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## Introduction

This document describes the Cisco IPMA feature on Call Manger. This feature enables to route the calls to manager/assistant effectively as per the requirement. Based on the filter set on the manager's phone, calls can be routed directly to the manager or to the assistant depending on manager's availability. Alternatively, the filters for manager can also be set from the assistant's phone, thereby, making it a scalable feature.

## Prerequisites

### Requirements

Cisco recommends that you have a basic knowledge of these topics:

- Call Routing and C Route Points
- Calling Search Space (CSS) and Partitions
- Configuring IP Phones on Cisco Unified Communications Manager (CUCM)

## Components Used

The information in this document is based on these software versions:

- Cisco Unified Communications Manager 9.1(2)
- Cisco IP Manager Assistant Service

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.

## Background Information

Cisco IPMA feature is widely used to manage the calls to manager/assistant effectively. It provides redundancy by allowing to configure the primary and secondary IPMA servers in the cluster, however, at a time only one can be active.

This feature in two modes is based on the requirement:

- Proxy Line Mode
- Shared Line Mode

**Proxy Line:** Assistant's line on the phone acts as a proxy line to manager. Apart from Assistant's primary line, you need to configure a new line on assistant's phone for each manager associated with it. This created line for each manager on assistant phone acts as a proxy line. Cisco IPMA uses these proxy lines to attend the calls for manager from assistant's phone.

- CTI Route Point should have the same Directory Number (DN) as that of manager or the superset of it.
- CTI Route Point and Assistant DN must be reachable by all phones and to each other as well. However, Manager's DN should only be reachable from CTI Route Point and Assistant DN.
- This CTI Route Point needs to be configured in IPMA service parameters which associates it this service. Once associated, all the calls to Manager's phone will hit the CTI Route Point since it is accessible by all phones and based on IPMA parameters the service will route the calls to assistant/manager.
- The CTI Route Point should be configured for the Call Forward No Answer feature to the Manager/Assistant phone so as not to drop in the call in case of IPMA down/CTI down.

**Shared Line:** In this mode, the line number on the Manager and Assistant phones is same. When a call comes to manager, it rings the assistant's phone at the same time. The manager or assistant can pick the phone as per requirement. If the manager does not want to take anymore calls and want's assistant to attend all the calls, he needs to enable **Do Not Disturb** (DND) option of the IPMA feature.

## Configure

Here are the pre-configuration tasks:

1. Register two IP Phones on the Call Manager. (In this case Cisco 7975 & Cisco 7965)
2. Create an enduser Assistant and associate this user with the Assistant's phone and vice versa. (In this case it is Cisco 7975:[00083031ED49](#))

3. Create an enduser Manager and associate this user with the Manager's phone and vice versa. (In this case it is Cisco 7965:[F02929E2D831](#))




Steps to configure IPMA:

1. Create a Service for IPMA.
2. Partitions and Calling Search Space.
3. Configure Assistant Phone.
4. Configure Manager Phone.
5. Configure Manager Enduser.
6. Configure Assistant Enduser.
7. Configure CTI Route Point.
8. Configure IPMA Service Parameter.
9. Cisco Unified Communication Manager Assistant Console (optional)

## Step 1. Create a Service for IPMA


1. Log in to the CUCM Administration web GUI.
2. Navigate to **Device > Device Settings > Phone Services**.
3. Add a new Service and name it as IPMA.
4. In the Service URL provide the following URL: (CUCM - Call Manager).  
http://<CUCM-IP>:8080/ma/servlet/MAService?cmd=doPhoneService&Name=#DEVICENAME#
5. Check the **Enable** parameter and click **Save**.

### IP Phone Services Configuration

Save  Delete  Update Subscriptions  Add New

---

**- Status -**

 Update successful

---

**- Service Information -**

Service Name*	IPMA
ASCII Service Name*	IPMA
Service Description	Primary
Service URL*	http://10.127.227.117:8080/ma/servlet/MAService?cmd=doPh
Secure-Service URL	
Service Category*	XML Service
Service Type*	Standard IP Phone Service
Service Vendor	
Service Version	

Enable

## Step 2. Partitions and Calling Search Space

1. Log in to the CUCM Administration web GUI.
2. Navigate to **Call Routing > Class of Control > Partition.**
3. Create two partitions: ptmanager and ptinternal.
4. Navigate to **Call Routing > Class of Control > Calling Search Space.**
5. Create two CSS, cssmanager:(ptmanager+ptinternal) and cssdefault:(ptinternal).

## Step 3. Configure Assistant Phone

1. Log in to the CUCM Administration web GUI.
2. Navigate to **Device > Phone > Phone configuration page (Assistant Phone).**
3. Select the softkey template to Standard Assistant.
4. Create a new line as a primary DN of Assistant in partition ptinternal and CSS as cssdefault.
5. Create a new line that acts as a proxy line for manager in partition ptinternal and CSS as cssmanager.

Association Information	
1	Line [1] - 8892 in PT_INTERNAL
2	Line [2] - 8893 in PT_INTERNAL
3	Line [3] - 8894 in PT_INTERNAL
4	Hunt Group Logout
5	test1@cisco.com
6	testnew@cisco.co.uk
7	Meet Me Conference
8	Add a new SD
----- Add On Module(s) -----	
9	Add a new SD
10	None
11	None
12	None
13	None

Phone Type	
Product Type:	Cisco 7975
Device Protocol:	SCCP

Device Information	
Registration	Registered with Cisco Unified Communications Manager 10.127.227.117
IP Address	10.127.227.94
Active Load ID	SCCP75.9-4-2-1S
Download Status	Unknown
<input checked="" type="checkbox"/> Device is Active	
<input checked="" type="checkbox"/> Device is trusted	
MAC Address*	00083031ED49
Description	Auto 8892
Device Pool*	Default <a href="#">View Details</a>
Common Device Configuration	< None > <a href="#">View Details</a>
Phone Button Template*	SEP00083031ED49-SCCP-Individual Template
Softkey Template	Standard Assistant
Common Phone Profile*	Standard Common Phone Profile

6. Navigate to **Related Links > Subscriber/Unsubscriber Services** and subscribe IPMA service for this phone.



Subscribed Cisco IP Phone Services for SEP00083031ED49 - Mozilla Firefox

https://10.127.227.117/ccmadmin/ipphoneServiceSubscribeEdit.do?device=d8eea220-0

Subscribed Cisco IP Phone Services for SEP00083031ED49

Next Help

Status: Ready

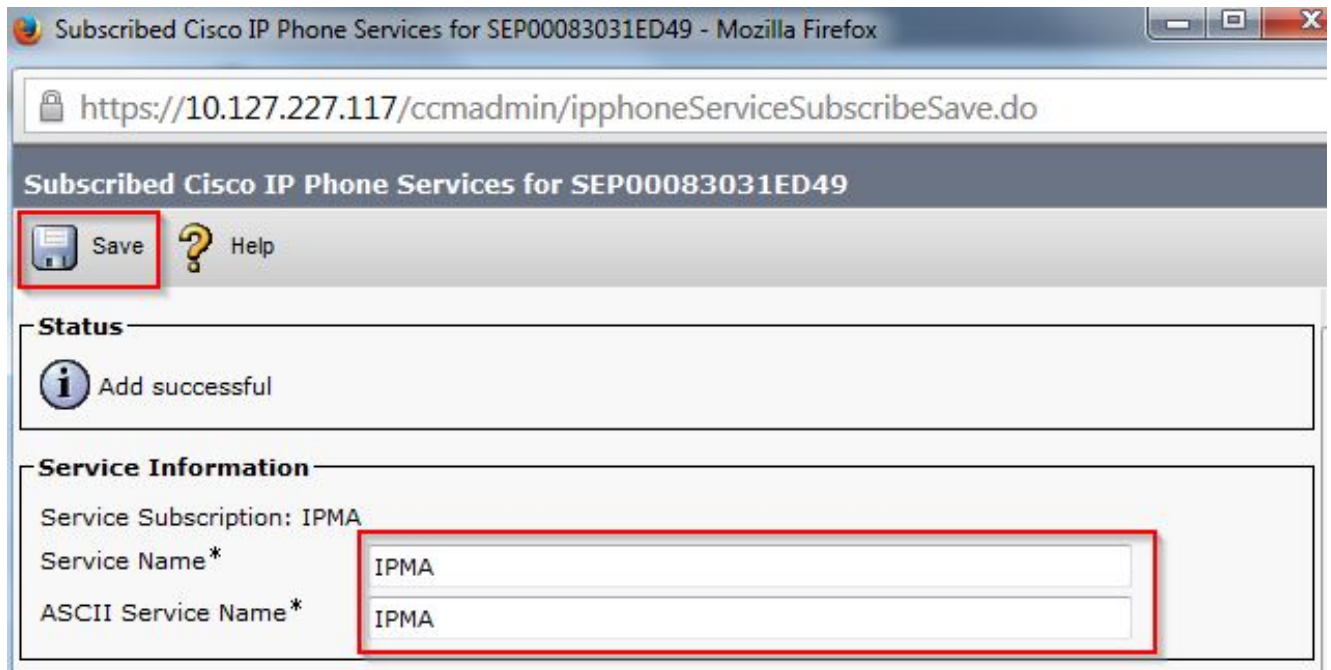
Service Information

Service Subscription: New

Select a Service\* IPMA

Service Description

Primary



## Step 4. Configure Manager Phone

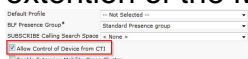
1. Log in to the CUCM Administration web GUI.
2. Navigate to **Device > Phone > Phone configuration page** (Manager Phone).
3. Select the softkey template to Standard Manager.
4. Create a new line as a primary DN of Manager in partition ptmanager and CSS as cssmanager.
5. Navigate to **Related Links > Subscriber/Unsubscriber Services** and subscribe IPMA service for this phone.

## Step 5. Configure Manager Enduser

1. Log in to the CUCM Administration web GUI.
2. Navigate to **User Management > End User**.
3. Create a new user Manager with appropriate credentials and details.
4. Associate the Manager phone to this user from **Device Association** tab.



5. Check the **Allow Control of Device from CTI** check box and Assign/Select the primary extension of the Manager as shown in this image.



6. Navigate to the bottom of the page and select Add to Access Control Group and assign all CTI roles here as per requirement.
7. Navigate to the **Related Links section > Manager Configuration > Go**
8. Uncheck the **Automatic Configuration** check box and select the Phone device name for manager.
9. Choose the assistant you want to associate with this manager. (You can associate more than one assistant if needed)
10. Choose the lines that you need to be controlled by IPMA service over CTI and click **Save**.

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾

### Cisco Unified CM Assistant - Manager Configuration

Save Delete

---

**Manager Information**

Mobile Manager

Uses Shared Lines

Device Name/Profile\* SEPF02929E2D831 ▾

Intercom Line <None> ▾

---

**Assistant Information**

Available Assistants cisco, cisco1  
cisco2, cisco2  
ciscotac, ciscotac  
tacmaster, tacmaster ▾

▼ ▲

Associated Assistants\* Assistant, Assistant ▾

[View Details](#)

---

**Controlled Lines**

Available Lines line 2 - 8884 - PT\_MANAGER ▾

▼ ▲

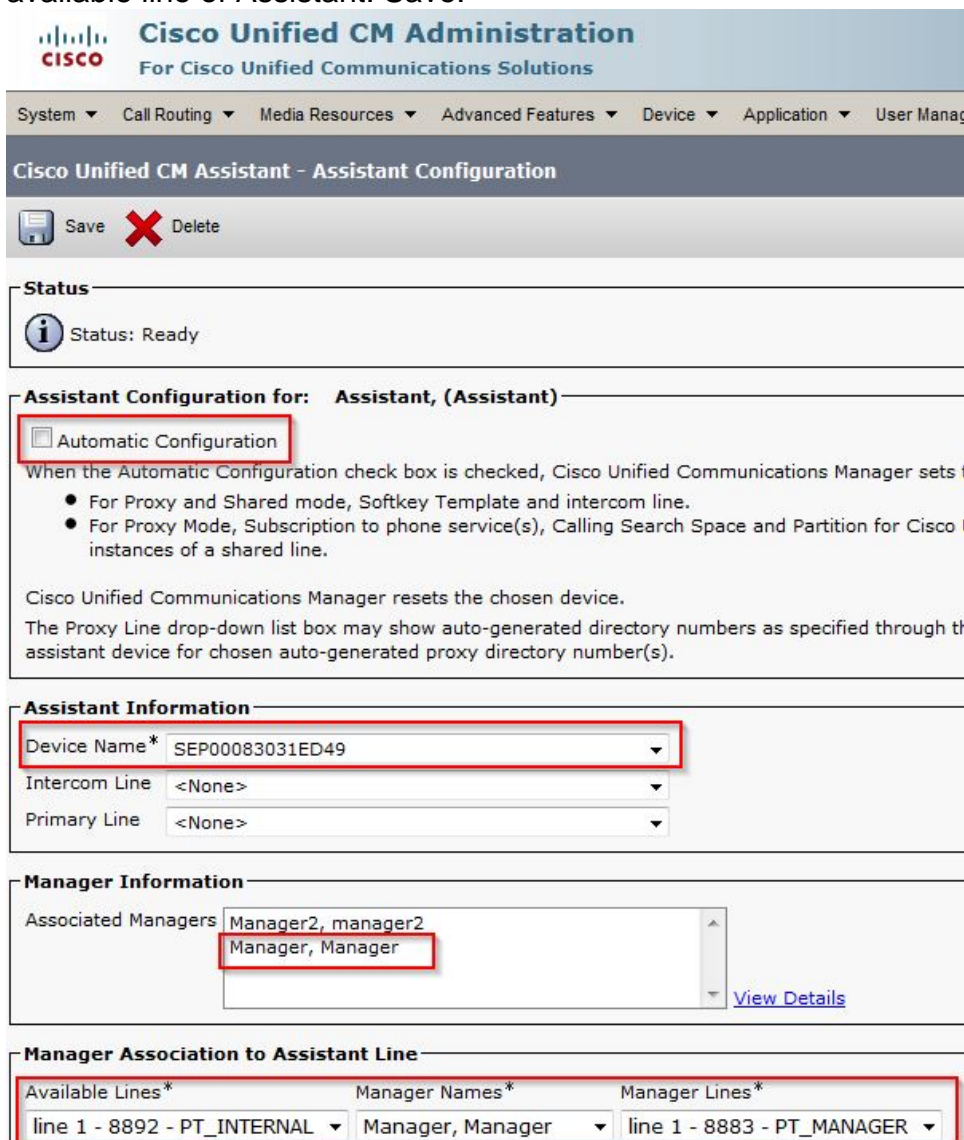
Selected Lines\* line 1 - 8883 - PT\_MANAGER ▾

▼ ▲

11. Navigate to the Manager phone device page and associate the Manager user here.

## Step 6. Configure Assistant Enduser

1. Log in to the CUCM Administration web GUI.
2. Navigate to **User Management > End User**.
3. Create a new user Assistant with appropriate credentials and details.
4. Associate the Assistant phone to this user from **Device Association** tab.
5. Check the **Allow Control of Device from CTI** check box and Assign/Select the primary extension of the Assistant..
6. Navigate to the page bottom and select **Add to Access Control Group** and assign all CTI roles here as per requirement.
7. Navigate to the **Related Links section > Assistant Configuration > Go**.
8. Uncheck the box for Automatic Configuration and select the Phone device name for Assistant.
9. In the Associate Manager's box, all the Managers with whom this Assistant was associated, are listed out.
10. In Manager Association to Assistant Line, choose any Available Line from assistant that you want to associate with any particular manager. Choose the Manager name for this line you want to associate. Choose the Manager line number which you want to associate with the available line of Assistant. Save.



The screenshot shows the Cisco Unified CM Administration web interface for configuring an Assistant. The page title is "Cisco Unified CM Assistant - Assistant Configuration". The navigation menu includes System, Call Routing, Media Resources, Advanced Features, Device, Application, and User Management. The page contains several sections:

- Status:** Shows "Status: Ready".
- Assistant Configuration for: Assistant, (Assistant):**
  - An unchecked checkbox for "Automatic Configuration" is highlighted with a red box. Below it, text explains that when checked, the manager sets various parameters like Softkey Template, intercom line, and Calling Search Space.
  - Text below states: "Cisco Unified Communications Manager resets the chosen device. The Proxy Line drop-down list box may show auto-generated directory numbers as specified through the assistant device for chosen auto-generated proxy directory number(s)."
- Assistant Information:**
  - "Device Name\*" dropdown is set to "SEP00083031ED49" and is highlighted with a red box.
  - "Intercom Line" dropdown is set to "<None>".
  - "Primary Line" dropdown is set to "<None>".
- Manager Information:**
  - "Associated Managers" list box contains "Manager2, manager2" and "Manager, Manager". The latter is highlighted with a red box.
  - A "View Details" link is present.
- Manager Association to Assistant Line:**
  - A table with three columns: "Available Lines\*", "Manager Names\*", and "Manager Lines\*".
  - The first row is highlighted with a red box and contains: "line 1 - 8892 - PT\_INTERNAL", "Manager, Manager", and "line 1 - 8883 - PT\_MANAGER".

## Step 7. Configure CTI Route Point

1. Log in to the CUCM Administration web GUI.
2. Navigate to **Device > CTI Route Point > Add New**.
3. Provide any name and details as required.
4. Add a new DN to this CTI Route Point which should match the Manager's DN. In case of more than one manager, the DN should be such that it matches the DNs of all managers (such as 50XX which uses wildcard characters).
5. Assign the partition as ptinternal to it and CSS as cssmanager as it should be reachable to all Manager DN's.

The screenshot displays the Cisco Unified CM Administration web interface for configuring a CTI Route Point. The breadcrumb navigation shows: System > Call Routing > Media Resources > Advanced Features > Device > Application > User Management > CTI Route Point Configuration.

**CTI Route Point Configuration**

Save  Delete  Copy  Reset  Apply Config  Add New

**Status**

**Status:** Ready

**Device Information**

Registration	Registered with Cisco Unified Communications Manager 10.127.227.117
IP Address	10.127.227.117
<input checked="" type="checkbox"/> Device is trusted	
Device Name*	<input type="text" value="IPMA_RP"/>
Description	<input type="text" value="IPMA_RP"/>
Device Pool*	Default <a href="#">View Details</a>
Common Device Configuration	< None > <a href="#">View Details</a>
Calling Search Space	< None >
Location*	Hub_None
User Locale	< None >
Media Resource Group List	< None >
Network Hold MOH Audio Source	< None >
User Hold MOH Audio Source	< None >
Use Trusted Relay Point*	Default
Calling Party Transformation CSS	< None >
Geolocation	< None >

Use Device Pool Calling Party Transformation CSS

**Association Information**

- 7718 Line [1] - 8888 in PT\_INTERNAL
- 7719
- 7718 Line [2] - 8883 in PT\_INTERNAL
- 7719



## Step 8. Configure IPMA Service Parameter

1. Log in to the CUCM Administration web GUI.
2. Navigate to **System > Service Parameters**.
3. Select the **Call Manager server > Cisco IP Manager Assistant**.
4. Set the primary CTI Manager and primary IPMA server IP address.
5. Set the Route Point name being used for IPMA
6. Rest all the parameters you can keep default and as per the configuration done in the cluster.

The screenshot shows the Cisco Unified CM Administration interface for configuring the Cisco IP Manager Assistant service parameters. The page is titled "Service Parameter Configuration" and includes navigation tabs for System, Call Routing, Media Resources, Advanced Features, Device, Application, User Management, Bulk Administration, and Help. The status is "Ready".

**Select Server and Service**

Server\*: 10.127.227.117 (Active)  
 Service\*: Cisco IP Manager Assistant (Active)

All parameters apply only to the current server except parameters that are in the cluster-wide group(s).

**Cisco IP Manager Assistant (Active) Parameters on server 10.127.227.117 (Active)**

Parameter Name	Parameter Value
<a href="#">CTIManager (Primary) IP Address</a> *	10.127.227.117
<a href="#">CTIManager (Backup) IP Address</a>	
<a href="#">Route Point Device Name for Proxy Mode</a>	IPMA_RP
<a href="#">CAPF Profile Instance ID for Secure Connection to CTIManager</a>	< None >

**Clusterwide Parameters (Parameters that apply to all servers)**

<a href="#">Cisco IPMA Server (Primary) IP Address</a> *	10.127.227.117
<a href="#">Cisco IPMA Server (Backup) IP Address</a>	
<a href="#">Cisco IPMA Server Port</a> *	2912
<a href="#">Cisco IPMA Assistant Console Heartbeat Interval</a> *	30
<a href="#">Cisco IPMA Assistant Console Request Timeout</a> *	30
<a href="#">Cisco IPMA RNA Forward Calls</a> *	False
<a href="#">Alpha Numeric UserID</a> *	True
<a href="#">Cisco IPMA RNA Timeout</a> *	10
<a href="#">CTIManager Connection Security Flag</a> *	Non Secure
<a href="#">Redirect call to Manager upon failure to reach Assistant</a> *	False

**Clusterwide Parameters (Softkey Templates)**

<a href="#">Assistant Softkey Template</a>	Standard Assistant
<a href="#">Manager Softkey Template for Proxy Mode</a>	Standard Manager
<a href="#">Manager Softkey Template for Shared Mode</a>	Standard Shared Mode Manager

**Clusterwide Parameters (IPMA Device Configuration Defaults for Proxy Mode)**

<a href="#">Manager Partition</a>	ptmanager
<a href="#">All User Partition</a>	ptinternal
<a href="#">IPMA Calling Search Space</a>	cssdefault
<a href="#">Manager Calling Search Space</a>	cssmanager
<a href="#">Cisco IPMA Primary Phone Service</a>	< None >
<a href="#">Cisco IPMA Secondary Phone Service</a>	< None >

- If you have configured more than one IPMA servers in the cluster, specify the IPMA server service that you want to use as primary on in Cisco IPMA Primary Phone Service and other as Secondary. For IPMA, local server can be configured as the CTI Server (recommended).

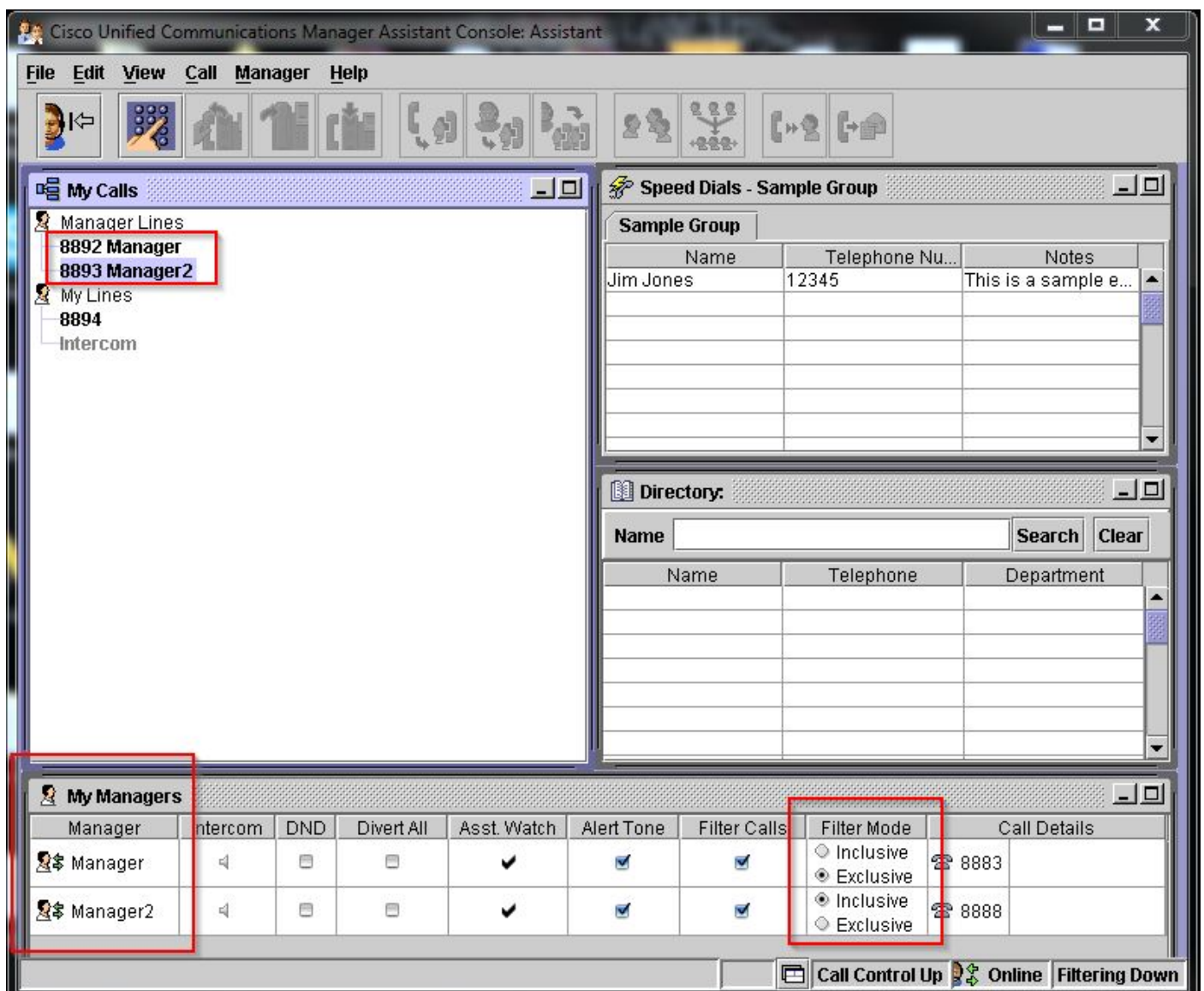
## Step 9. Cisco Unified Communication Manager Assistant Console

This is an application designed as an additional feature to the Assistant's that enables them to use all the Assistant phone features through the application (Assistant Console). The complete assistant phone is controlled via CUCM Assistant Console. The assistant can install the assistant console, a client-server java application, on a PC that runs Windows 2000, Windows XP, Windows Vista or Windows 7. The assistant console connects to the CUCM (IPMA) Service for login and directory services. Multiple assistant consoles can connect to a single CUCM IPMA Service.

To download this application:

- Log into the CUCM Administration web GUI.
- Navigate to **Application > Plugins > Cisco Unified CM Assistant Console** (download).

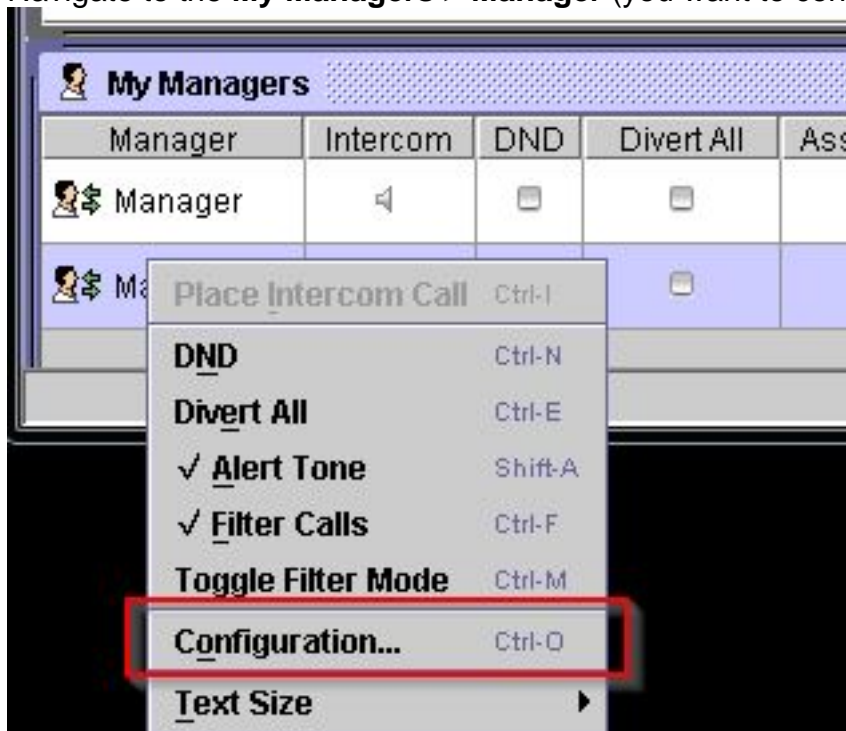
Once installed, the interface after configurations looks as shown in this image.



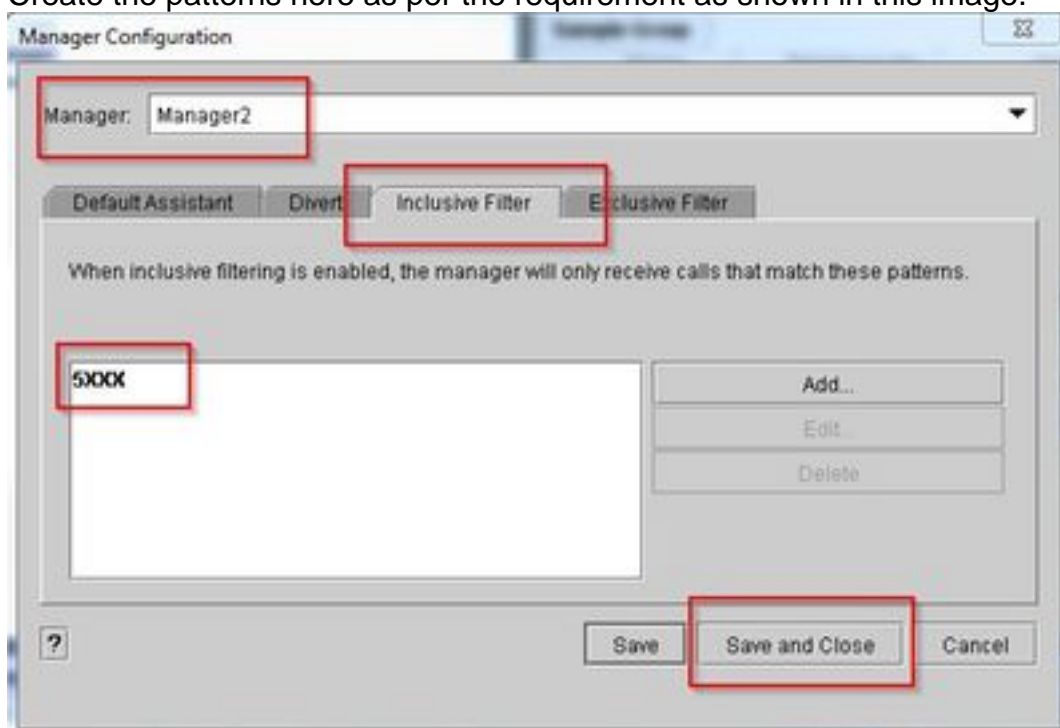
One additional feature that you can use exclusively through Assistant Console is Inclusive/Exclusive filtering of calls. When the inclusive filtering is enabled and filter mode is set to ON, Manager can still receive the calls from the numbers that match the patterns in this configuration. When exclusive filtering is enabled, filter ON/OFF would not make any difference, however, Manager would not receive the calls from the numbers which match the patterns in this configuration.

To configure these filters:

1. Log in to the CUCM Assistant Console.
2. Navigate to the **My Managers > Manager** (you want to configure) > **Configuration**.



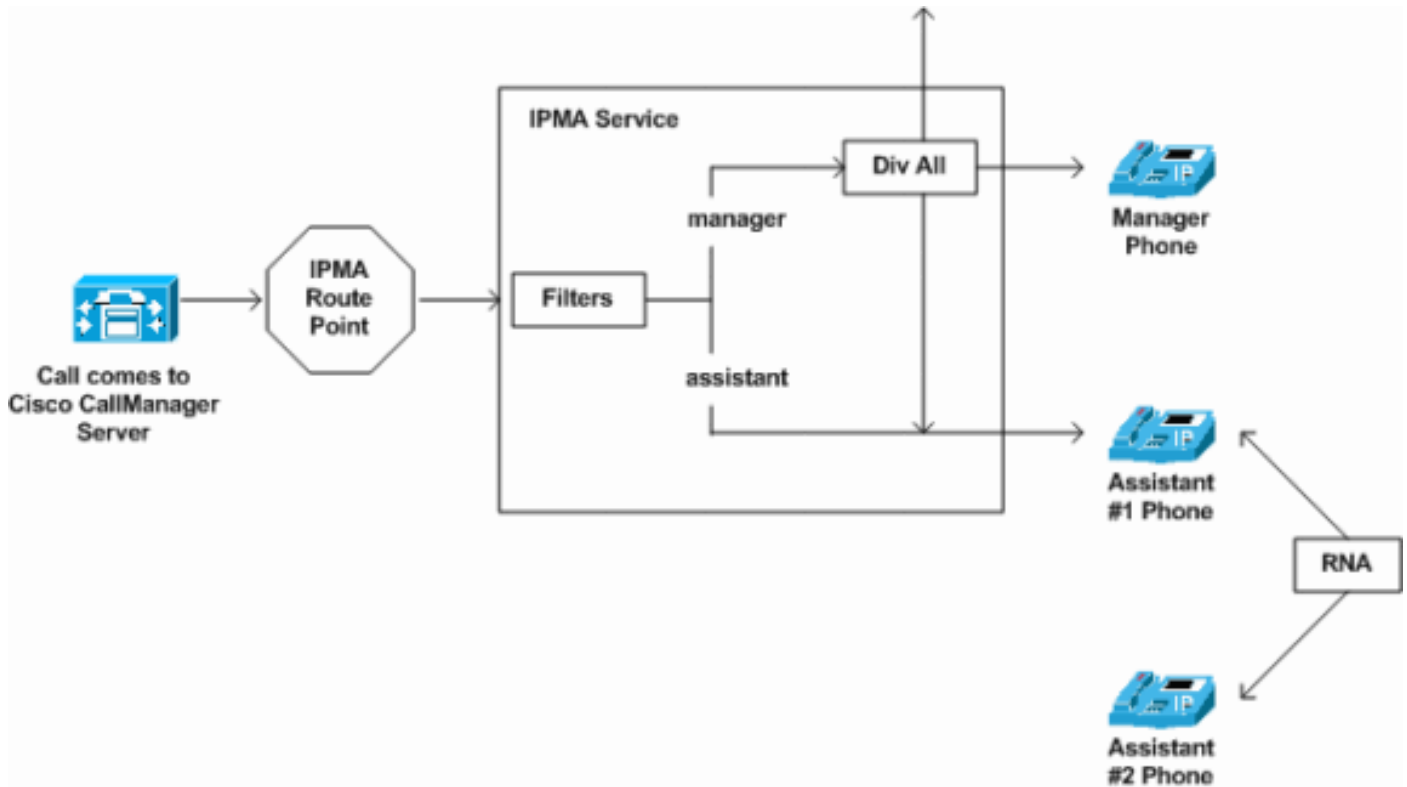
3. Create the patterns here as per the requirement as shown in this image.



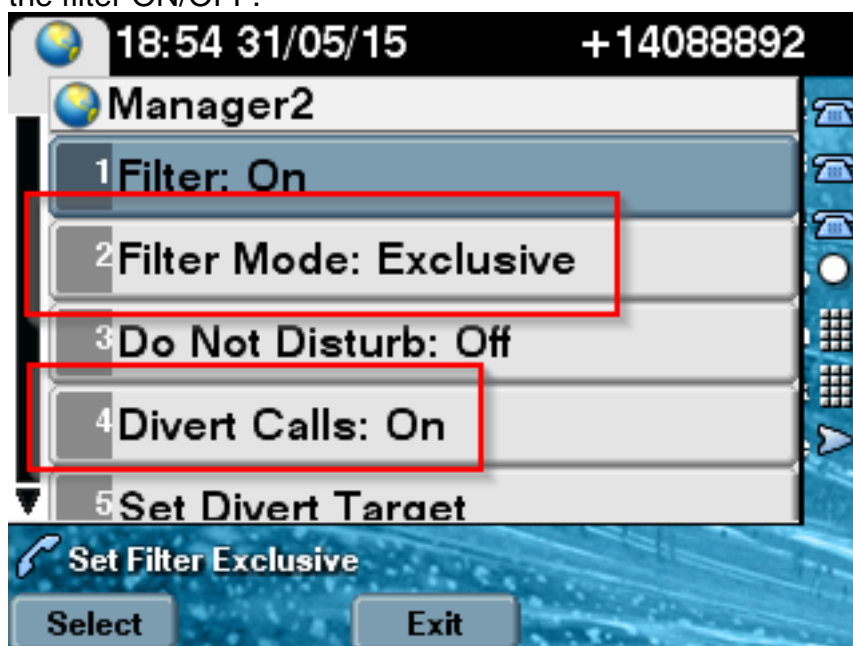
**Note:** This illustrated configuration is for the basic IPMA functions. Based on the requirement, speed dials, intercom and additional lines can be added to Manager/Assistant phones.

## Network Diagram

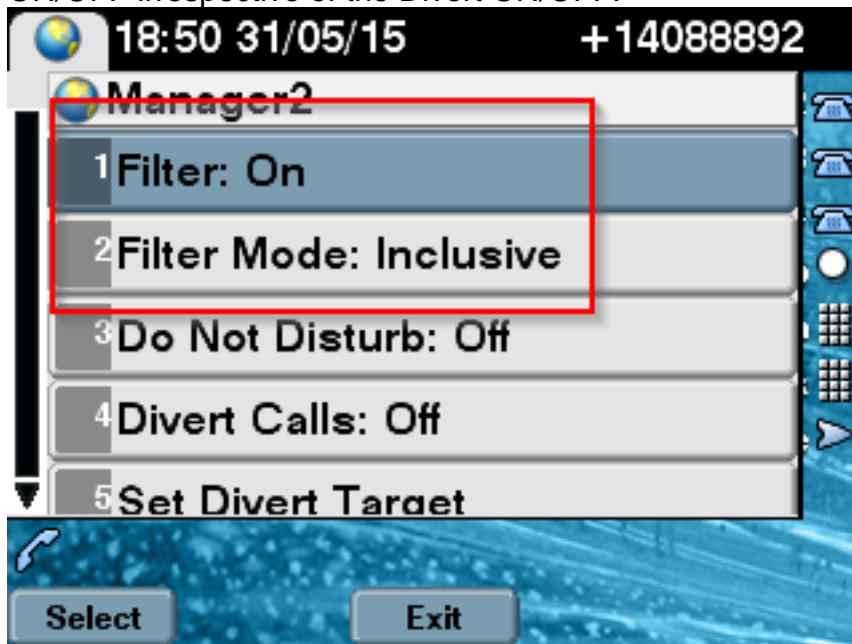
This image illustrates the complete basic flowchart for the working of IPMA.



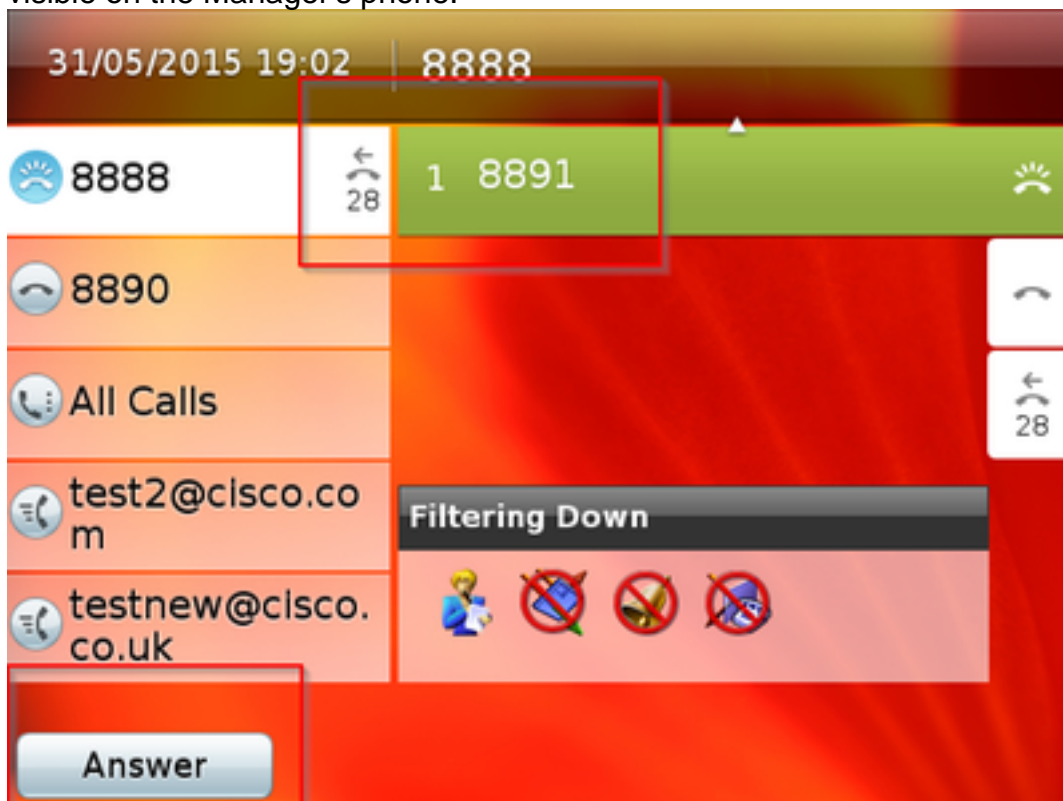
1. If the filter mode is set to Exclusive, all the calls are diverted to the divert target irrespective of the filter ON/OFF.



2. If the filter mode is set to Inclusive, all the calls are filtered to Manager/Assistant based on ON/OFF irrespective of the Divert ON/OFF.



3. If **Do Not Disturb** option is turned on, based on the filter settings calls can still be diverted to Manager, however, the phone would not ring. Only the visual alerts with call information is visible on the Manager's phone.



4. As per the design, if the phone was failover to the secondary server, it would not go back to the primary again even if it becomes active, until the secondary is down.

5. If in case IPMA service is down, Call Forward No Answer (CFNA) can be configured for Manager's DN so as to avoid dropping of calls and keep them going.
6. CTI Route points are not needed while using IPMA in shared line mode.

## Verify

1. Check if the IPMA service is accessible from the Manager and Assistant Phones.
2. IPMA icons (Assistant Watch Window) and softkeys must appear on the Manager phones.
3. Check if the call gets routed to assistant phone when Manager's DN is dialled and filter is set to ON.
4. Install Cisco Unified Communication Manager Assistant Console and log in as Assistant here. Try to set the IPMA filter's and call routing to check if it works fine.
5. Turn off the IPMA service on primary server to check if the IPMA failover works as expected. (Even if the Cisco Tomcat service is down on the server, IPMA will failover)

## Troubleshoot

### IP Phone support for IPMA

To start with, it is essential to verify and check on what all protocols the IP Phone supports the IPMA feature.

1. Log in to the Cisco Unified Reporting page.
2. Navigate to **System Reports > Unified CM Phone Feature List**
3. Click the Unified CM Phone Feature List hyperlink under the Report Name to navigate to query page.
4. Select the IP Phone model in the Product list and Feature as IPMA. for example, if the IP Phone supports this feature for SIP protocol then the output would be displayed as shown in this image.

The screenshot shows the Cisco Unified Reporting interface. The main content area displays the 'Unified CM Phone Feature List' report. The report title is 'Unified CM Phone Feature List' and it provides a complete list of features available to products supported by Unified CM. The report was created on Sun May 31 04:50:30 PDT 2015. The report includes a search form with 'Product' set to 'Cisco 9971' and 'Feature' set to 'IPMA'. Below the search form, the 'Unified CM Cluster Name' is shown as 'Hubcluster' with 'Publisher Name/IP' as 'CUCM9xPub'. The 'List Features' table is as follows:

Product	Protocol	Feature	Parameters
Cisco 9971	SIP	IPMA	

Else all the rows will be blank in the table if the phone does not support IPMA on any protocol.

## Common Checkpoints to troubleshoot

- If receiving any kind of HTTP errors on phone while accessing the IPMA service, please recheck the Phone URL configured in the Phone Service configuration on CUCM. Here is the generic URL:  
http://<CUCM-Server-IP>:8080/ma/servlet/MAService?cmd=doPhoneService&Name=#DEVICENAME#
- Verify the exact IP address of the primary and secondary IPMA/CTI servers in the service parameter list of all the servers. (Incorrect config might result in CTI Route point unregistering frequently or IPMA icons being disappeared on the phones)
- Cross-verify if all the Manager/Assistant phones have subscribed to IPMA service.
- For any kind of issues arising after any kind of change in the IPMA configuration, good practise is to restart these services:
  - Cisco IPMA
  - Cisco Tomcat
  - Cisco CTIManager
- For any related network issues for IPMA, by default port assigned for IPMA server communication is 2912. Verify is this is allowed on all the devices in between CUCM and IP Phone.
- While using the shared line mode, **Uses Shared Lines** option must be checked in the Manager configuration.
- If the issue still persists, please collect the below traces from Real Time Monitoring Tool (RTMT) and open a TAC case with them attached:
  - Cisco IPMA
  - Cisco CTIManager
  - Cisco CallManager
  - Cisco Tomcat(Please make sure you provide the user, IP Phone and cluster details with them)

## Common Cisco bug IDs

[CSCtg21509](#) & [CSCup52338](#): IPMA **File not Found** error on the IP Phones. (Reconfigure the Manager/Assistant configuration)

[CSCuq44874](#), [CSCud90278](#) & [CSCud11654](#): IPMA Failover issues, if primary goes not it does not fallback to secondary.

[CSCte60089](#): IPMA **Host not Found** error on the IP Phones.

[CSCun74352](#): IPMA Vulnerability (that could allow an unauthenticated, remote attacker to access sensitive information on the affected device)

## **Related Links**

[Cisco Unified Communications Manager Assistant with Proxy Line Support](#)

[Cisco Unified Communications Manager Assistant with Shared Line Support](#)

[Common IPMA Troubleshooting](#)