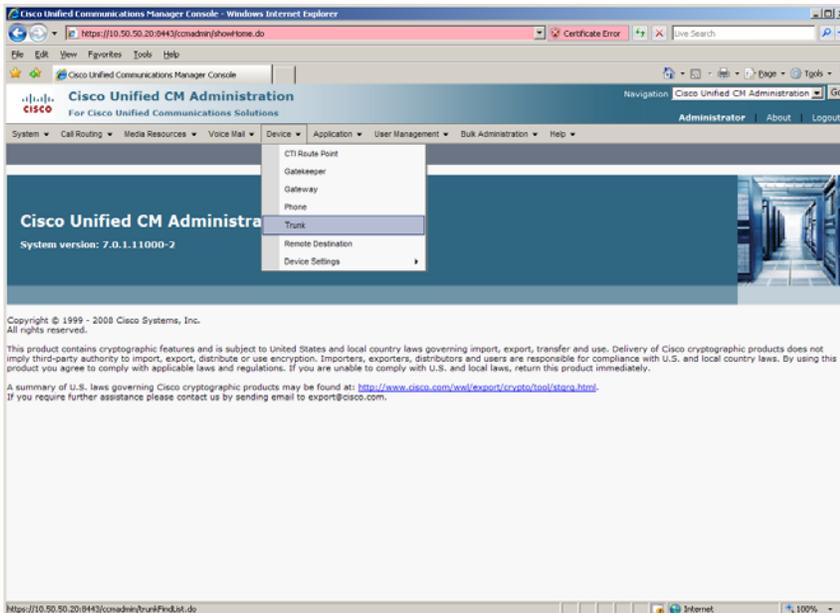
4.9.4 Configure H.323 Gateway Trunk

The following section describes how to add a gateway to the call manager as an H.323 trunk. If you have already added an H.323 trunk or H.323 gateway to your call manager, you may skip this section.

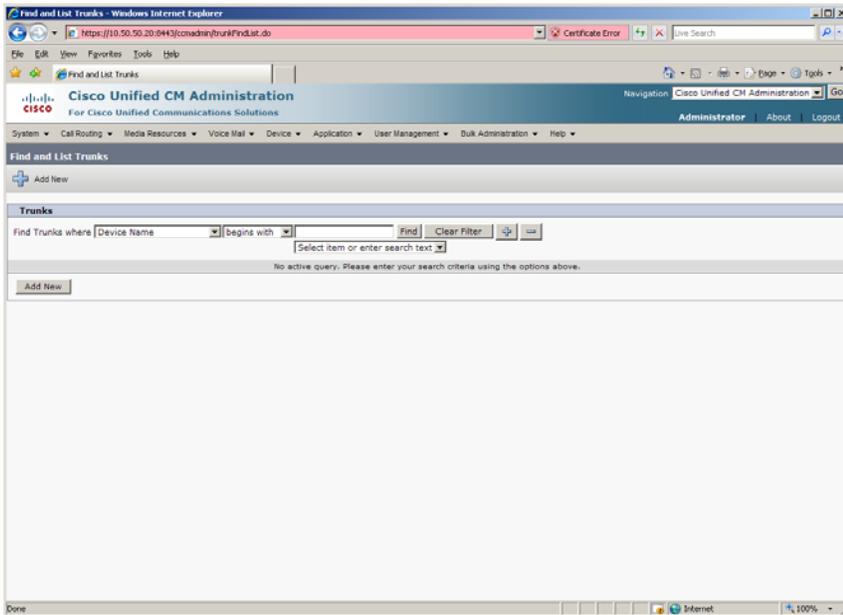
Using a web browser, log into the Cisco Unified CM Administration screen.



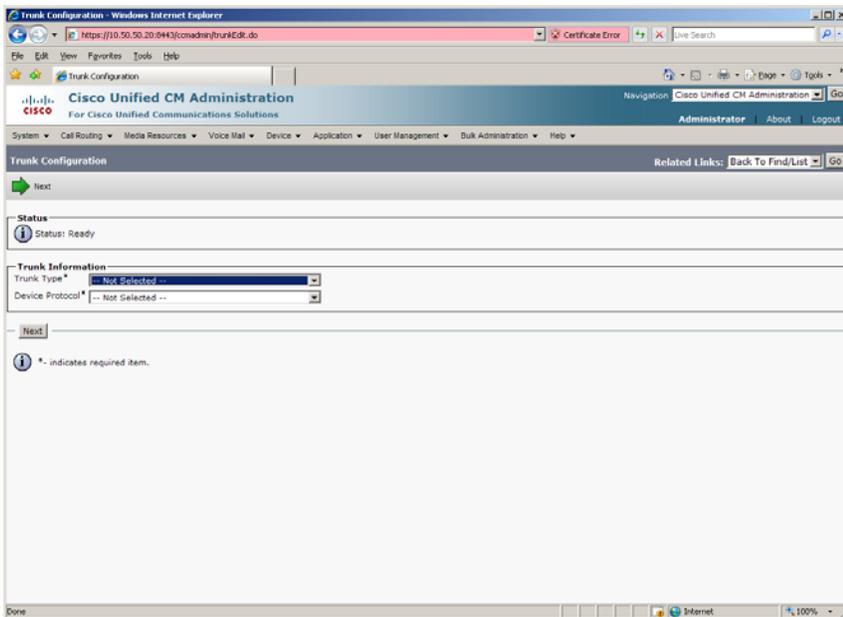
From the menu select Device | Trunk.



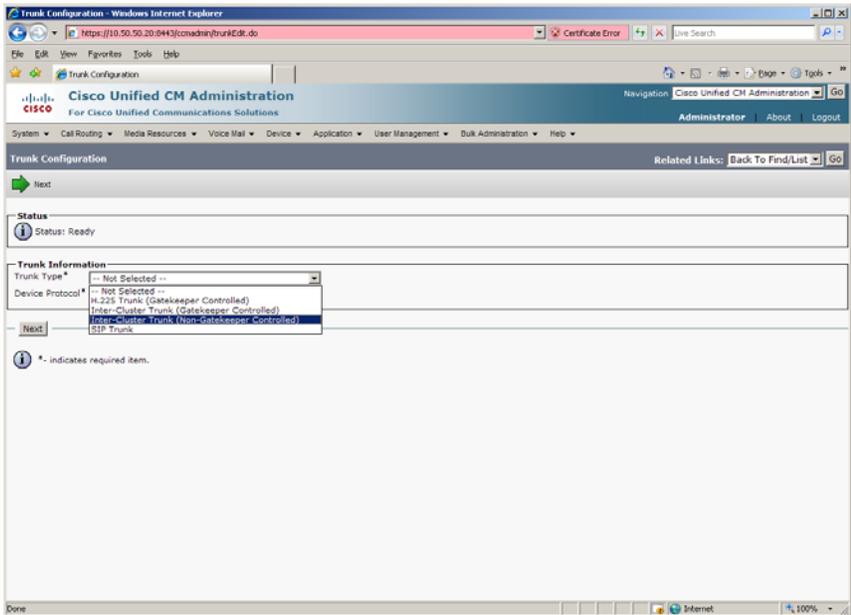
The following screen will appear.



Press Add New to add a new H.323 Trunk.



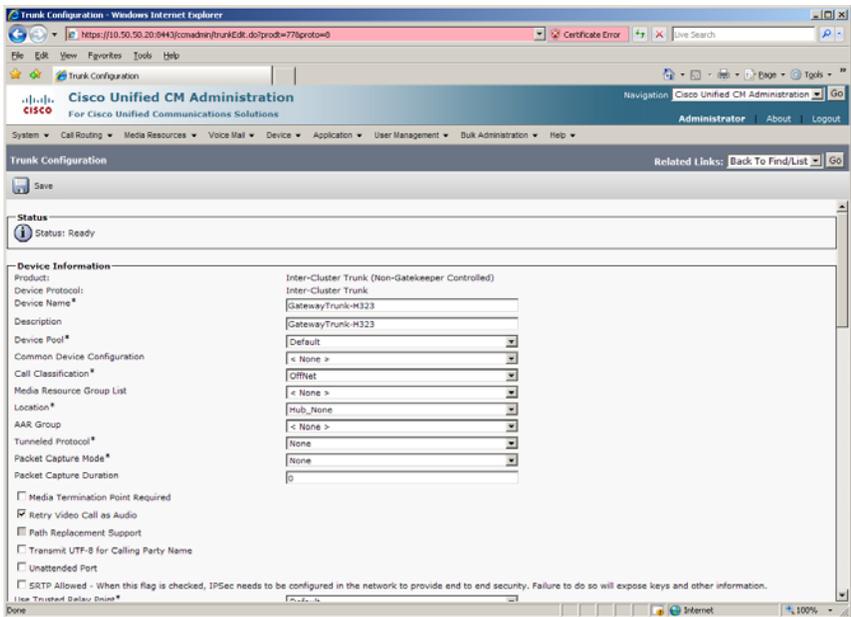
Select Inter-Cluster Trunk (Non-Gatekeeper Controlled) for the Trunk Type.

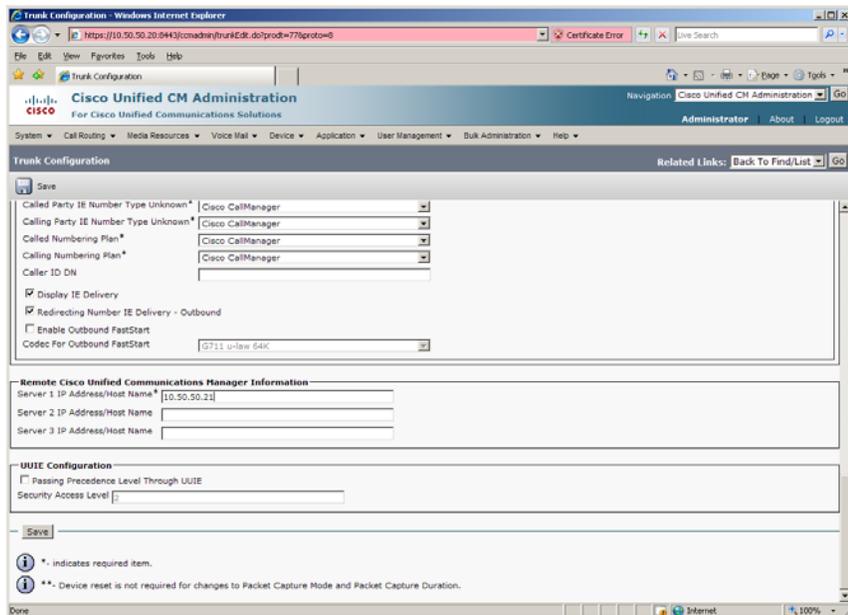


Select Inter-Cluster Trunk for the Device Protocol and press Next.
Set the following:

- Device Name: GatewayTrunk-H323
- Device Description: GatewayTrunk-H323
- Device Pool: Default
- Call Classification: OffNet
- Server 1 IP Address/Host Name: 10.50.50.21

Note: Server 1 IP Address/Host Name is the IP address of the Gateway.

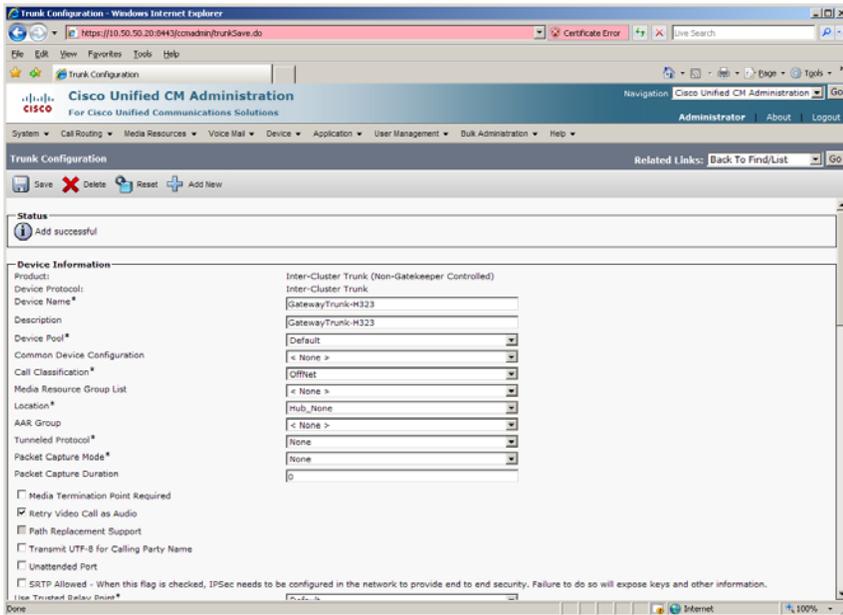




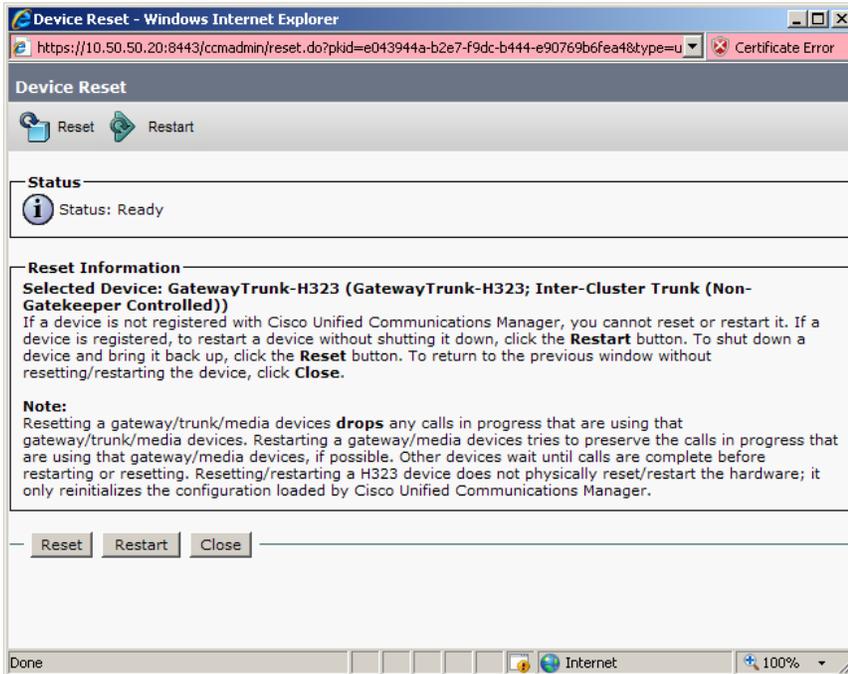
Press Save



Press OK



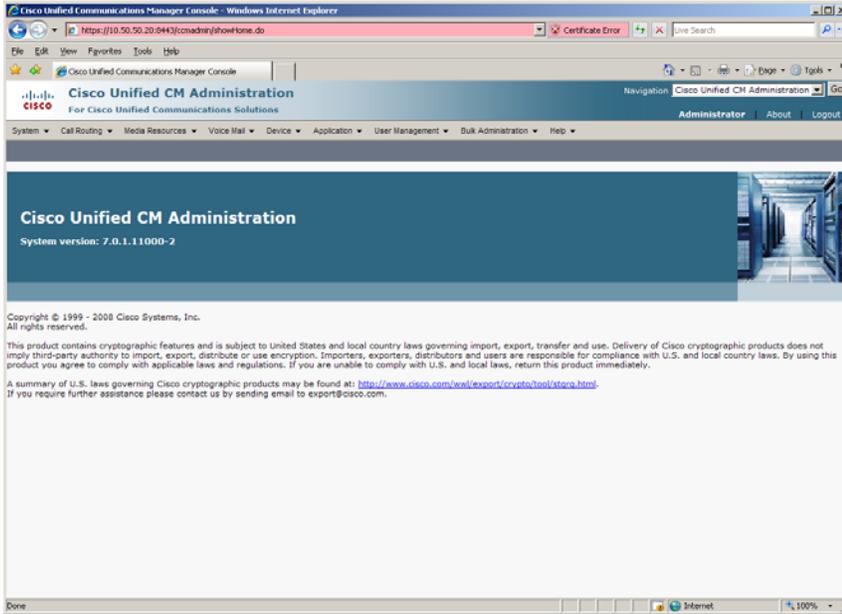
Press Reset



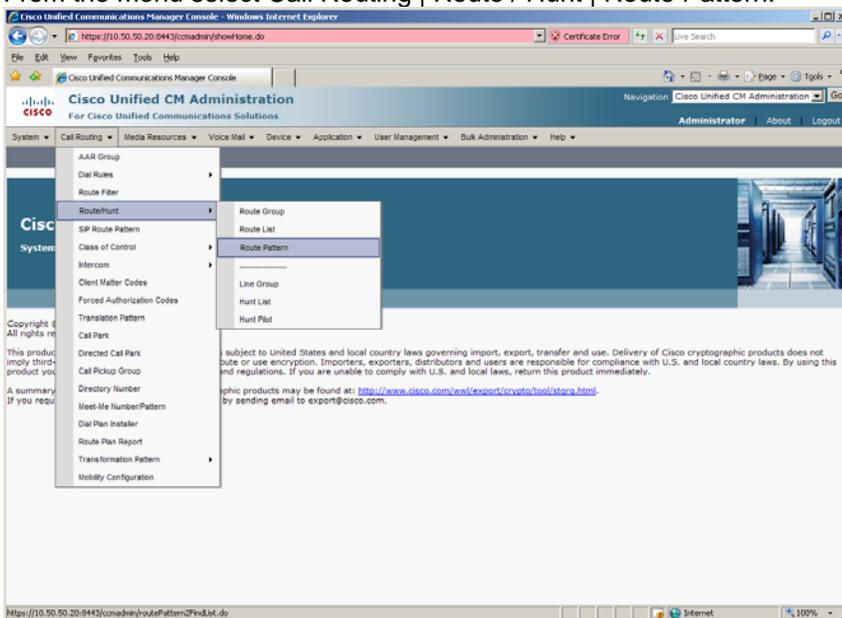
Press Restart then press Close

4.9.5 Configure Call Routing

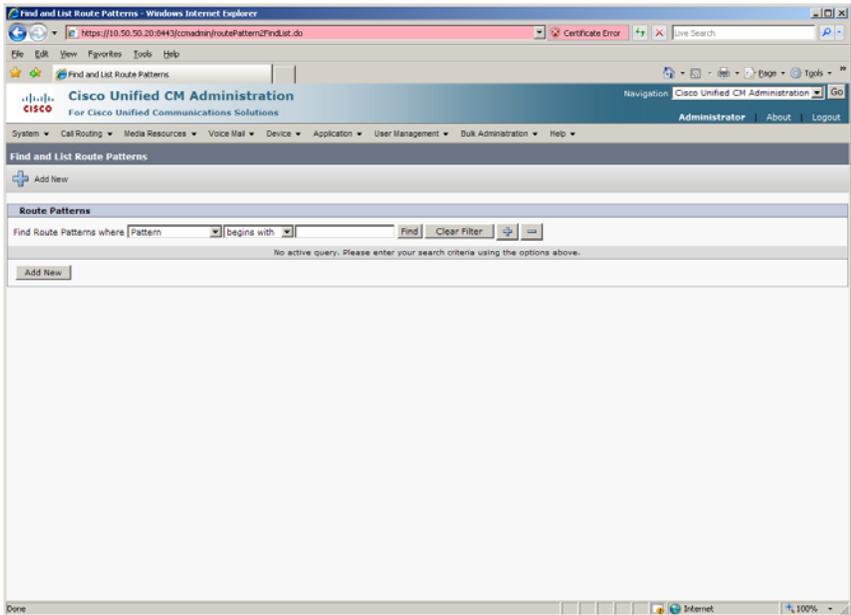
Using a web browser, log into the Cisco Unified CM Administration screen.



From the menu select Call Routing | Route / Hunt | Route Pattern.

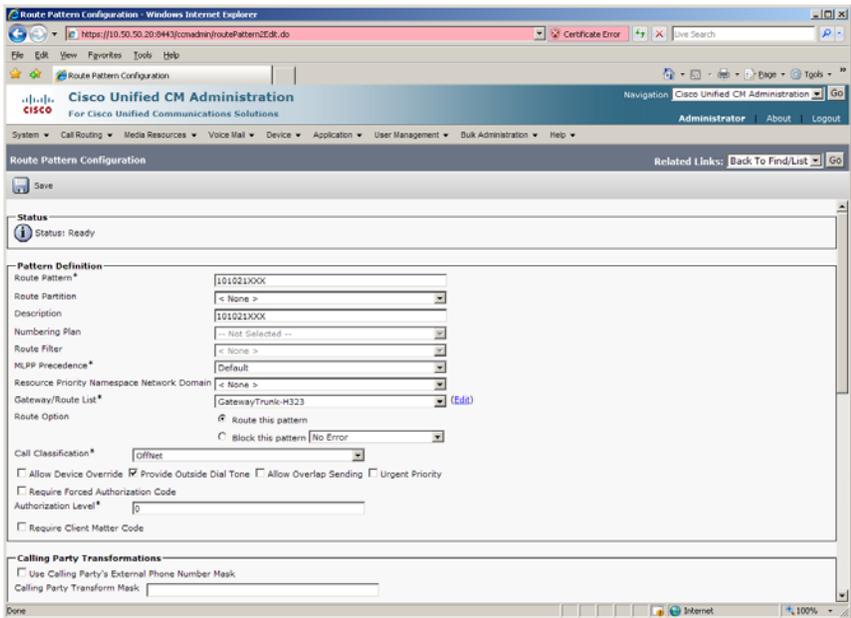


The following screen will appear.



Press Add New
Set the following:

- Route Pattern: 101021XXX
- Description: 101021XXX
- Gateway/Route List: GatewayTrunk-H323
- Call Classification: OffNet



Press Save. The following appears because you did not require a Forced Authorization Code.



Press OK.



Press OK.

Repeat the same steps and set the following to route to the SR140:

- Route Pattern: 101101XXX
- Description: 101101XXX
- Gateway/Route List: SR140-H323
- Call Classification: OffNet

5 H.323 / MGCP Configuration Details

5.1 Cisco Unified Communication Manager 7.0 – H.323 / MGCP Configuration

Vendor	Cisco
Model	Cisco Unified Communication Manager
Software Version	7.0.1.11000-2
Protocol to SR140	H.323
Protocol to Gateway	MGCP

5.2 Cisco 2800 Gateway

Vendor	Cisco
Model	Cisco 2800 Integrated Service Router
Software Version	Cisco IOS Software, 2800 Software (C2800NM-SPSERVICESK9-M), Version 12.4(3i), RELEASE SOFTWARE (fc2)
PSTN Device	Dialogic® Brooktrout® TR1034 Fax Board
Protocol to PSTN Device	T1 Robbed Bit Signaling with E&M Wink Start signal protocol
IP Device	Dialogic® Brooktrout® SR140 Fax Software and Cisco CUCM 7.0
Protocol to CUCM	MGCP

5.3 Dialogic® Brooktrout® SR140 Fax Software

Vendor	<i>Dialogic</i>
Model	<i>Dialogic® Brooktrout® SR140 Fax Software</i>
Software Version	<i>SDK 5.2.7 SDK 6.0.2 SDK 6.1.0</i>
Protocol to CUCM	<i>H.323</i>
callctrl.cfg file	<i>SDK 5.2.7 – All defaults except set h323_H245Stage = 3 SDK 6.02 – All defaults SDK 6.1.0 –All defaults</i>

5.4 Dialogic® Brooktrout® TR1034 Fax Board

Vendor	<i>Dialogic</i>
PSTN Device	<i>Dialogic® Brooktrout® TR1034 Fax Board</i>
Software Version	<i>SDK 5.2.7 SDK 6.0.2 SDK 6.1.0</i>
Protocol to GW	<i>T1 Robbed Bit Signaling with E&M Wink Start signal protocol</i>
callctrl.cfg file	<i>All defaults</i>

5.5 Network System Configuration – H.323 / MGCP Configuration

The diagram below details the sample configuration used in connection with the H.323 / MGCP Configuration.

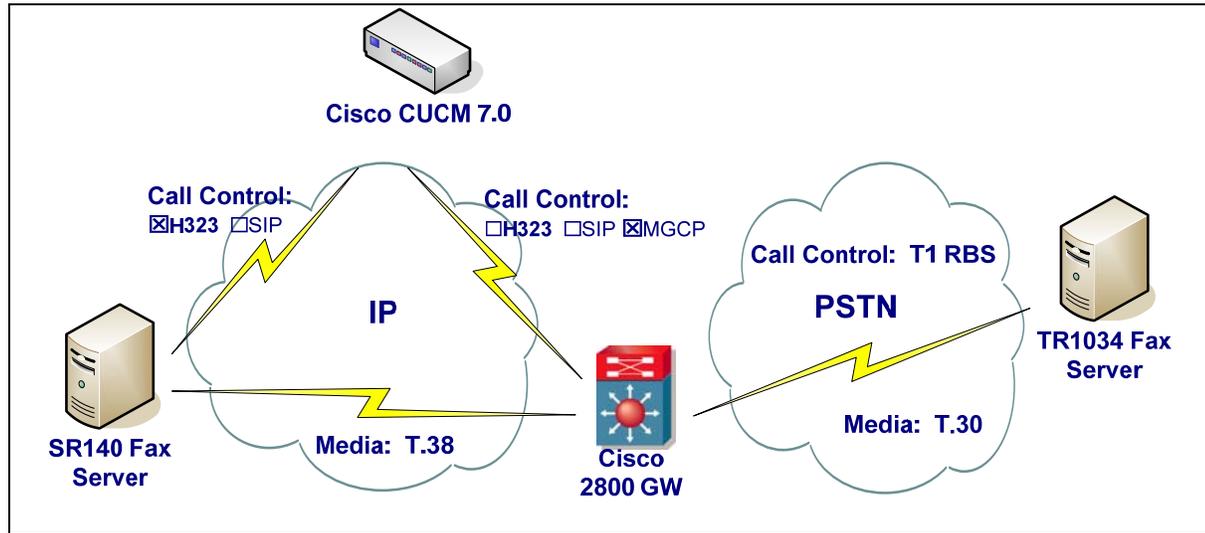


Diagram Notes:

- SR140 Fax Server = Fax Server including Dialogic® Brooktrout® SR140 Fax Software and third party fax application
- TR1034 Fax Server = Fax Server including Dialogic® Brooktrout® TR1034 Fax Board and third party fax application

5.5.1 Network Addresses

Device #	Device Make, Model, and Description	Device IP Address
1	Dialogic® Brooktrout® SR140	10.50.50.101
2	Cisco Unified Communication Manager 7.0	10.50.50.20
3	Cisco 2800 Integrated Service Router	10.50.50.21

5.5.2 Dialing Plan Overview

To call the SR140 from a POTS phone, dial 101101xxx, where x is a number between 0 and 9.

```
POTS(dial 101101xxx)—T1 RBS—>  
Gateway(dial 101101xxx@10.50.50.20)—MGCP—>  
CUCM7.0(dial 101101xxx@10.50.50.101)—H.323—>SR140
```

To call the POTS lines of the Gateway, dial 301021xxx@10.50.50.20, where x is a number between 0 and 9, from the SR140.

```
SR140(dial 301021xxx@10.50.50.20)—H.323—>  
CUCM7.0(dial 301021xxx@10.50.50.21)—MGCP—>  
Gateway(dial 301021xxx)—T1 RBS—>POTS
```

5.6 Dialogic® Brooktrout® SR140 Fax Software Setup Notes

For the sample test configuration using SDK 6.0 and later, the SR140 was configured using the default values.

For previous SDKs, the following parameter in the callctrl.cfg file must be set to 3: h323_H245Stage = 3

The callctrl.cfg file can be modified via the GUI Brooktrout Configuration Tool. The parameter h323_H245Stage can be found when you launch this tool in Advanced Mode for H323. Consult the Dialogic® Brooktrout® Fax Products Installation and Configuration Guide for details.

The Installation and Configuration Guides for SDK 5.2.x, SDK 6.0.x and SDK 6.1.x are available from the site:

<http://www.dialogic.com/manuals/brooktrout/default.htm>

Note: DHCP cannot be used.

5.7 Dialogic® Brooktrout® TR1034 Fax PSTN Setup Notes

For the sample test configuration, the TR1034 was configured using the default values, consult the Dialogic® Brooktrout® Fax Products Installation and Configuration Guide for details.

5.8 Cisco 2800 Gateway Setup Notes

For the sample test configuration, the Cisco 2800 Gateway was configured the Cisco IOS Command-Line Interface. The specific items configured include:

- Configure line card interface
- Configure MGCP
- Configure Dial-Peers

5.8.1 Configure line card interface

The following lines will allow T1 Robbed Bit Signaling with E&M Wink Start signal protocol.

```
controller T1 0/0/0
    framing esf
    clock source internal
    linecode b8zs
    cablelength short 133
    ds0-group 0 timeslots 1-24 type e&m-wink-start
    description E&M Wink Start T1-RBS
```

Note: the ds0-group line must NOT contain dtmf dnis when doing Wink Start and MGCP.

5.8.2 Configure MGCP

The following will allow MGCP calls.

```
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server 10.50.50.20
!
mgcp
mgcp call-agent 10.50.50.20 2427 service-type mgcp version 0.1
mgcp default-package fxr-package
!
mgcp profile default
```

Note: 10.50.50.20 is the IP address of the CUCM.

Note: Verify that **mgcp fax t38 inhibit** is not present since it disables T.38

5.8.3 Configure Dial-Peers - POTS

With MGCP the dial-peers are configured on CUCM. The POTS port controlled by MGCP must be configured as follows:

```
dial-peer voice 301021000 pots
service mgcpapp
port 0/0/0:0
```

After configuring CUCM verify that the Gateway is registered with the command **sh ccm-manager**.

```
firestar#sh ccm-manager
MGCP Domain Name: firestar.dialogic.com
Priority      Status      Host
```

```
=====
Primary      Registered  10.50.50.20
First Backup  None
Second Backup None
```

```
Current active Call Manager: 10.50.50.20
Backhaul/Redundant link port: 2428
Failover Interval:          30 seconds
```

Keepalive Interval: 15 seconds
Last keepalive sent: 13:41:11 PCTime Apr 16 2009 (elapsed time: 00:00:03)
Last MGCP traffic time: 13:41:11 PCTime Apr 16 2009 (elapsed time: 00:00:03)
Last failover time: None
Last switchback time: None
Switchback mode: Graceful
MGCP Fallback mode: Not Selected
Last MGCP Fallback start time: None
Last MGCP Fallback end time: None
MGCP Download Tones: Disabled

Configuration Error History:
FAX mode: cisco

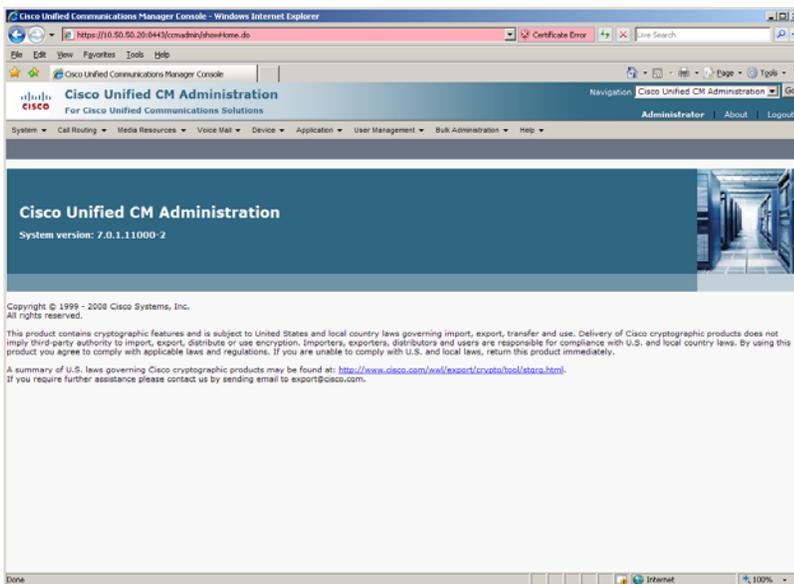
5.9 CUCM 7.0 Setup Notes – H.323 / MGCP Configuration

The CUCM 7.0 configuration values that were used in the sample configuration involve configuring the following items:

- Configure Service Activation – refer to [section 4.9.1](#)
- Configure License – refer to [section 4.9.2](#)
- Configure SR140 Trunk – refer to [section 4.9.3](#)
- Configure Gateway Trunk
- Configure Call Routing

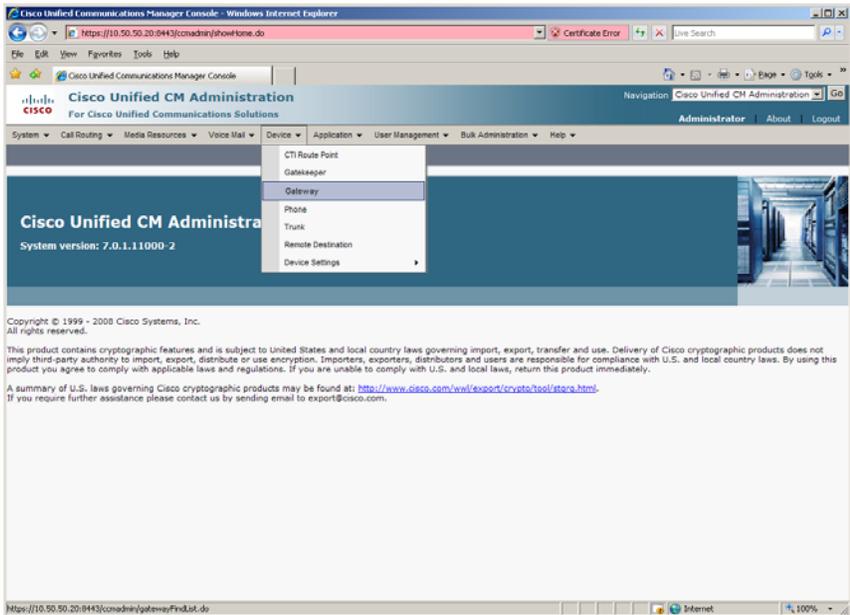
5.9.1 Configure Gateway Trunk

Using a web browser, log into the Cisco Unified CM Administration screen.

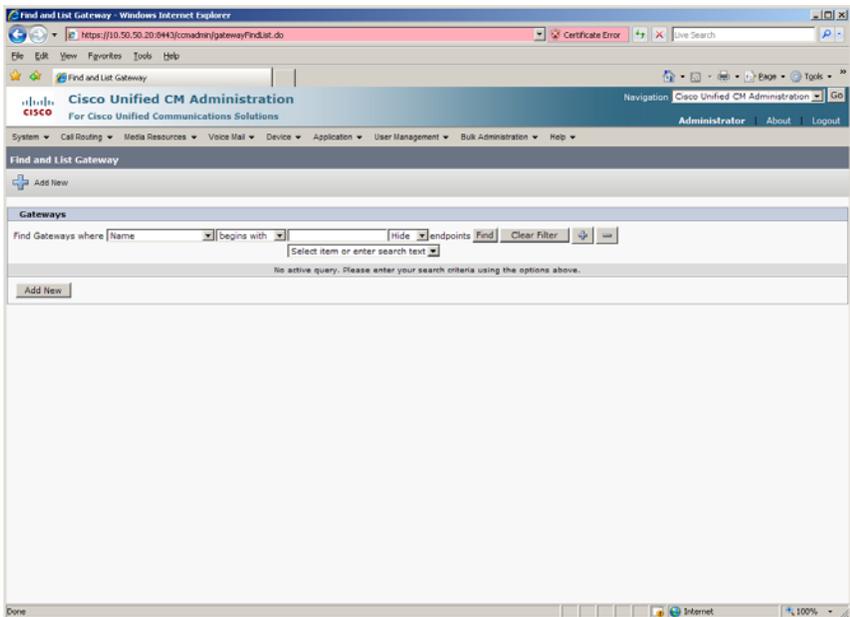


From the menu select Device | Gateway.

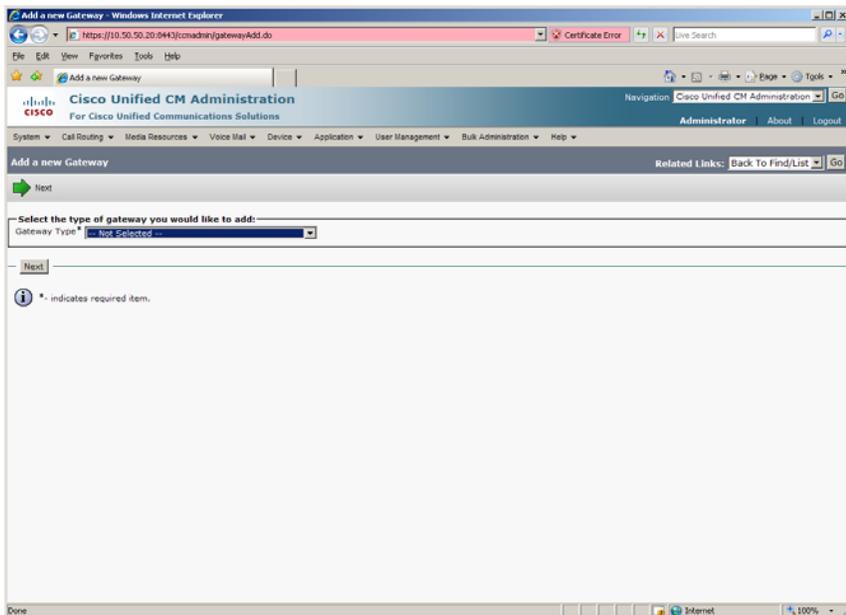
Dialogic® Brooktrout® SR140 Fax Software with Cisco Unified Communications Manager 7.0
Installation and Configuration Integration Note



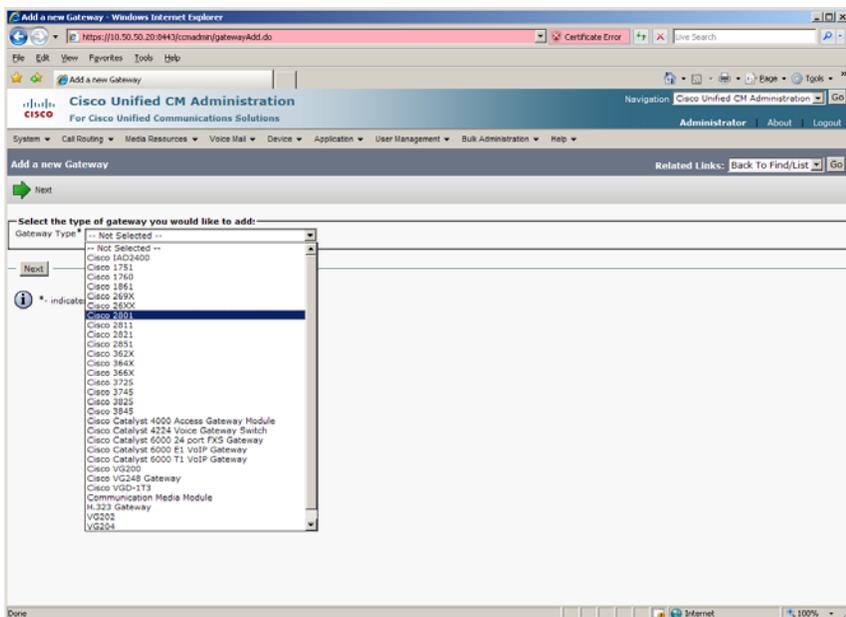
The following screen will appear.



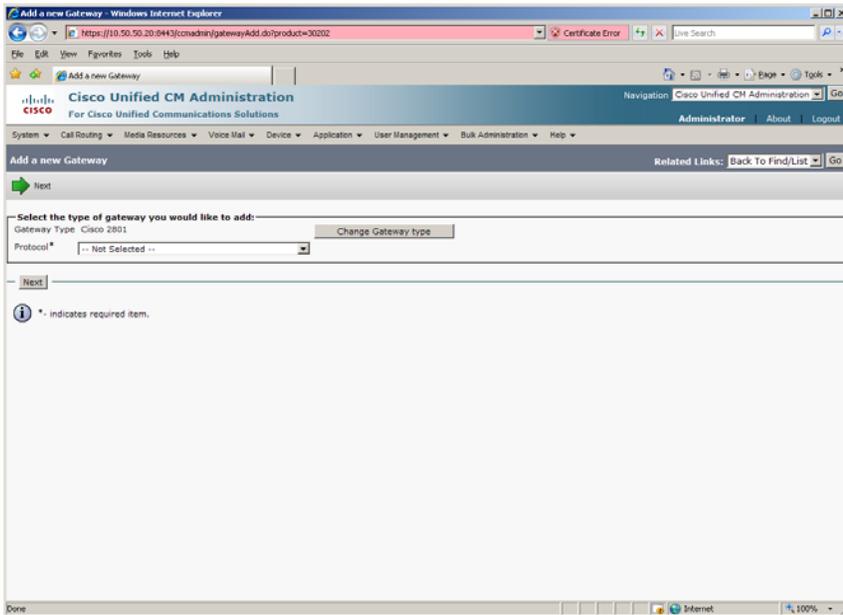
Press Add New to add a new MGCP Trunk.



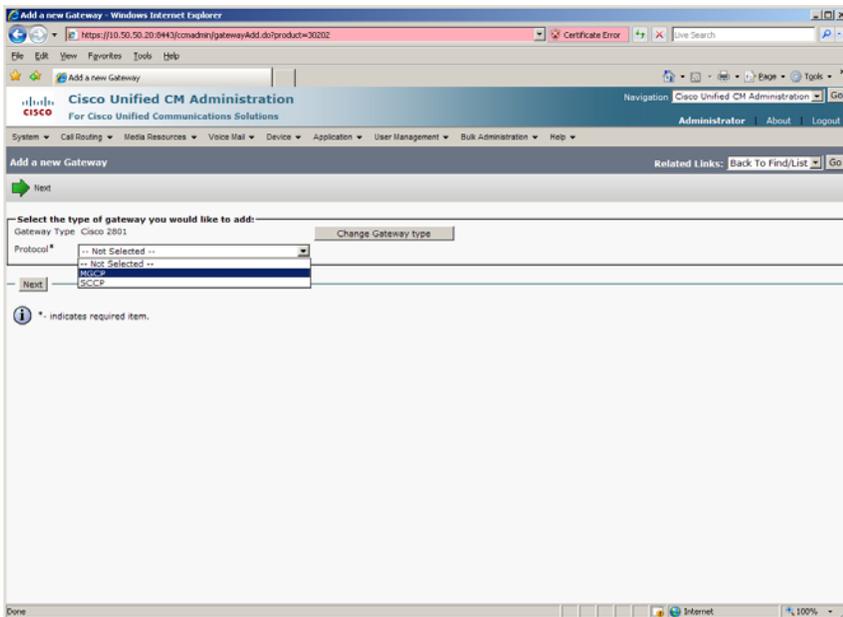
Select Cisco 2801 for the Gateway Type.



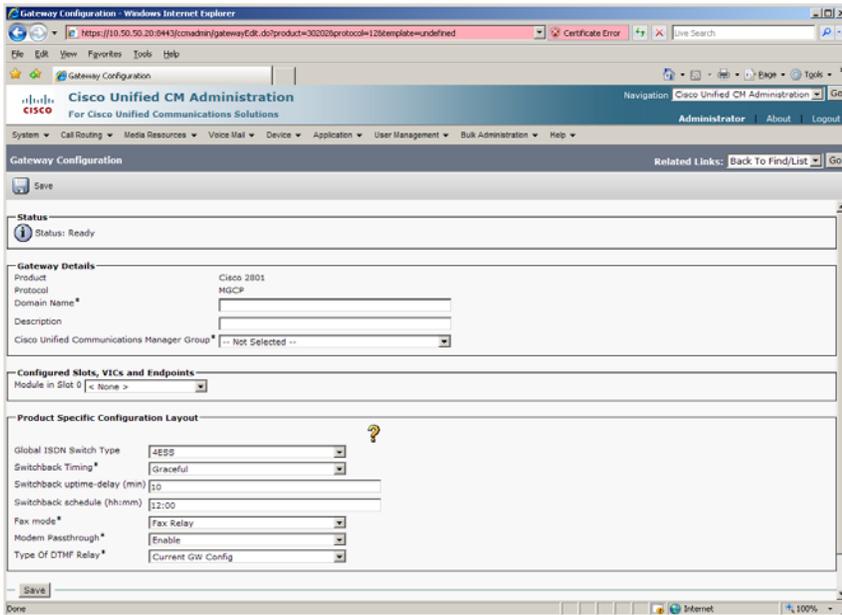
Press Next.



Select MGCP for the Protocol

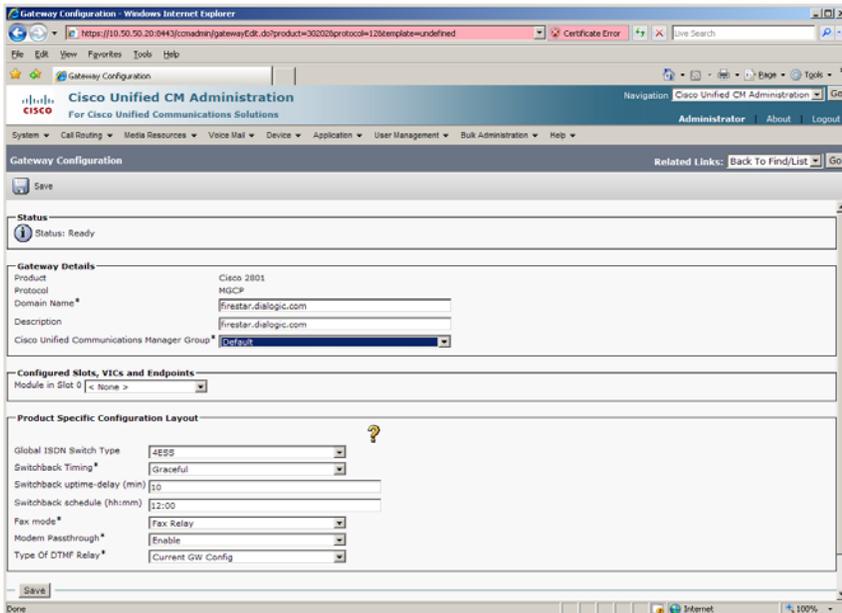


Press Next.



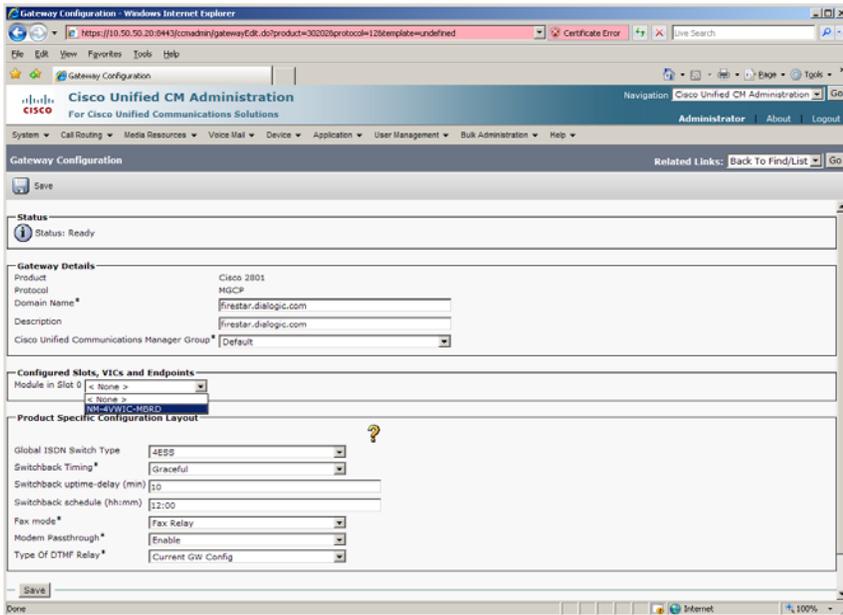
Set the following:

- Domain Name: firestar.dialogic.com
- Description: firestar.dialogic.com
- Cisco Unified Communications Manager Group: Default

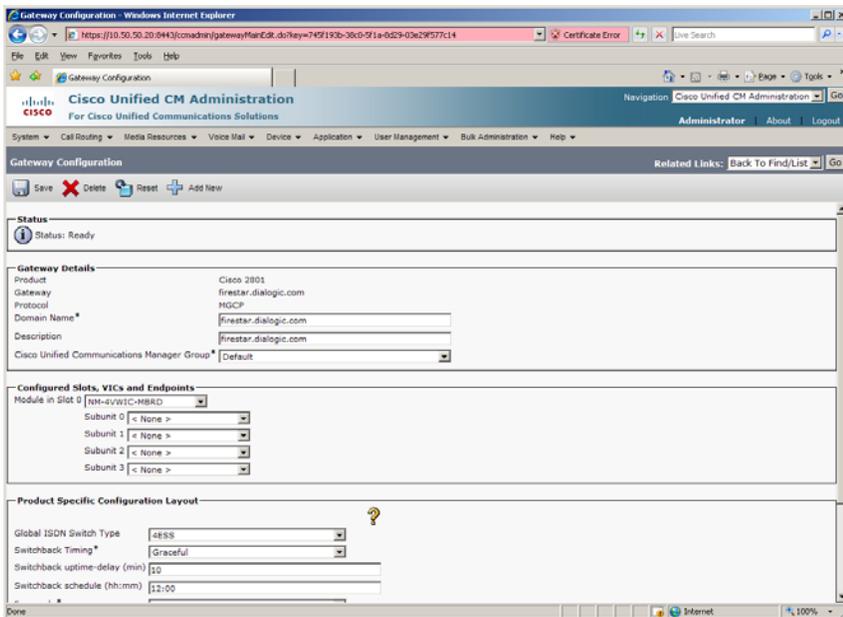


Select NM-4VWIC-MBRD for the Module in Slot 0

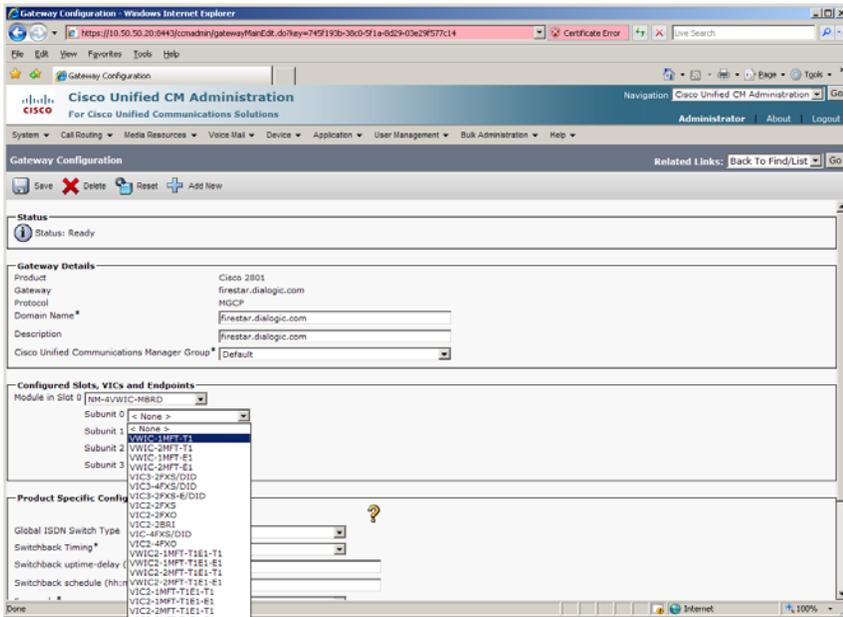
Dialogic® Brooktrout® SR140 Fax Software with Cisco Unified Communications Manager 7.0
Installation and Configuration Integration Note



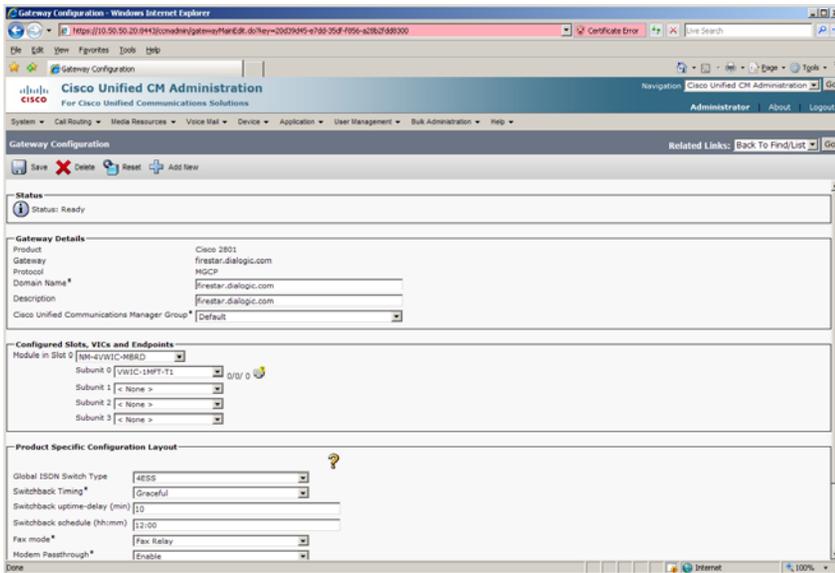
Press Save



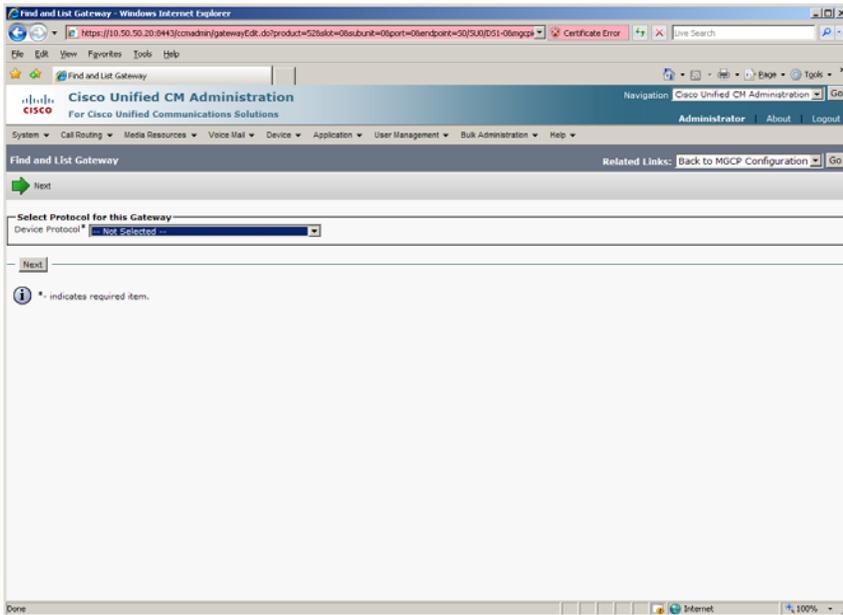
Select VVIC-1MFT-T1 for Subunit 0



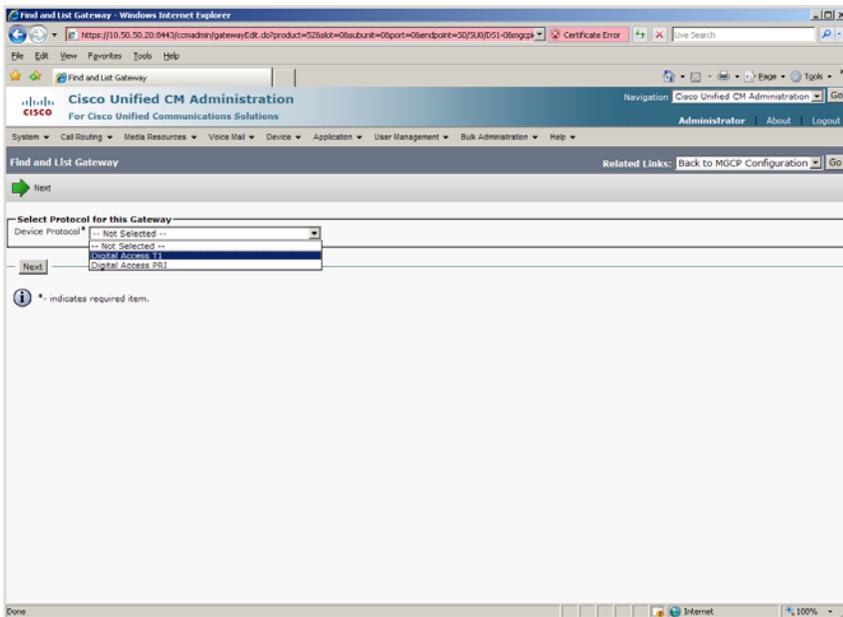
Press Save



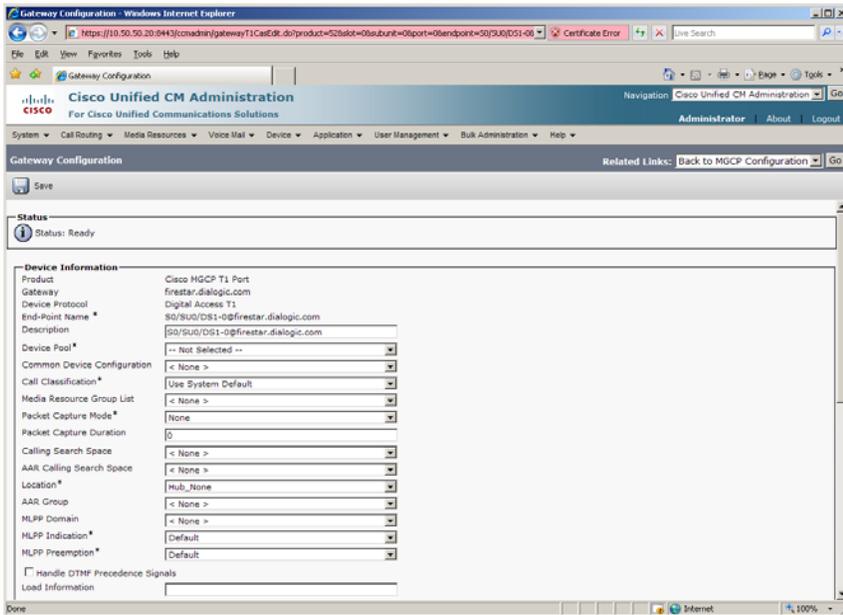
Press the port icon with the question mark next to the Subunit 0.



Select Digital Access T1 for the Device Protocol.

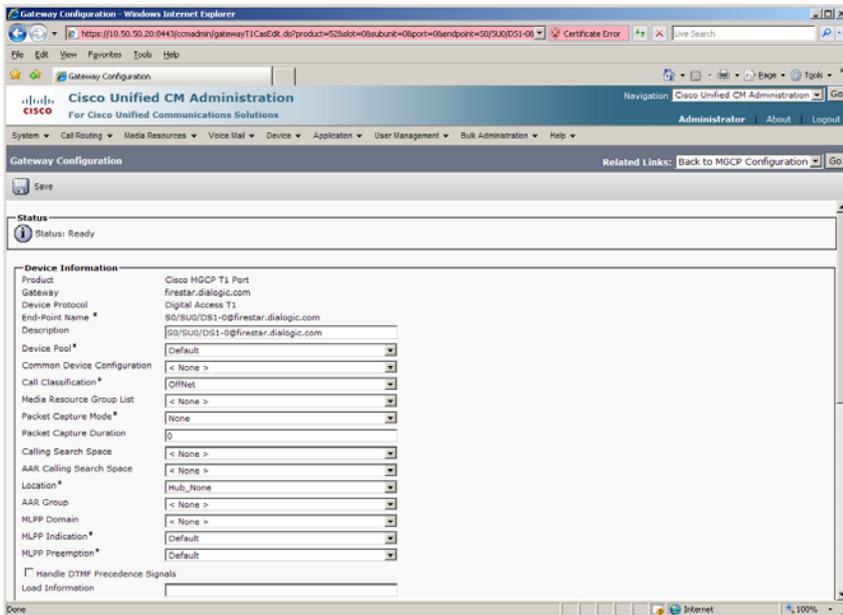


Press Next.



Set the following:

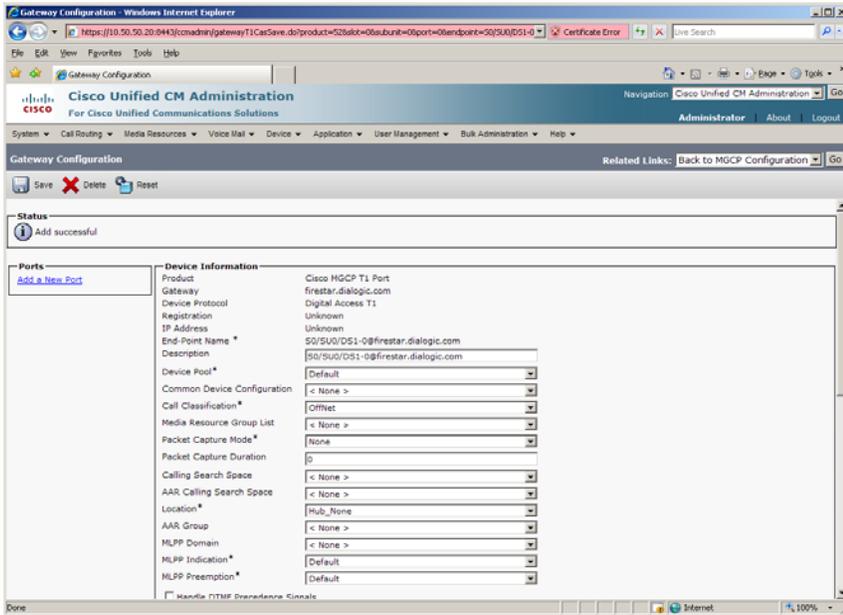
- Device Pool: Default
- Call Classification: OffNet



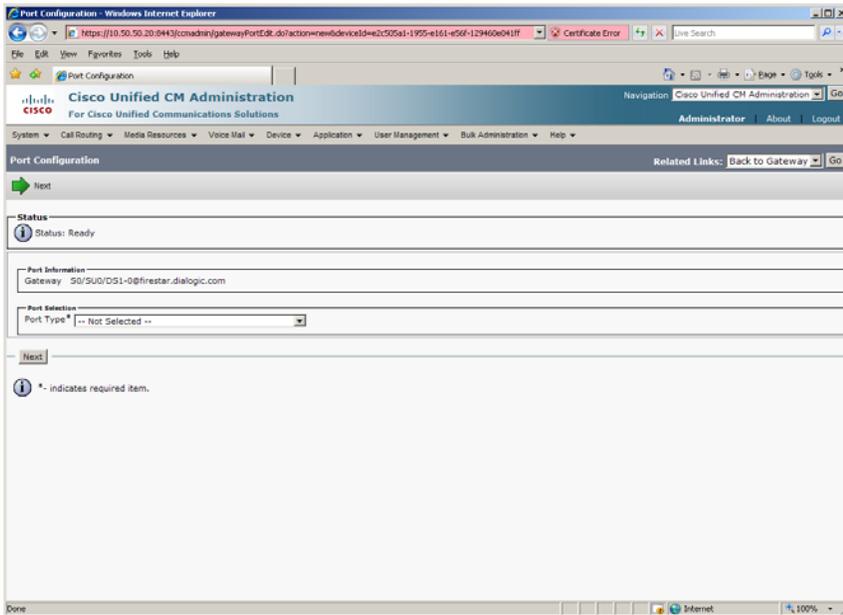
Press Save



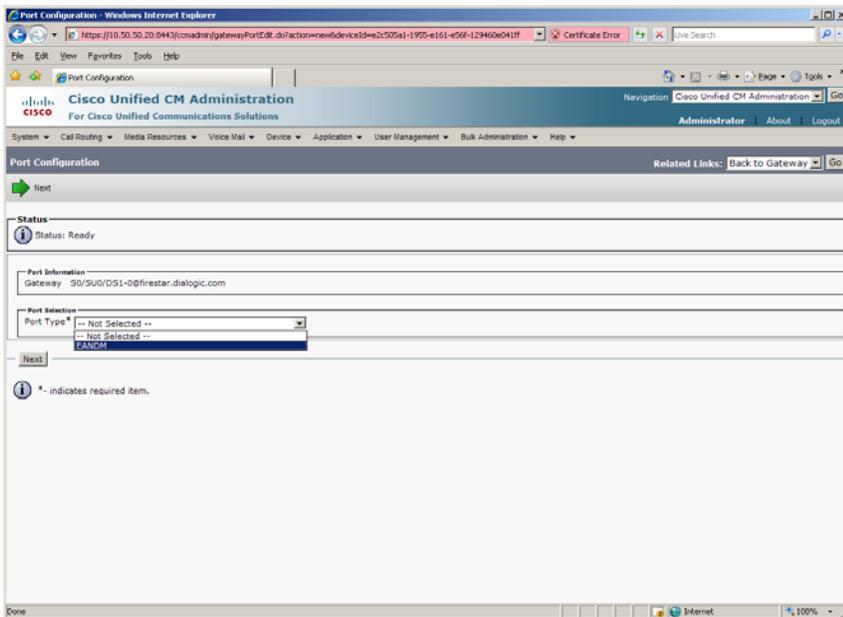
Press OK



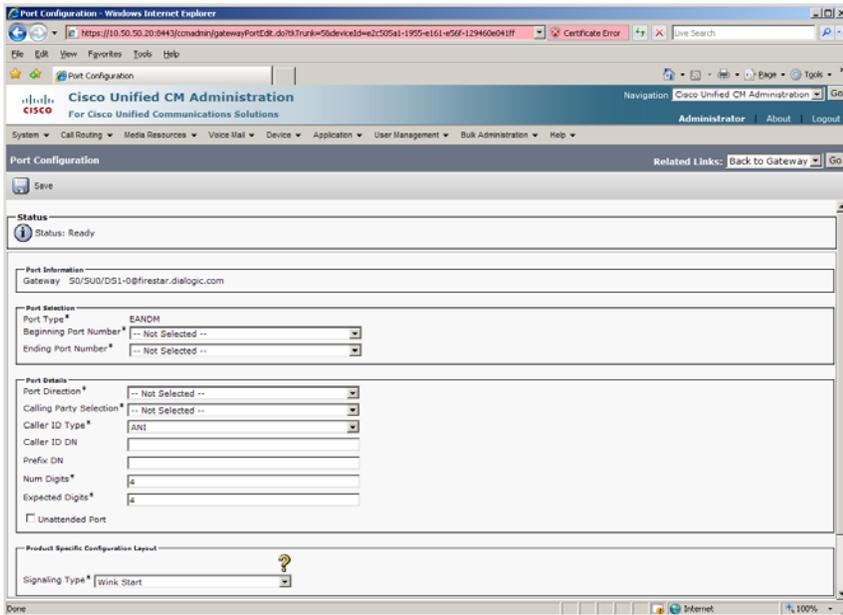
Press Add a New Port on the Ports section



Select EANDM for the Port Type.

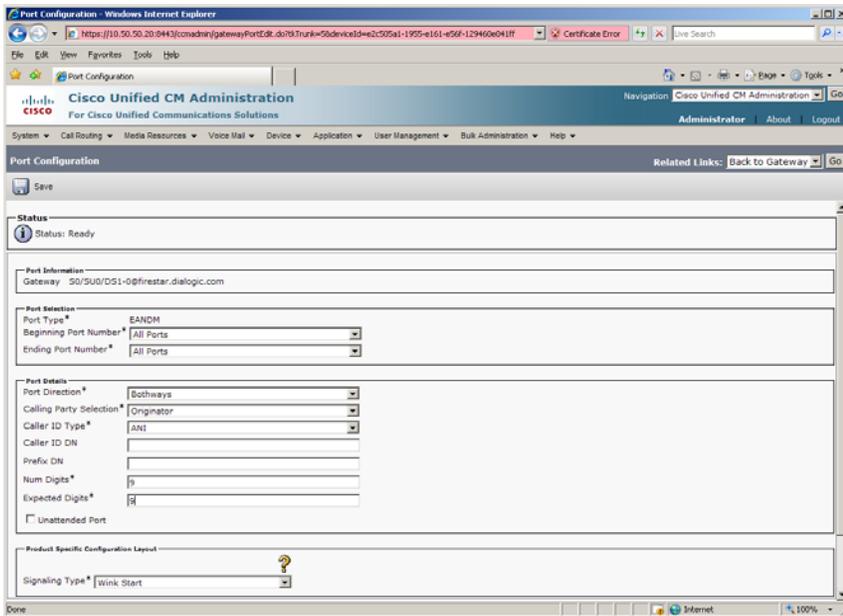


Press Next.



Set the following:

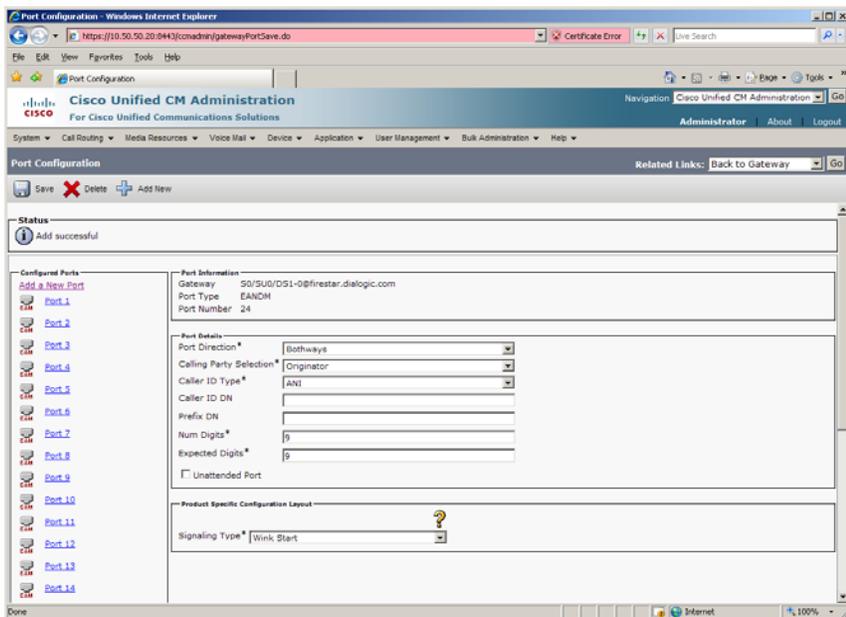
- Beginning Port Number: All Ports
- Ending Port Number: All Ports
- Port Direction: Bothways
- Calling Party Selection: Originator
- Num Digits: 9
- Expected Digits:9



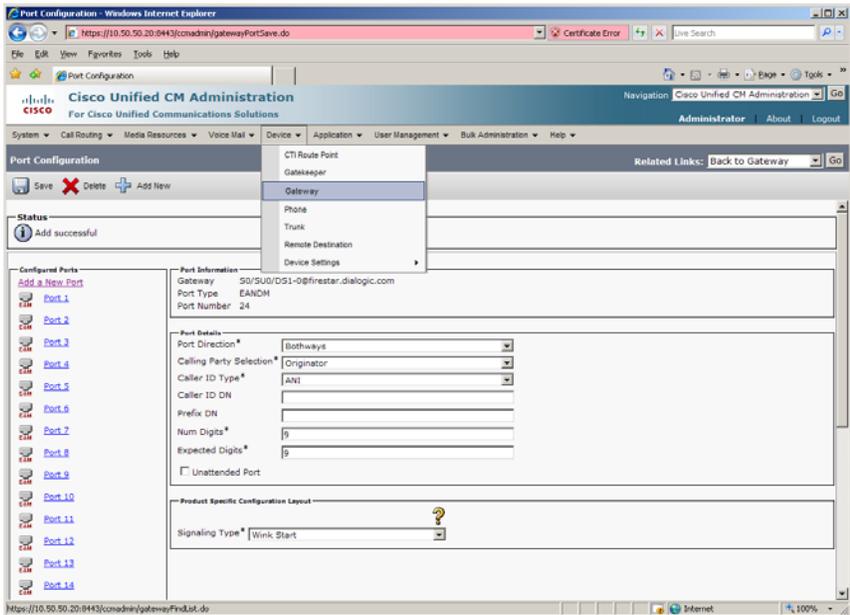
Press Save



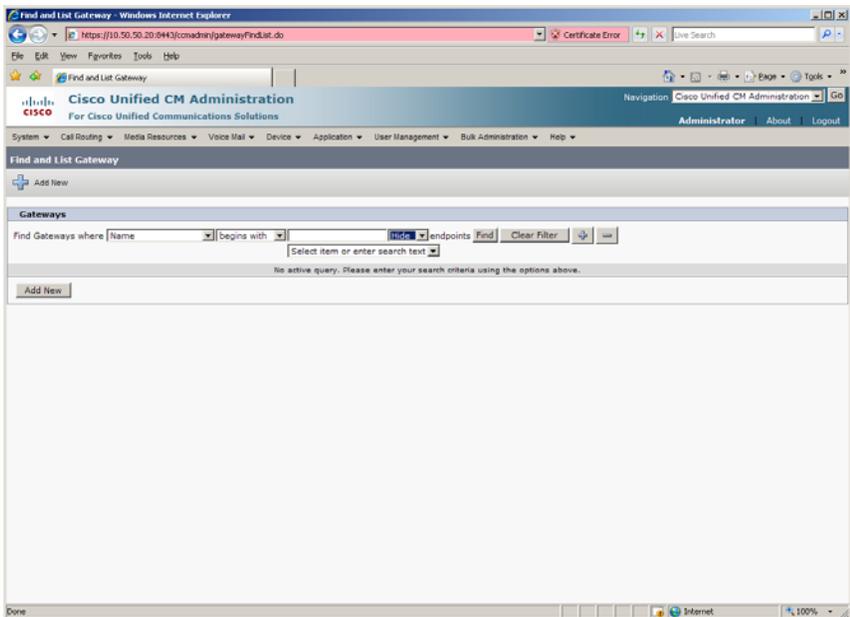
Press OK



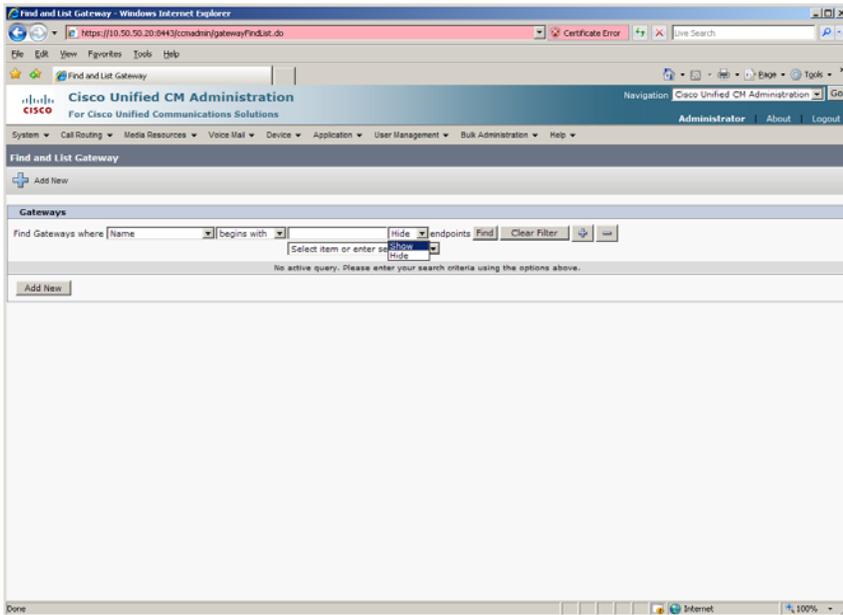
To verify CUCM is registered with the gateway, from the menu select Device | Gateway.



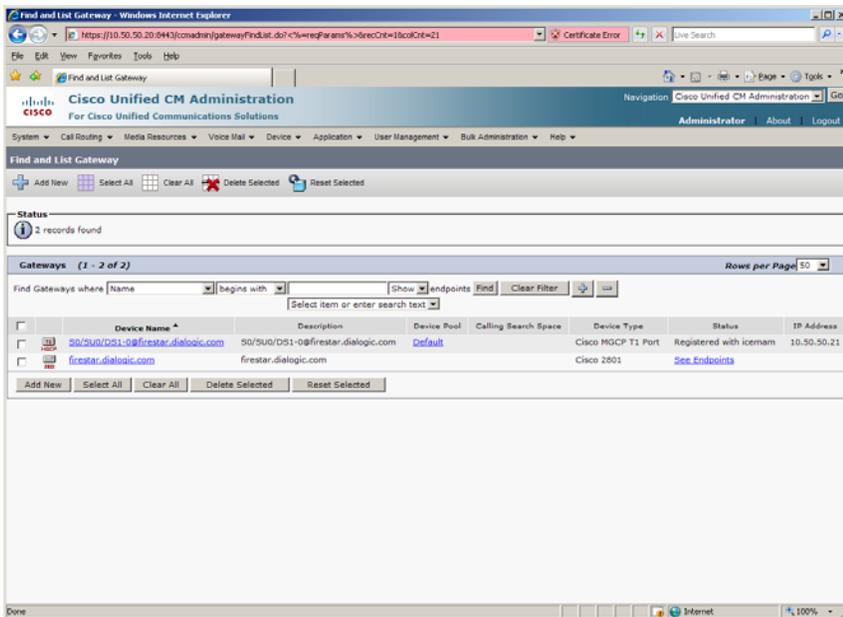
The following screen appears.



Change Hide to Show on the Find Gateways where.



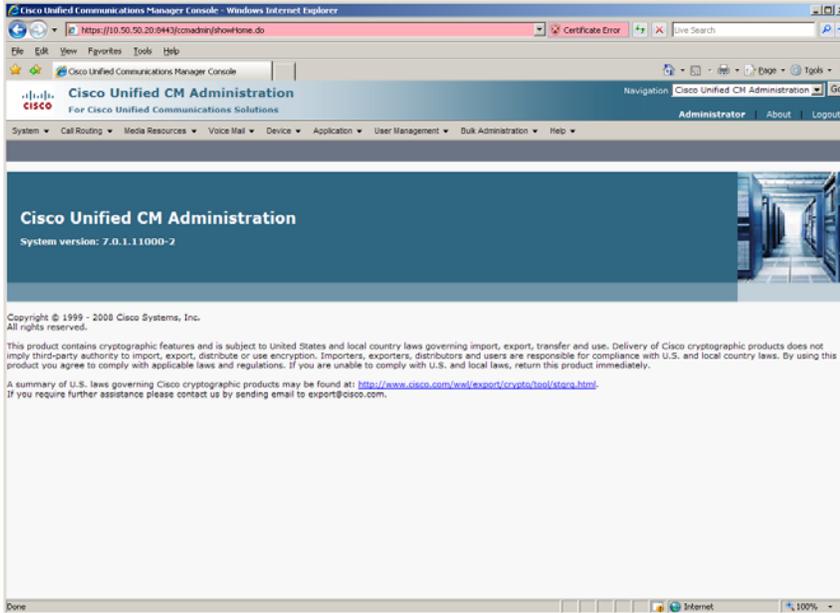
Press Find.



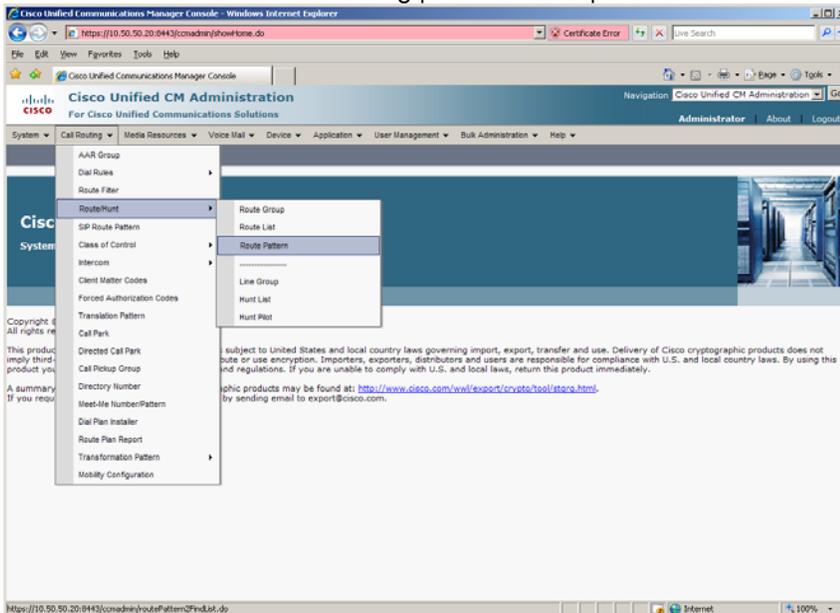
The status of the Cisco MGCP T1 Port should show a status of Registered with CUCM server.

5.9.2 Configure Call Routing

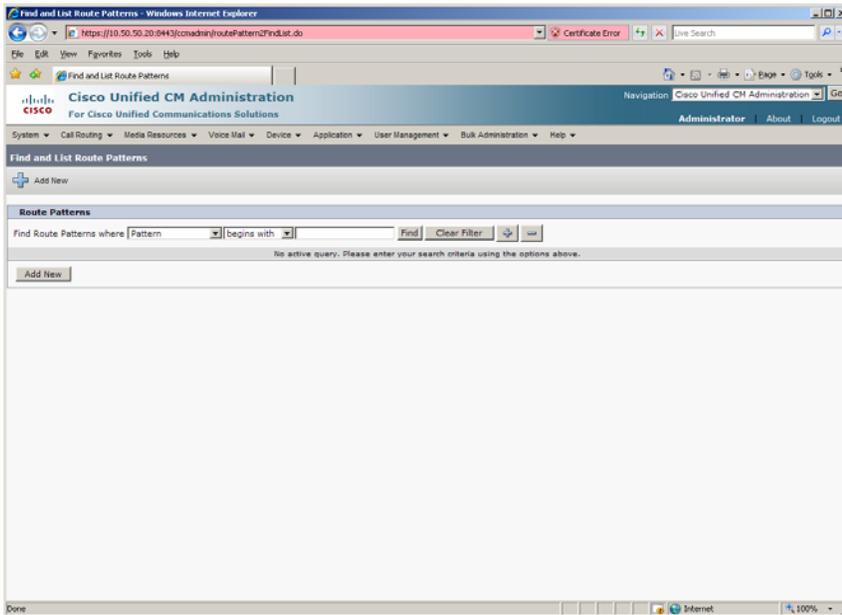
Using a web browser, log into the Cisco Unified CM Administration screen.



From the menu select Call Routing | Route / Hunt | Route Pattern.



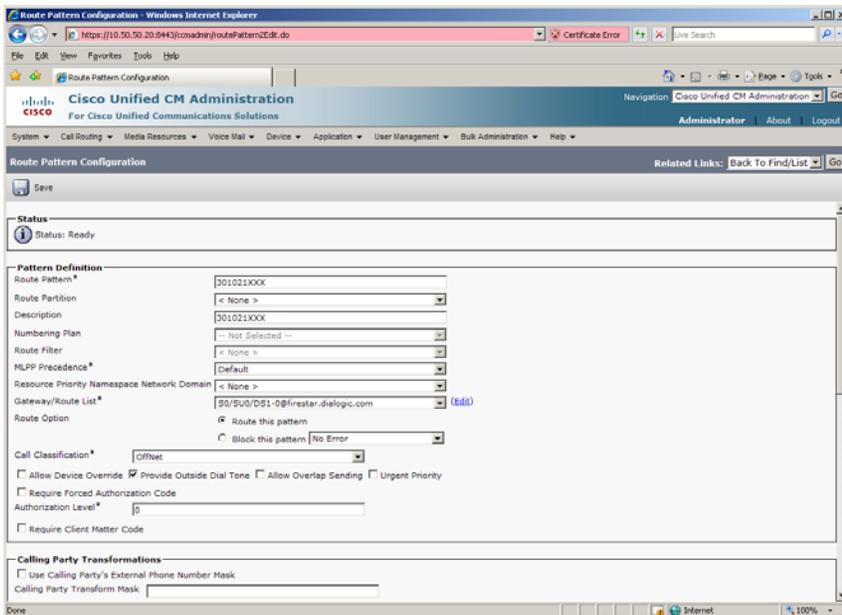
The following screen will appear.



Press Add New
Set the following:

- Route Pattern: 301021XXX
- Description: 301021XXX
- Gateway/Route List: S0/SU0/DS1-0@firestar.dialogic.com
- Call Classification: OffNet

Note: S0/SU0/DS1-0@firestar.dialogic.com is the MGCP Trunk of the Gateway



Press Save



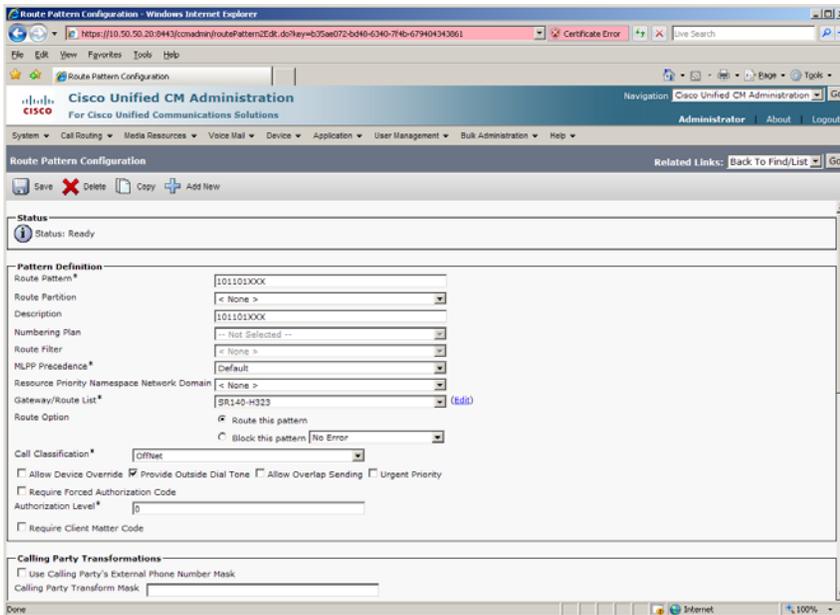
Press OK



Press OK

Repeat the same steps and set the following to route to the SR140:

- Route Pattern: 101101XXX
- Description: 101101XXX
- Gateway/Route List: SR140-H323
- Call Classification: OffNet



6 SIP / SIP Configuration Details

6.1 Cisco Unified Communication Manager 7.0 –SIP / SIP Configuration

Vendor	Cisco
Model	Cisco Unified Communication Manager
Software Version	7.0.1.11000-2
Protocol to SR140	SIP
Protocol to Gateway	SIP

6.2 Cisco 2800 Gateway

Vendor	Cisco
Model	Cisco 2800 Integrated Service Router
Software Version	Cisco IOS Software, 2800 Software (C2800NM-SPSERVICESK9-M), Version 12.4(3i), RELEASE SOFTWARE (fc2)
PSTN Device	Dialogic® Brooktrout® TR1034 Fax Board
Protocol to PSTN Device	T1 Robbed Bit Signaling with E&M Wink Start signal protocol
IP Device	Dialogic® Brooktrout® SR140 Fax Software and Cisco CUCM 7.0
Protocol to CUCM	SIP

6.3 Dialogic® Brooktrout® SR140 Fax Software

Vendor	<i>Dialogic</i>
Model	<i>Dialogic® Brooktrout® SR140 Fax Software</i>
Software Version	<i>SDK 5.2.7 SDK 6.0.2 SDK 6.1.0</i>
Protocol to CUCM	<i>SIP</i>
callctrl.cfg file	<i>All defaults</i>

6.4 Dialogic® Brooktrout® TR1034 Fax Board

Vendor	<i>Dialogic</i>
PSTN Device	<i>Dialogic® Brooktrout® TR1034 Fax Board</i>
Software Version	<i>SDK 5.2.7 SDK 6.0.2 SDK 6.1.0</i>
Protocol to GW	<i>T1 Robbed Bit Signaling with E&M Wink Start signal protocol</i>
callctrl.cfg file	<i>All defaults</i>

6.5 Network System Configuration – SIP / SIP Configuration

The diagram below details the sample configuration used in connection with the SIP / SIP Configuration.

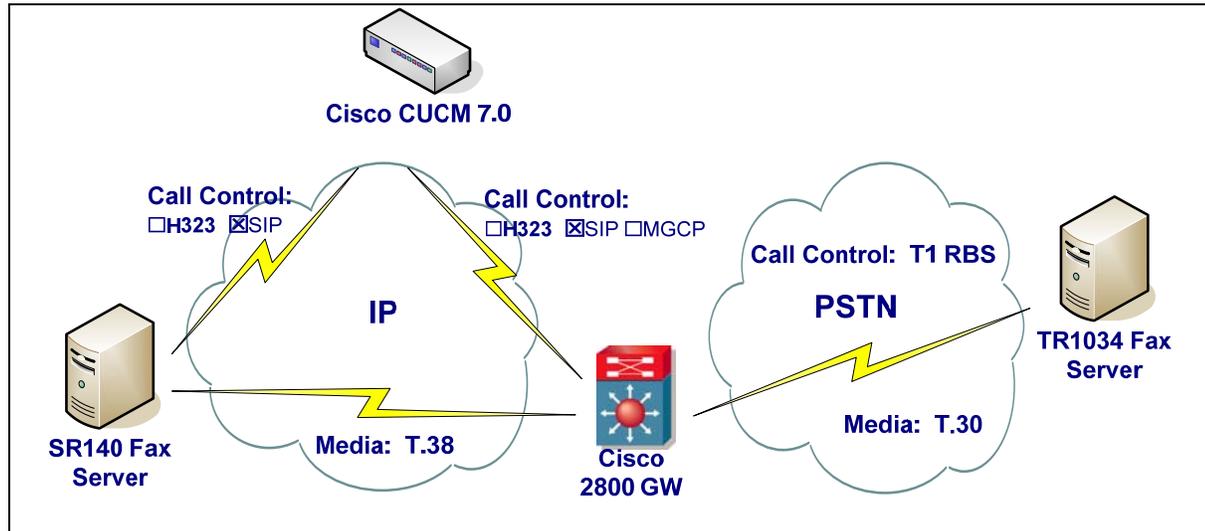


Diagram Notes:

- SR140 Fax Server = Fax Server including Dialogic® Brooktrout® SR140 Fax Software and third party fax application
- TR1034 Fax Server = Fax Server including Dialogic® Brooktrout® TR1034 Fax Board and third party fax application

6.5.1 Network Addresses

Device #	Device Make, Model, and Description	Device IP Address
1	Dialogic® Brooktrout® SR140	10.50.50.101
2	Cisco Unified Communication Manager 7.0	10.50.50.20
3	Cisco 2800 Integrated Service Router	10.50.50.21

6.5.2 Dialing Plan Overview

To call the SR140 from a POTS phone, dial 201101xxx, where x is a number between 0 and 9.

POTS(dial 201101xxx)—T1 RBS—>

Gateway(dial 201101xxx@10.50.50.20)—SIP—>

CUCM7.0.x(dial 201101xxx@10.50.50.101)—SIP—>SR140

To call the POTS lines of the Gateway from the SR140, dial 201021xxx@10.50.50.20, where x is a number between 0 and 9.

```
SR140(dial 201021xxx@10.50.50.20)—SIP—>  
CUCM7.0.x(dial 201021xxx@10.50.50.21)—SIP—>  
Gateway(dial 201021xxx)—T1 RBS—>POTS
```

6.6 Dialogic® Brooktrout® SR140 Fax Software Setup Notes

For the sample test configuration, the SR140 was configured using the default values, consult the Dialogic® Brooktrout® Fax Products Installation and Configuration Guide for details.

The Installation and Configuration Guides for SDK 5.2.x, SDK 6.0.x and SDK 6.1.x are available from the site:

<http://www.dialogic.com/manuals/brooktrout/default.htm>

Note: DHCP cannot be used.

6.7 Dialogic® Brooktrout® TR1034 Fax PSTN Setup Notes

For the sample test configuration, the TR1034 was configured using the default values, consult the Dialogic® Brooktrout® Fax Products Installation and Configuration Guide for details.

6.8 Cisco 2800 Gateway Setup Notes

For the sample test configuration, the Cisco 2800 Gateway was configured the Cisco IOS Command-Line Interface. The specific items configured include:

- Enable T.38 support
- Configure line card interface
- Configure IP Protocol
- Configure Dial-Peers – POTS
- Configure Dial-Peers – VoIP

6.8.1 Enable T.38 support

The following lines will allow T.38 fax calls.

```
voice service voip  
    fax protocol t38 ls-redundancy 2 hs-redundancy 0 fallback none
```

6.8.2 Configure line card interface

The following lines will allow T1 Robbed Bit Signalling with E&M Wink Start signal protocol.

```
controller T1 0/0/0
    framing esf
    clock source internal
    linecode b8zs
    cablelength short 133
    ds0-group 0 timeslots 1-24 type e&m-wink-start dtmf dnis
    description E&M Wink Start T1-RBS
```

Note: the ds0-group line must contain dtmf dnis when doing Wink Start.

6.8.3 Configure IP Protocol

The following will allow SIP calls.

```
voice service voip
    fax protocol t38 ls-redundancy 2 hs-redundancy 0 fallback none
    sip
```

6.8.4 Configure Dial-Peers - POTS

The following will allow the phone numbers 201021000 to 201021999 to be dialed out through the POTS lines.

```
dial-peer voice 201021000 pots
    destination-pattern 201021[0-9][0-9][0-9]
    no digit-strip
    direct-inward-dial
    port 0/0/0:0
```

6.8.5 Configure Dial Peers - VoIP

The following will allow the phone numbers 201101000 to 201101999 to be dialed out through SIP to CUCM.

```
dial-peer voice 201101000 voip
    description SIP to CUCM
    destination-pattern 201101...
    session protocol sipv2
    session target ipv4:10.50.50.20
    session transport udp
    codec g711ulaw
```

Note: The session target ipv4 contains the IP address for CUCM.

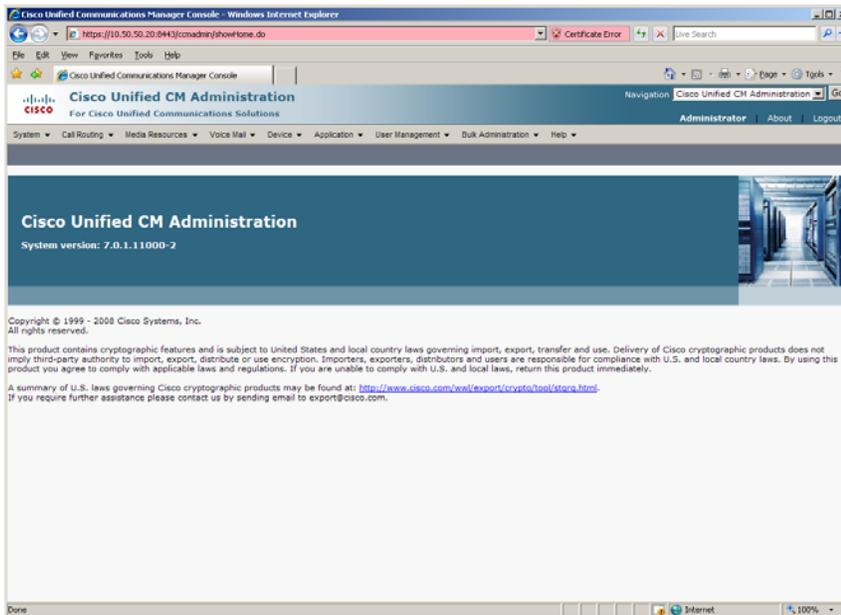
6.9 CUCM 7.0 Setup Notes – SIP / SIP Configuration

The CUCM 7.0 configuration values that were used in the sample configuration involve configuring the following items:

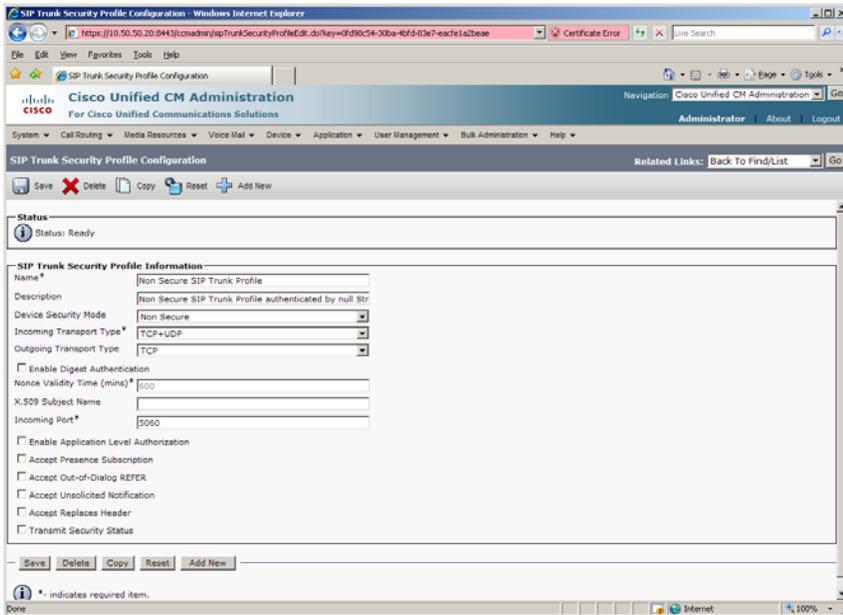
- Configure Service Activation – refer to [section 4.9.1](#)
- Configure License – refer to [section 4.9.2](#)
- Configure SIP Trunk Security Profile
- Configure SR140 Trunk
- Configure Gateway Trunk
- Configure Call Routing

6.9.1 Configure SIP Trunk Security Profile

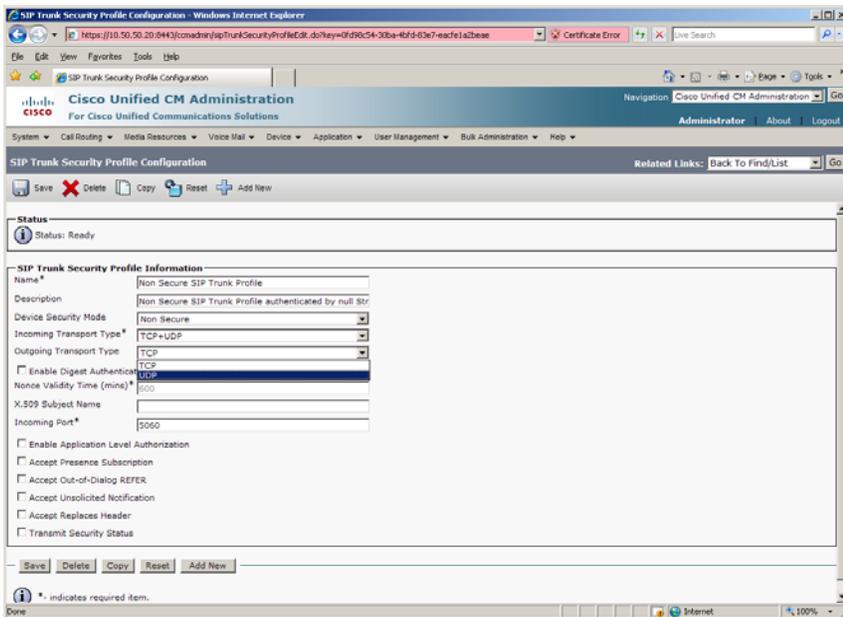
Using a web browser, log into CUCM 7.0. The following Cisco Unified CM Administration screen appears.



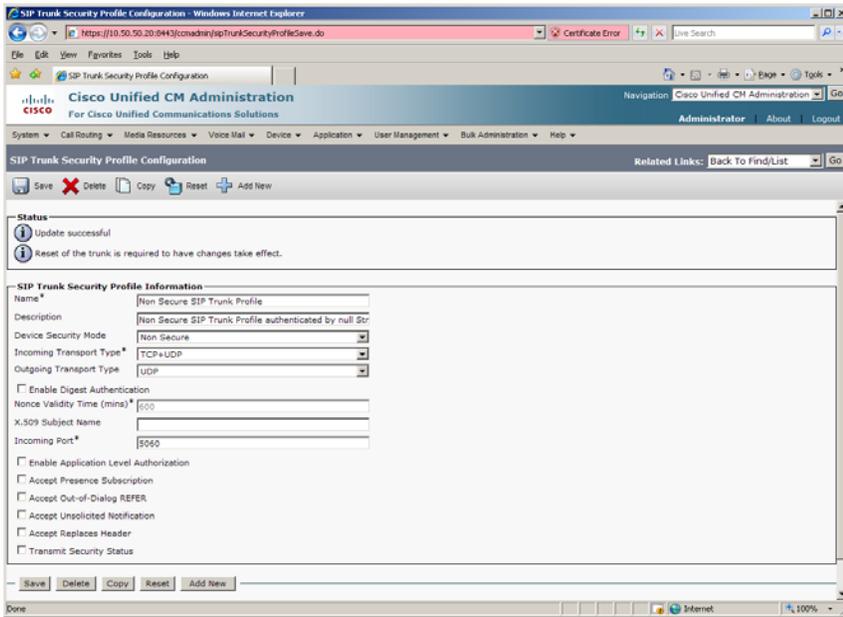
From the menu select System | Security Profile | SIP Trunk Security Profile.



Change Outgoing Transport Type to UDP.

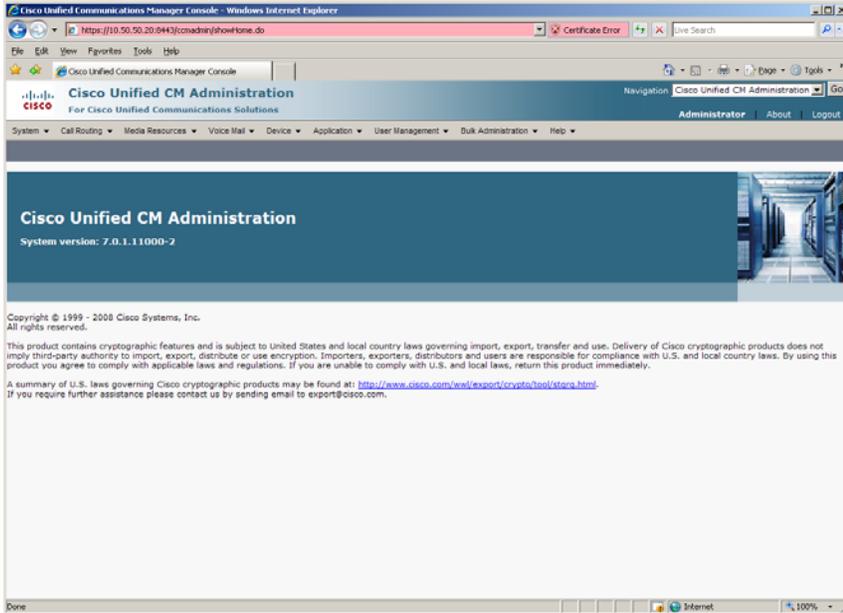


Press Save.

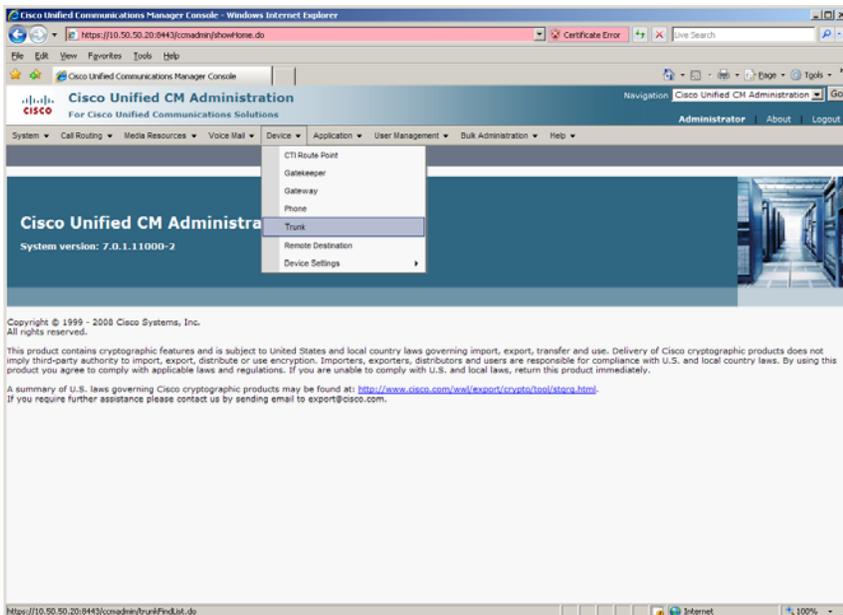


6.9.2 Configure SR140 Trunk

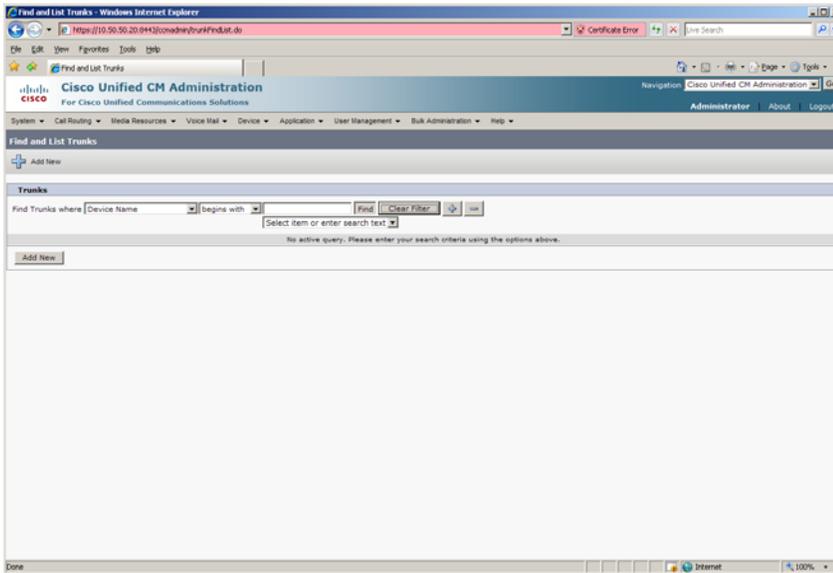
Using a web browser, log into the Cisco Unified CM Administration screen.



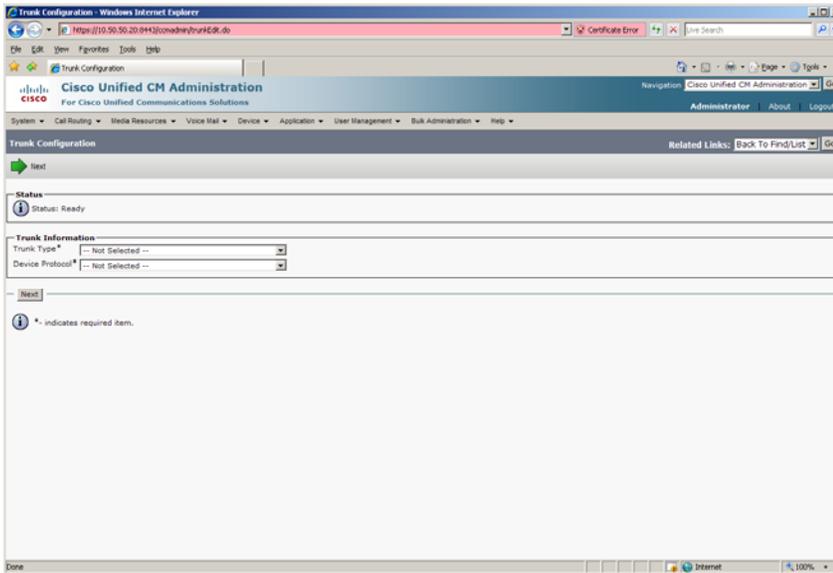
From the menu select Device | Trunk.



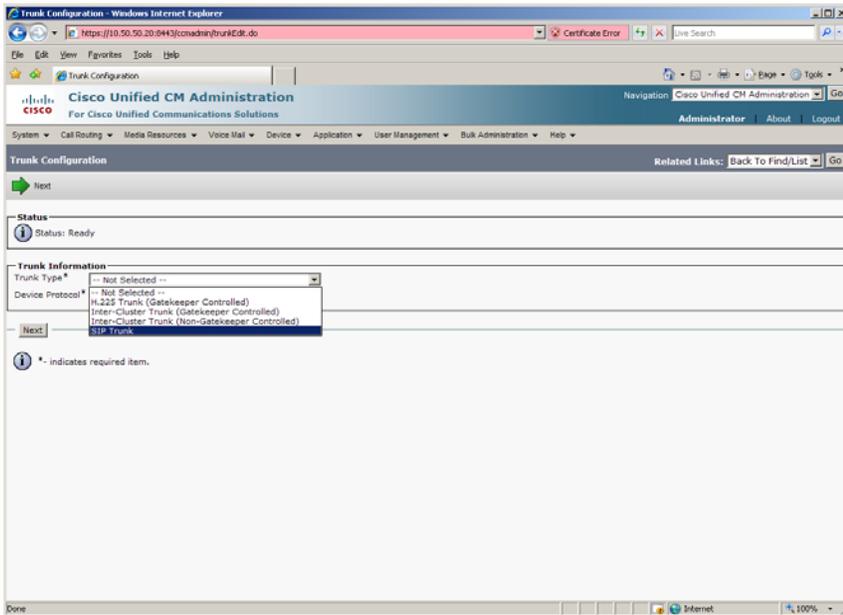
The following screen will appear.



Press Add New to add a new SIP Trunk.



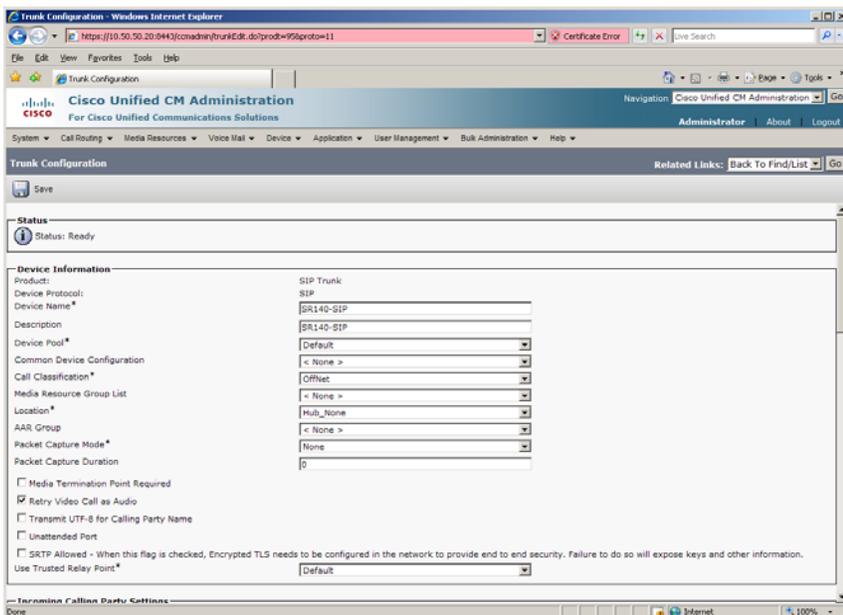
Select SIP Trunk for the Trunk Type.

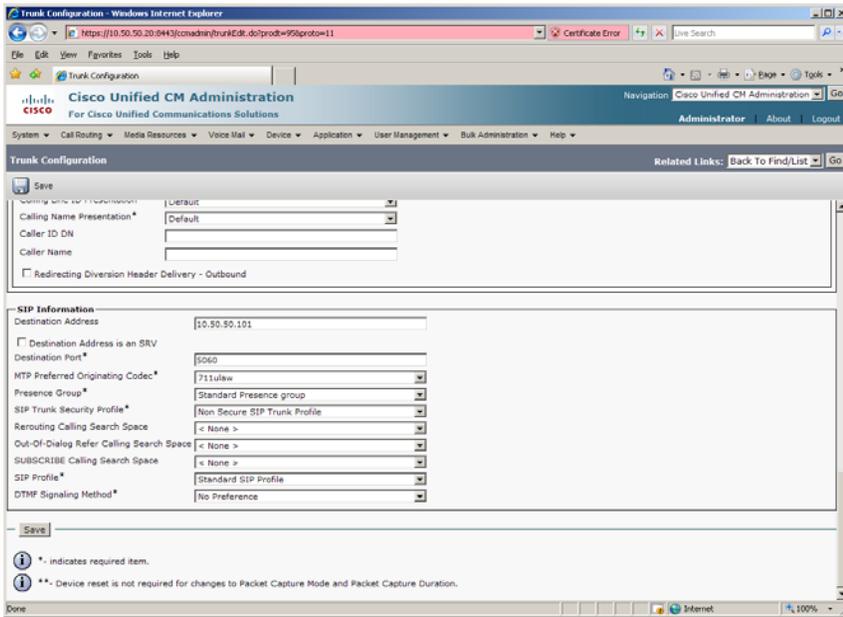


Select SIP for the Device Protocol and press Next.
Set the following:

- Device Name: SR140-SIP
- Device Description: SR140-SIP
- Device Pool: Default
- Call Classification: OffNet
- Destination Address: 10.50.50.101
- SIP Trunk Security Profile: Non Secure SIP Trunk Profile
- SIP Profile: Standard SIP Profile

Note: Destination Address is the IP address of the SR140.

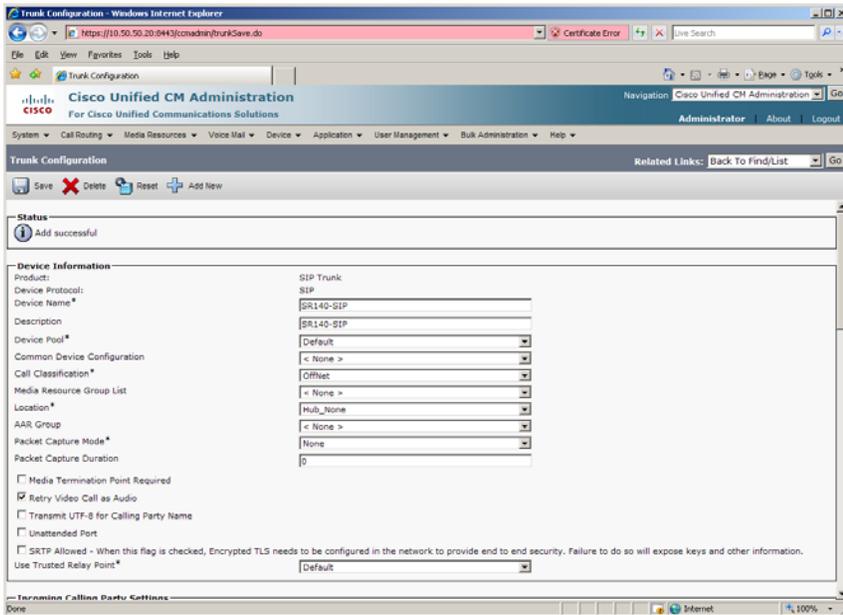




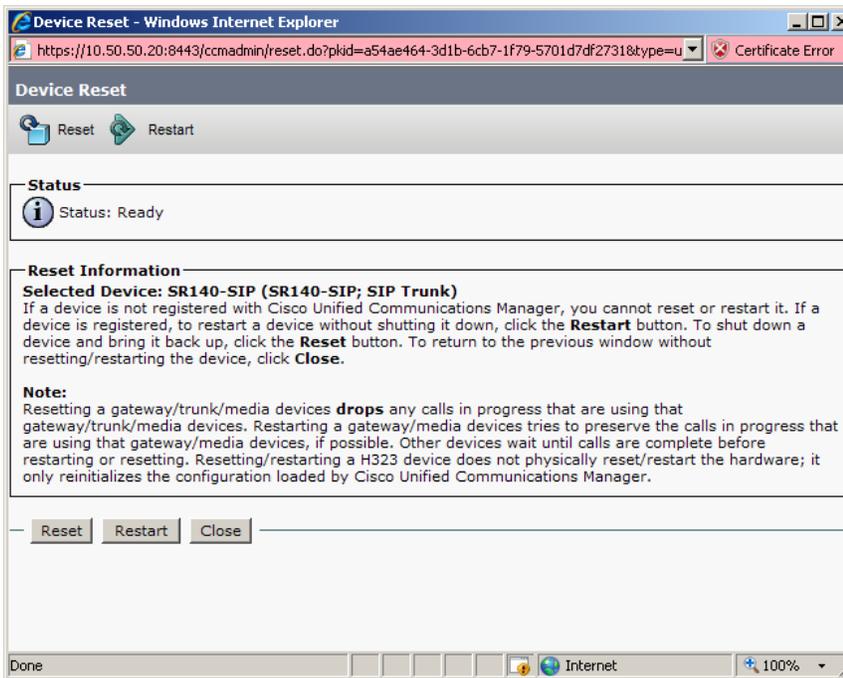
Press Save



Press OK



Press Reset

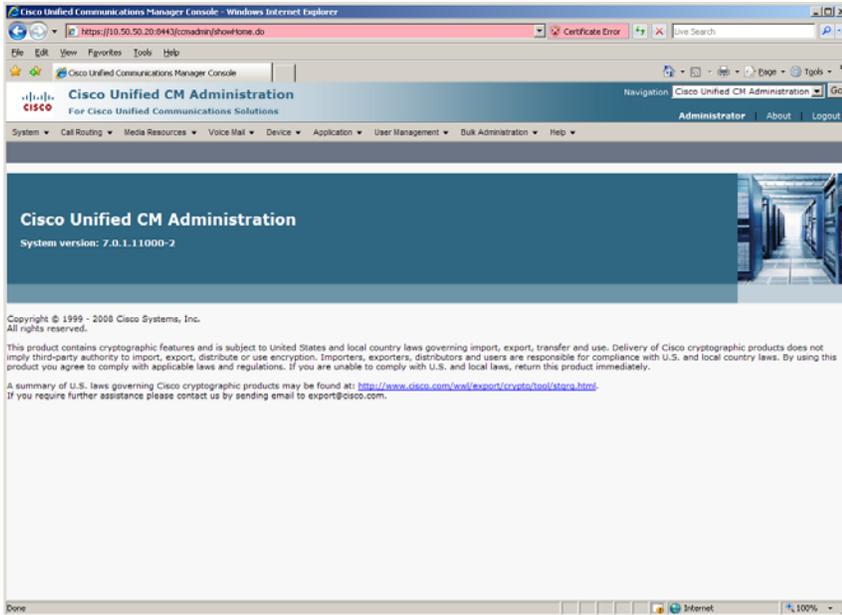


Press Restart then press Close

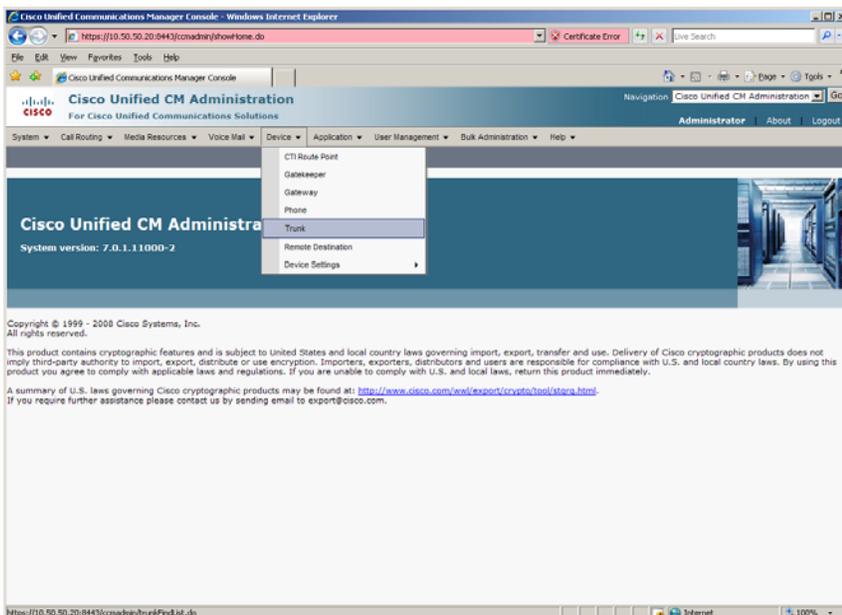
6.9.3 Configure Gateway Trunk

The following section describes an example on how to configure the gateway trunk. If your network is already configured, you may skip this section.

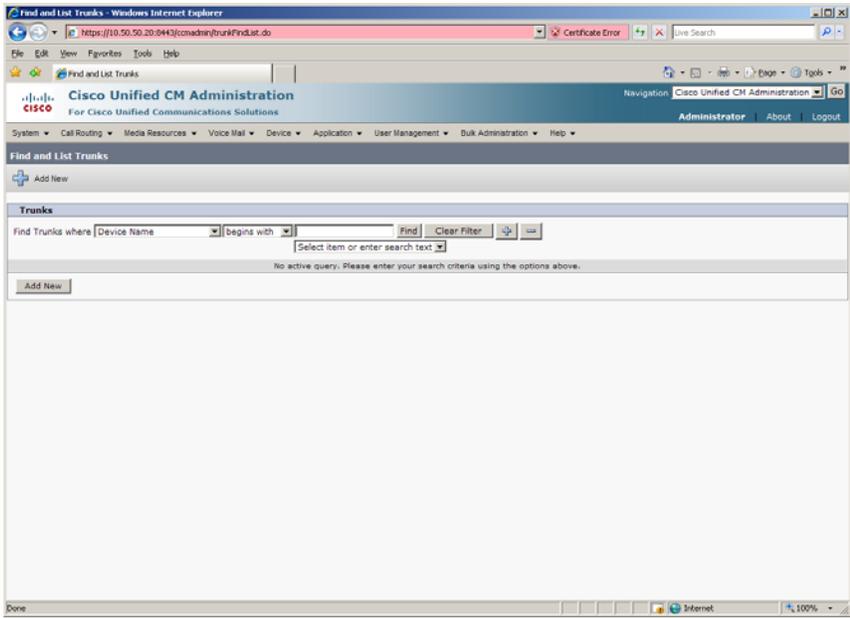
Using a web browser, log into the Cisco Unified CM Administration screen.



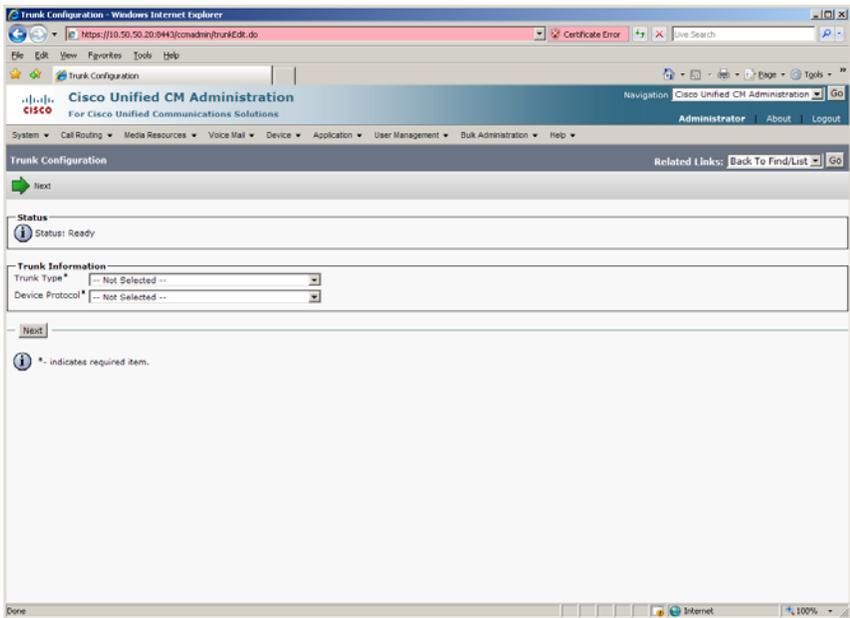
From the menu select Device | Trunk.



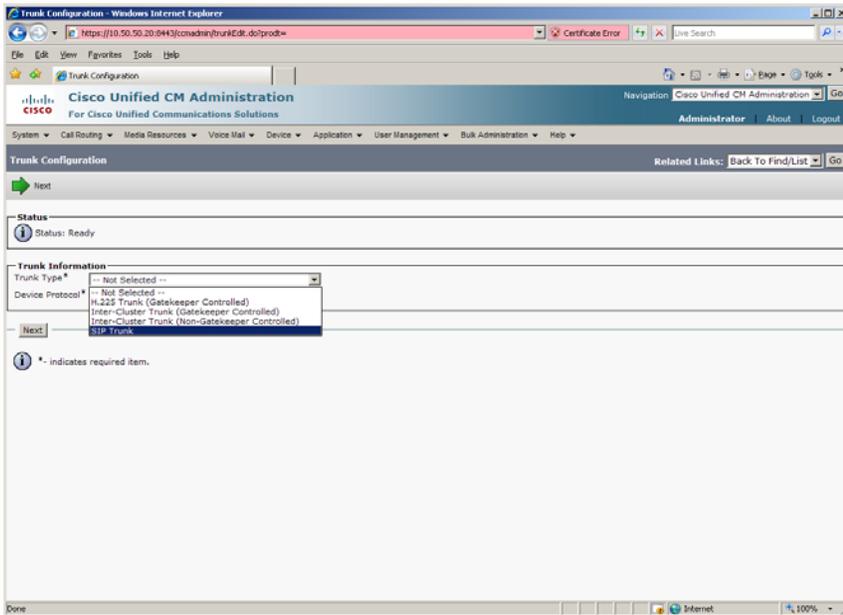
The following screen will appear.



Press Add New to add a new SIP Trunk.



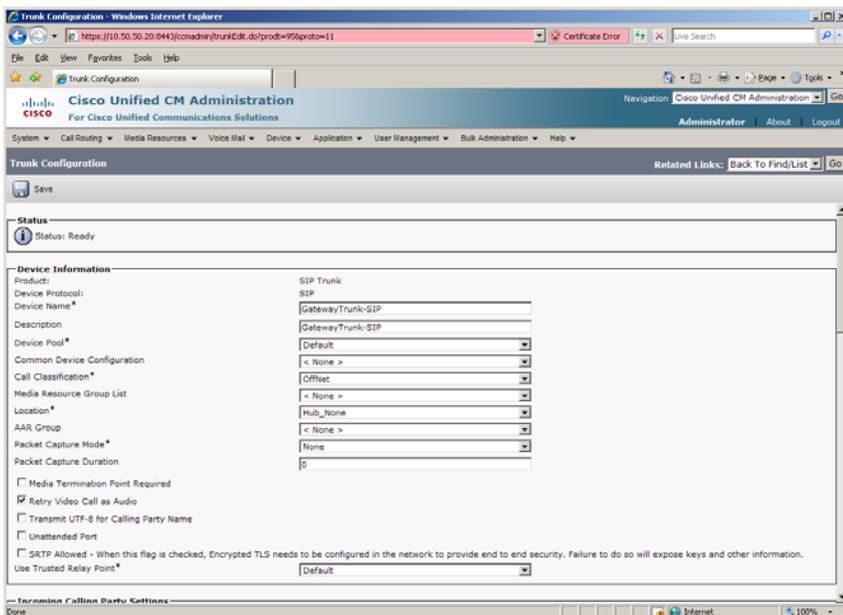
Select SIP Trunk for the Trunk Type.

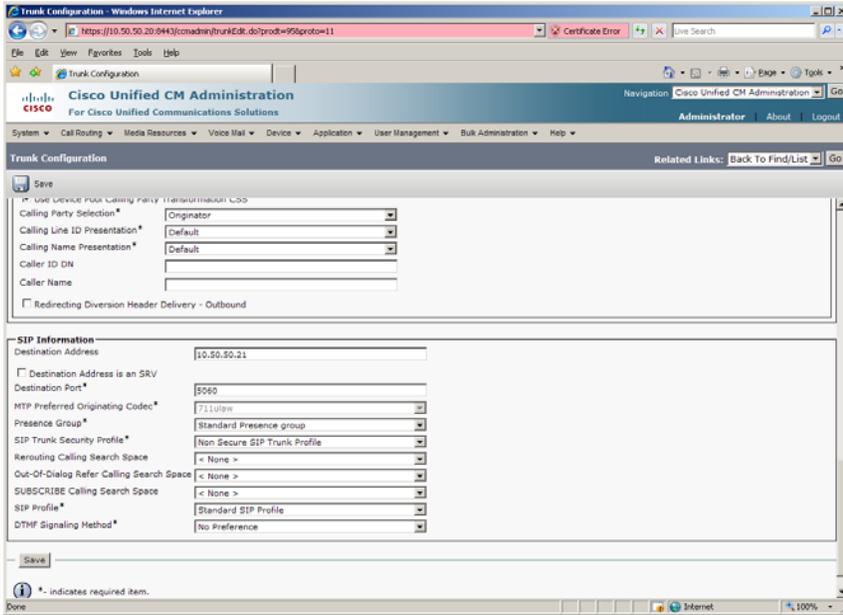


Select SIP for the Device Protocol and press Next.
Set the following:

- Device Name: GatewayTrunk-SIP
- Device Description: GatewayTrunk -SIP
- Device Pool: Default
- Call Classification: OffNet
- Destination Address: 10.50.50.21
- SIP Trunk Security Profile: Non Secure SIP Trunk Profile
- SIP Profile: Standard SIP Profile

Note: Destination Address is the IP address of the Gateway.

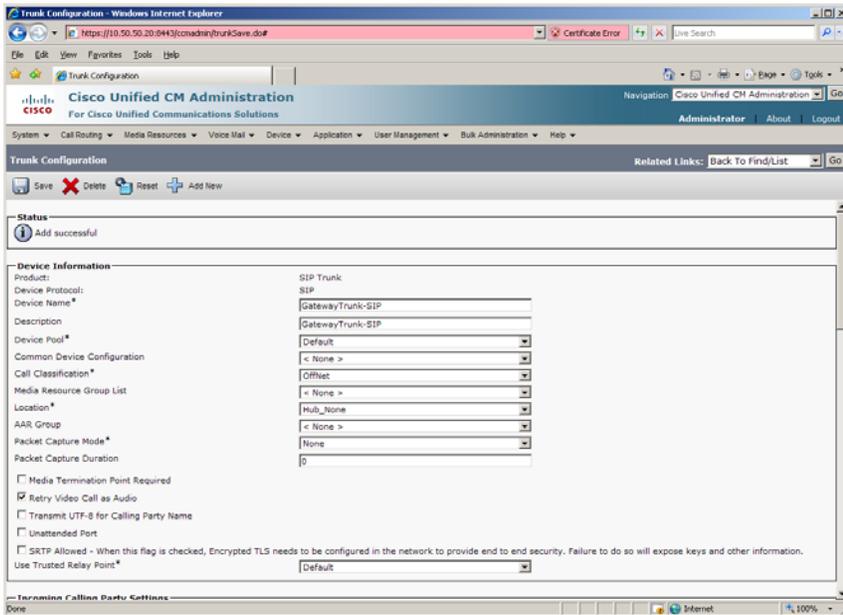




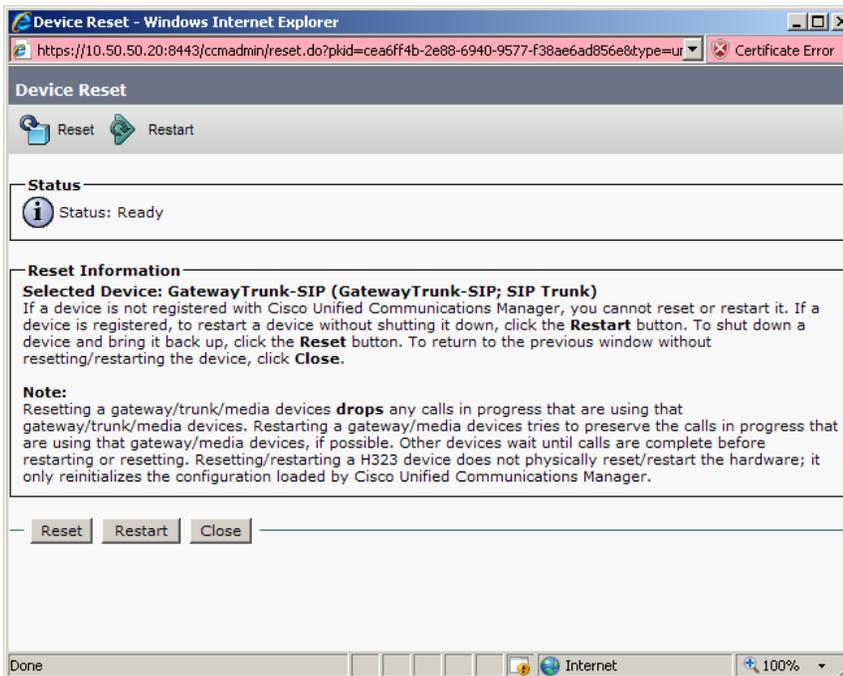
Press Save



Press OK



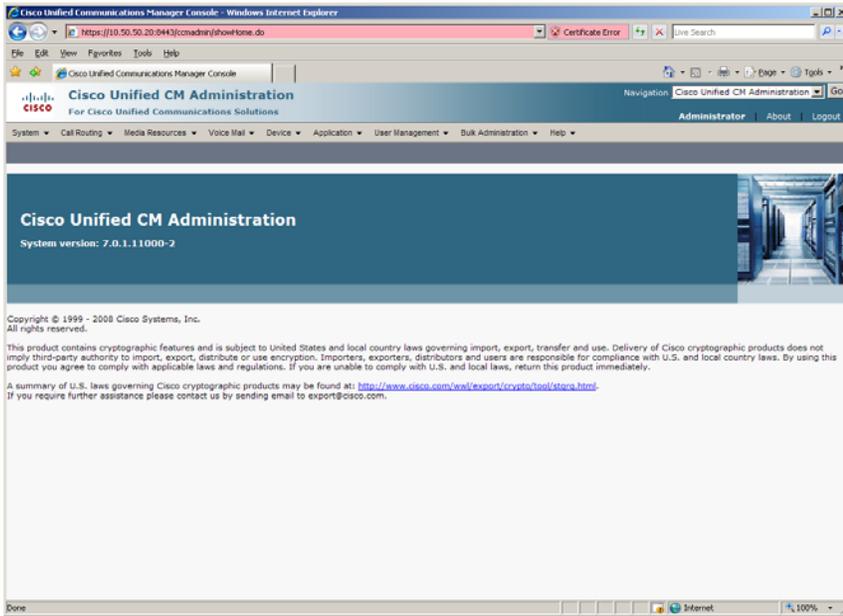
Press Reset



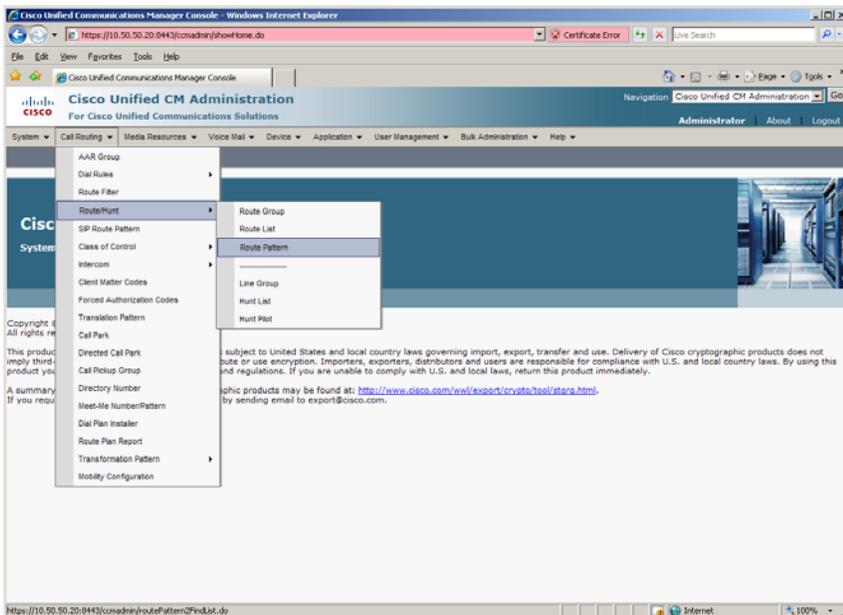
Press Restart then press Close

6.9.4 Configure Call Routing

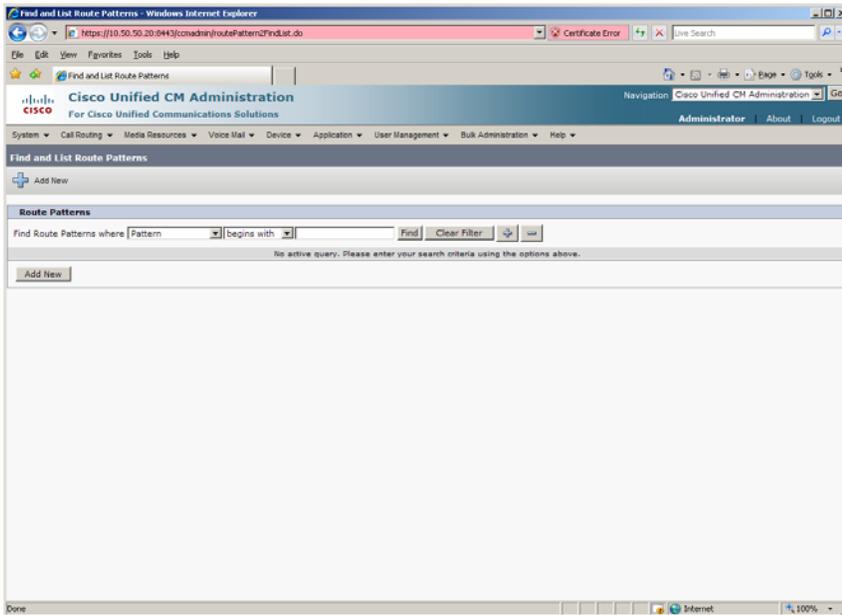
Using a web browser, log into the Cisco Unified CM Administration screen.



From the menu select Call Routing | Route / Hunt | Route Pattern.

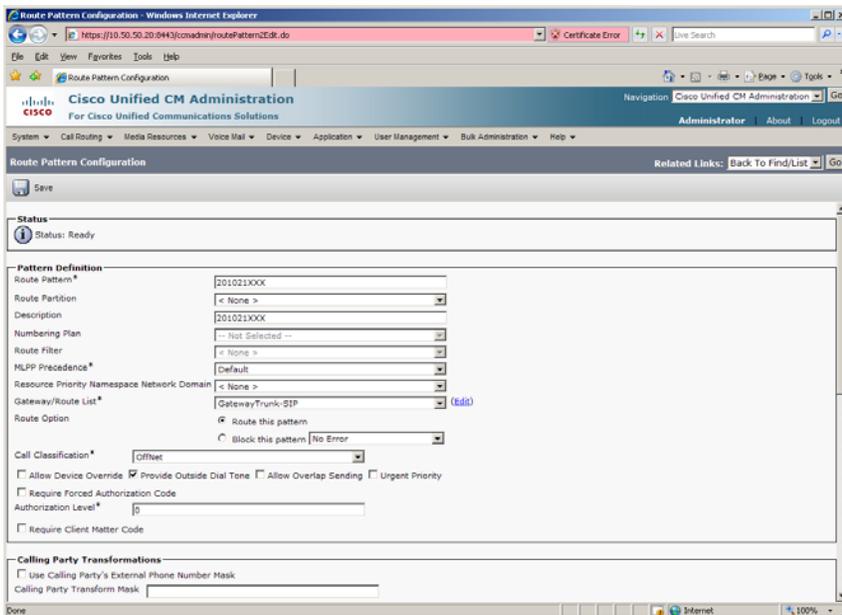


The following screen will appear.



Press Add New
Set the following:

- Route Pattern: 201021XXX
- Description: 201021XXX
- Gateway/Route List: GatewayTrunk-SIP
- Call Classification: OffNet



Press Save



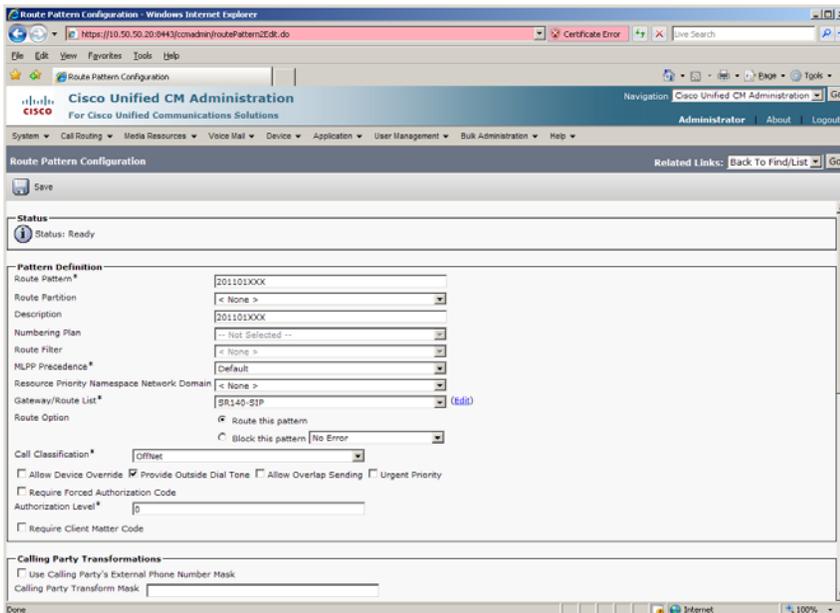
Press OK



Press OK

Repeat the same steps and set the following to route to the SR140:

- Route Pattern: 201101XXX
- Description: 201101XXX
- Gateway/Route List: SR140-SIP
- Call Classification: OffNet



7 SIP / MGCP Configuration Details

7.1 Cisco Unified Communication Manager 7.0 – SIP / MGCP Configuration

Vendor	Cisco
Model	Cisco Unified Communication Manager
Software Version	7.0.1.11000-2
Protocol to SR140	SIP
Protocol to Gateway	MGCP

7.2 Cisco 2800 Gateway

Vendor	Cisco
Model	Cisco 2800 Integrated Service Router
Software Version	Cisco IOS Software, 2800 Software (C2800NM-SPSERVICESK9-M), Version 12.4(3i), RELEASE SOFTWARE (fc2)
PSTN Device	Dialogic® Brooktrout® TR1034 Fax Board
Protocol to PSTN Device	T1 Robbed Bit Signaling with E&M Wink Start signal protocol
IP Device	Dialogic® Brooktrout® SR140 Fax Software and Cisco CUCM 7.0
Protocol to CUCM	MGCP

7.3 Dialogic® Brooktrout® SR140 Fax Software

Vendor	<i>Dialogic</i>
Model	<i>Dialogic® Brooktrout® SR140 Fax Software</i>
Software Version	<i>SDK 5.2.7 SDK 6.0.2 SDK 6.1.0</i>
Protocol to CUCM	<i>SIP</i>
callctrl.cfg file	<i>All defaults</i>

7.4 Dialogic® Brooktrout® TR1034 Fax Board

Vendor	<i>Dialogic</i>
PSTN Device	<i>Dialogic® Brooktrout® TR1034 Fax Board</i>
Software Version	<i>SDK 5.2.7 SDK 6.0.2 SDK 6.1.0</i>
Protocol to GW	<i>T1 Robbed Bit Signaling with E&M Wink Start signal protocol</i>
callctrl.cfg file	<i>All defaults</i>

7.5 Network System Configuration – SIP / MGCP Configuration

The diagram below details the sample configuration used in connection with the SIP / MGCP Configuration.

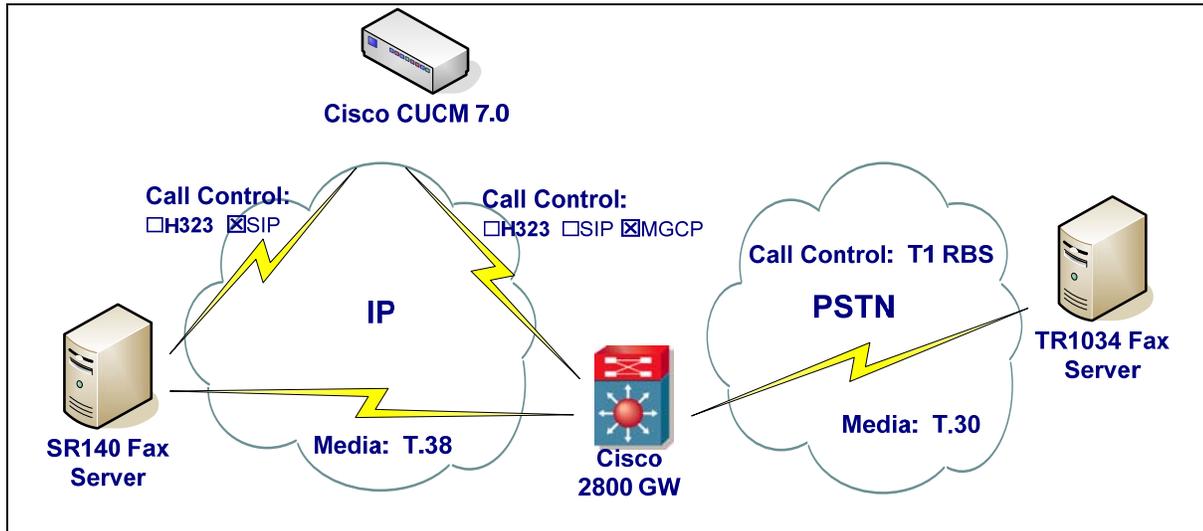


Diagram Notes:

- SR140 Fax Server = Fax Server including Dialogic® Brooktrout® SR140 Fax Software and third party fax application
- TR1034 Fax Server = Fax Server including Dialogic® Brooktrout® TR1034 Fax Board and third party fax application

7.5.1 Network Addresses

Device #	Device Make, Model, and Description	Device IP Address
1	Dialogic® Brooktrout® SR140	10.50.50.101
2	Cisco Unified Communication Manager 7.0	10.50.50.20
3	Cisco 2800 Integrated Service Router	10.50.50.21

7.5.2 Dialing Plan Overview

To call the SR140 from a POTS phone, dial 201101xxx, where x is a number between 0 and 9.

POTS(dial 201101xxx)—T1 RBS—>

Gateway(dial 201101xxx@10.50.50.20)—MGCP—>

CUCM7.0.x(dial 201101xxx@10.50.50.101)—SIP—>SR140

To call the POTS lines of the Gateway from the SR140, dial 301021xxx@10.50.50.20, where x is a number between 0 and 9.

```
SR140(dial 301021xxx@10.50.50.20)—SIP—>  
CUCM7.0.x(dial 301021xxx@10.50.50.21)—MGCP—>  
Gateway(dial 301021xxx)—T1 RBS—>POTS
```

7.6 Dialogic® Brooktrout® SR140 Fax Software Setup Notes

For the sample test configuration, the SR140 was configured using the default values, consult the Dialogic® Brooktrout® Fax Products Installation and Configuration Guide for details.

Note: DHCP cannot be used.

7.7 Dialogic® Brooktrout® TR1034 Fax PSTN Setup Notes

For the sample test configuration, the TR1034 was configured using the default values, consult the Dialogic® Brooktrout® Fax Products Installation and Configuration Guide for details.

The Installation and Configuration Guides for SDK 5.2.x, SDK 6.0.x and SDK 6.1.x are available from the site:

<http://www.dialogic.com/manuals/brooktrout/default.htm>

7.8 Cisco 2800 Gateway Setup Notes

For the sample test configuration, the Cisco 2800 Gateway was configured the Cisco IOS Command-Line Interface. The specific items configured include:

- Configure line card interface
- Configure MGCP
- Configure Dial-Peers

7.8.1 Configure line card interface

The following lines will allow T1 Robbed Bit Signaling with E&M Wink Start signal protocol.

```
controller T1 0/0/0  
    framing esf  
    clock source internal  
    linecode b8zs  
    cablelength short 133  
    ds0-group 0 timeslots 1-24 type e&m-wink-start  
    description E&M Wink Start T1-RBS
```

Note: the ds0-group line must NOT contain dtmf dnis when doing Wink Start and MGCP.

7.8.2 Configure MGCP

The following will allow MGCP calls.

```
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server 10.50.50.20
!
mgcp
mgcp call-agent 10.50.50.20 2427 service-type mgcp version 0.1
mgcp default-package fxr-package
!
mgcp profile default
```

Note: 10.50.50.20 is the IP address of the CUCM.

Note: Verify that **mgcp fax t38 inhibit** is not present since it disables T.38

7.8.3 Configure Dial-Peers - POTS

With MGCP the dial-peers are configured on CUCM. The POTS port controlled by MGCP must be configured as follows:

```
dial-peer voice 301021000 pots
service mgcpapp
port 0/0/0:0
```

After configuring CUCM verify that the Gateway is registered with the command **sh ccm-manager**.

```
firestar#sh ccm-manager
MGCP Domain Name: firestar.dialogic.com
Priority      Status      Host
=====
Primary      Registered  10.50.50.20
First Backup  None
Second Backup None

Current active Call Manager: 10.50.50.20
Backhaul/Redundant link port: 2428
Failover Interval:          30 seconds
Keepalive Interval:         15 seconds
Last keepalive sent:        13:41:11 PCTime Apr 16 2009 (elapsed time: 00:00:03)
Last MGCP traffic time:     13:41:11 PCTime Apr 16 2009 (elapsed time: 00:00:03)
Last failover time:         None
Last switchback time:       None
Switchback mode:            Graceful
MGCP Fallback mode:         Not Selected
Last MGCP Fallback start time: None
Last MGCP Fallback end time: None
MGCP Download Tones:        Disabled
```

```
Configuration Error History:
FAX mode: cisco
```

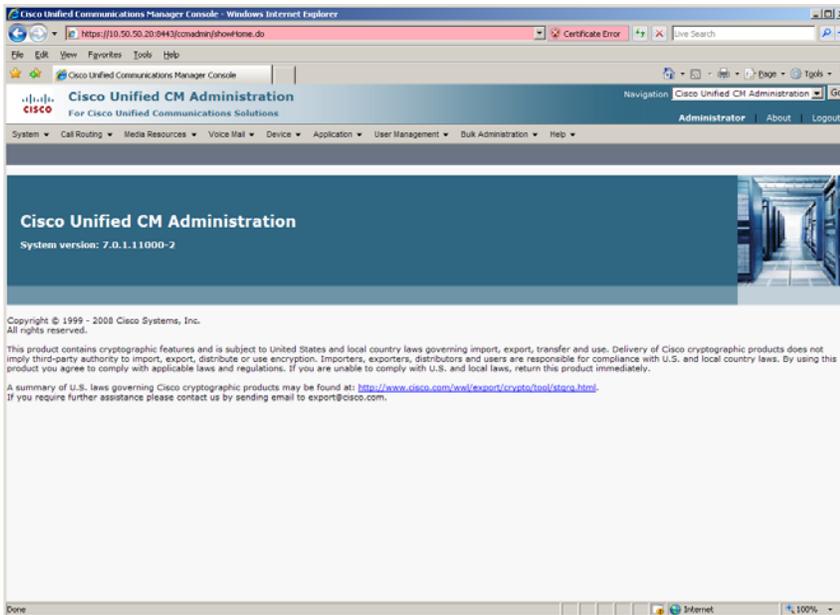
7.9 CUCM 7.0 Setup Notes – SIP / MGCP Configuration

The CUCM 7.0 configuration values that were used in the sample configuration involve configuring the following items:

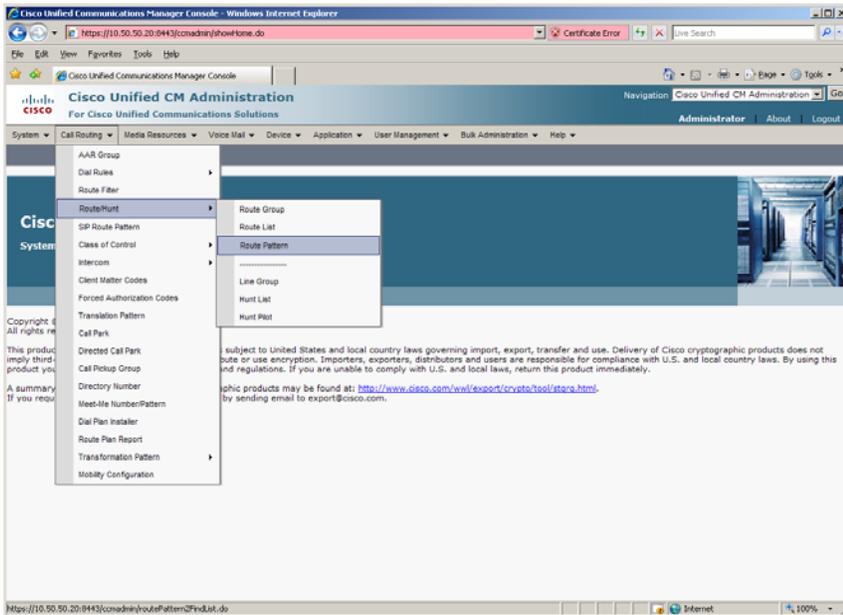
- Configure Service Activation – refer [section 4.9.1](#)
- Configure License – refer to [section 4.9.2](#)
- Configure SIP Trunk Security Profile – refer to [section 6.9.1](#)
- Configure SR140 Trunk – refer to [section 6.9.2](#)
- Configure Gateway Trunk – refer to [section 5.9.1](#)
- Configure Call Routing

7.9.1 Configure Call Routing

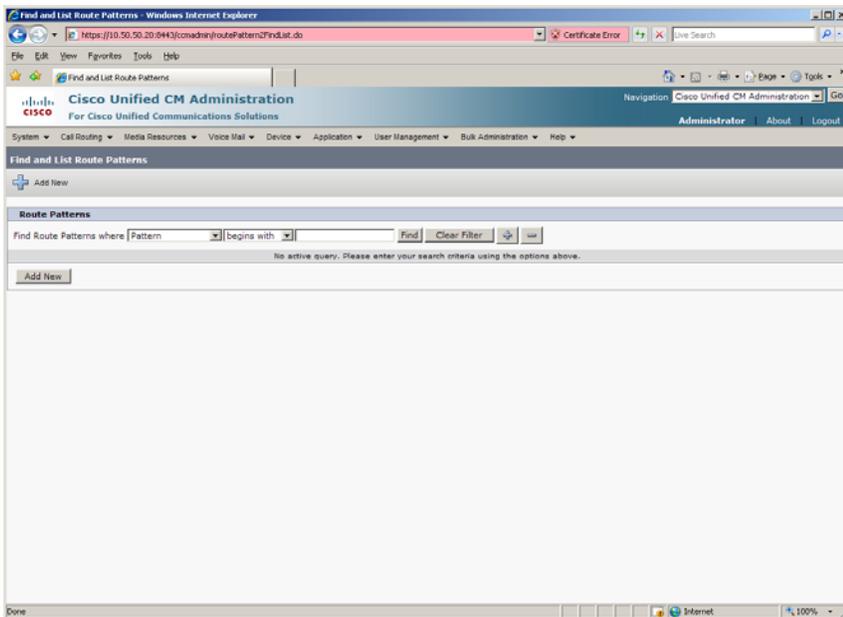
Using a web browser, log into the Cisco Unified CM Administration screen.



From the menu select Call Routing | Route / Hunt | Route Pattern.



The following screen will appear.

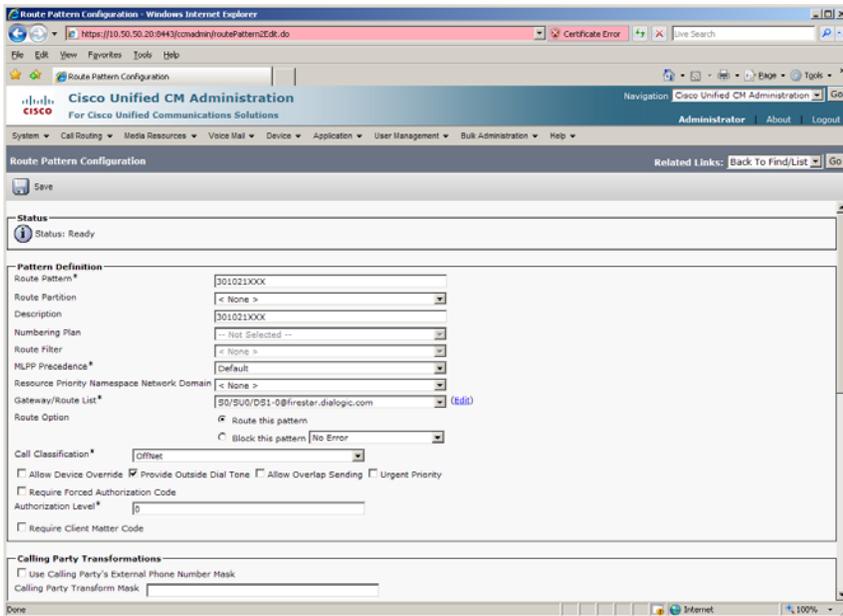


Press Add New

Set the following:

- Route Pattern: 301021XXX
- Description: 301021XXX
- Gateway/Route List: S0/SU0/DS1-0@firestar.dialogic.com
- Call Classification: OffNet

Note: S0/SU0/DS1-0@firestar.dialogic.com is the MGCP Trunk of the Gateway



Press Save



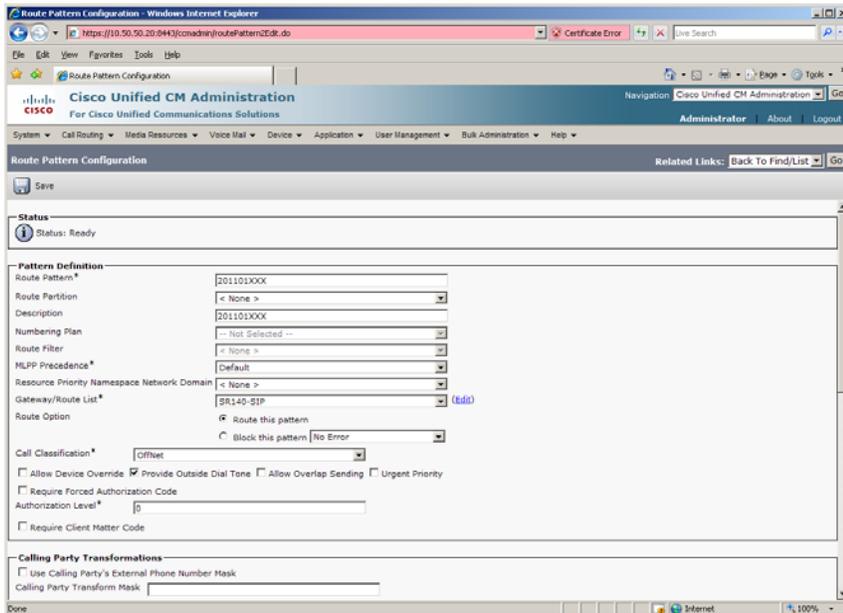
Press OK



Press OK

Repeat the same steps and set the following to route to the SR140:

- Route Pattern: 201101XXX
- Description: 201101XXX
- Gateway/Route List: SR140-SIP
- Call Classification: OffNet



8 References

- Dialogic® Brooktrout® Fax Products Installation and Configuration Guide for SDK 5.2.x, 6.0.x, and 6.1.x
<http://www.dialogic.com/manuals/brooktrout/default.htm>
- CUCM Documentation Roadmaps
http://www.cisco.com/en/US/products/sw/voicesw/ps556/products_documentation_roadmaps_list.html
- How to Configure MGCP with Digital PRI and Cisco CallManager, Document ID 23966:
http://www.cisco.com/en/US/tech/tk1077/technologies_configuration_example_09186a00801ad22f.shtml
- MGCP with Digital CAS and Cisco CallManager Configuration Example, Document ID 43802:
http://www.cisco.com/en/US/tech/tk1077/technologies_configuration_example_09186a008022eaa3.shtml
- Understanding Cisco IOS H.323 Gatekeeper Call Routing - Document ID 24462.
http://www.cisco.com/en/US/tech/tk1077/technologies_tech_note09186a00800_a8928.shtml