14. IM and Presence

CM-IMP

CM-IMP (cisco Communications Manager IM and Presence server)—Tightly integrated with cucm. Extends the presence capabilities native to cucm (off-hook status of a phone).

- Available, Busy, Away on multiple devices
- Calendar status
- Instant Message within & beyond company, including Group Chat, Persistent Chat, with compliance features like logging and history

SIP (Session Initiation Protocol)—Used by cm-imp

SIMPLE (Sip for Instant Messaging and Presence Leveraging Extensions—Used by cm-imp

XMPP (eXtensible Messaging and Presence Protocol)—Used by cm-imp

JABBER

Application providing a single interface for most-used communications tools. Successor to Personal Communicator (CUPC).

- Can control a desk phone to initiate calls.
- Has a softphone mode
- Lists contacts with their enhanced Presence status. Click to initiate phone call, video call, chat, group chat, or collaboration interaction
- Chat uses the Jabber XCP (eXtensible Communications Platform) with xmpp as the chat protocol

Operating Modes

- Deskphone Mode—to control the phone, it must be registered with cucm and associated with the user. Uses CTIQBE (Computer Telephone Integration Quick Buffer Encoding) to control the ip phone
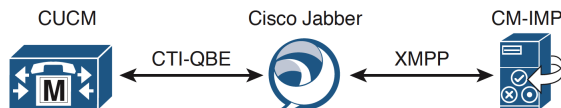
- Softphone Mode—When the ip phone isn't available or the user is away from the desk, Jabber activates the associated softphone based on the csf.
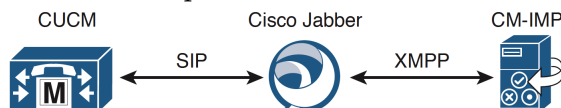
CSF (cisco unified Client Services Framework)—To enable the above, admin creates the csf device, which registers the softphone with cucm as a sip device. Csf is described at the end of this section.

Instant Messaging—Chat, Group Chat, Ad-Hoc Group Chat (sessions stored in memory on the cm-imp server), and Persistent Chat, which continues even when all participants have left.

- TLS-secured (Transport Layer Security)
- Persistent Chat requires an external database to store the rooms and conversations
- Offline IM—messages can be sent to users who are currently offline by storing them in the local IDS database on the cm-imp server
- IM Forking—Jabber xcp has been customized to route messages to all devices with a non-negative priority (not blocked from receiving) instead of just the highest priority device. Once a user replies from a device, that device gets all subsequent messages, exclusively
- An IM gateway provides backward compatibility for sip-only Presence clients, e.g. cupc 7.x

Voice—supported in deskphone or softphone mode

- SRTP (Secure Real-Time Protocol)—Voice encryption supported
- SRST (Survivable Remote Site Telephony) supported in softphone mode with cucm/csf configuration
- Codecs Supported by Jabber in softphone mode (deskphone mode depends on the phone): G.711 a-law & μ-law, G.722 G.722.1 , and G.729a

Video Calls

- Deskphone Mode
  - CAST (Cisco Audio Session Tunnel) and cdp handle communication between the phone and the computer running Jabber . Cast doesn't support sip phones.
  - Deskphone must be enabled for video support in cucm.
- Softphone Mode—Jabber uses the csf device configured on cucm for video calls. Csf devices are video-enabled by default.
- Video Conferencing is supported using a video-conference bridge accessible by the MRGL (Media Resource Group List) assigned to the ip phone or csf device.

Integration

- Jabber can access visual and normal voicemail on Unity Connection. Users can manage their mailboxes and listen to, send, and delete messages.
- Click-to-call supported from Jabber, Outlook, Word, & Excel.
- Outlook can view Presence indicators of contacts
- With Cisco Unified MeetingPlace integrated, a Jabber call can easily become a conference

CSF (Cisco Unified Client Services Framework)—The foundation of all client software for Unified Communications.

- Part of Jabber and extends MS Outlook and WebEx Connect
- Core Functionality is voice, video, secure communication with cucm, and communication with IM (texting) servers like cm-imp
- Provides audio & video call control & advanced features like visual voicemail support
- Only one csf client can be installed at once on a client pc, e.g. Jabber and Cisco Unified Communications Integration for Microsoft Office Communicator can't coexist.

CCMCIP (Cisco unified Communication Manager IP Phone service)

- Originally provided authentication, directory services and help for end-users
- Since adapted to provide Jabber and csf clients with a list of devices where a user can be reached when they log in
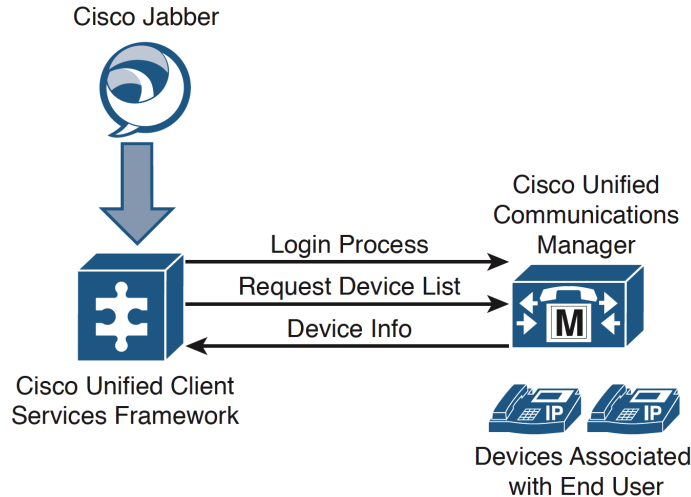
Configure End Users in CUCM — Give the user the ability to control a deskphone

(Admin) User Management → End User (and choose a user)
- In the "Device Information" section, click [Device Association] button and select the user's IP phone so it appears in the "Controlled Devices" pane
- Make sure the device's config page has "Allow Control of Devices from CTI" (checkbox) checked (true by default). Without this, the user can't control the desk phone while using Jabber and can't make any calls
- If the user uses Extension Mobility, move the appropriate device profile to the "CTI Controlled Device Profiles" pane
- Add user to whichever groups are needed to make their phone(s) work:

Phone Type	Add User to Group
All IP Phones	Standard CTI Enabled Group
+ Extra for 69xx Phones	Standard CTI Allow Control of Phones supporting Rollover Mode
+ Extra for 89xx & 99xx	Standard CTI Allow Control of Phones Supporting Connected Xfer and conf

Associate the DNs with the End Users in CUCM

(Admin) Device → Phone
- Select the user's phone & select "Allow Control of Device from CTI" checkbox under Directory Number Configuration (mentioned when we configured user, above)
- If using extension mobility, click the same checkbox on the user's Device Profile config page

- Scroll down to "Users Associated with Line" section & click the button [Associate End Users], select the user associated with the DN, click [Add Selected], click [Apply Config]

Create a Cisco Unified CSF Device—set up Jabber in softphone mode

(Admin) Device → Phone [Add New]
- Set phone type to "Cisco Unified Client Services Framework" (CSF). CSF names can be up to 15 letters & numbers.
- Set the device pool, owner user ID , and anything else you want
- Select the checkbox "Allow Control of Device from CTI" (even though it's a softphone)
- Select a device security profile and a SIP profile-type, then [Save]
- Under Association, select "Line [1]" and give the softphone (CSF device) the same DN as the user's primary IP phone. Double-check that the user is associated with the line

Associate the CSF Device with the End User in CUCM—On the End User configuration page, under the "Device Information" section, add the newly created CSF device to the Controlled Devices list by clicking the Device Association button. Click [Save].

CONFIGURING CUCM FOR JABBER USERS

Jabber is tightly integrated with CUCM and CM-IMP. Several UC services must be built on the CUCM server to support Jabber features like accessing voicemail messages, deskphone control mode, LDAP directory lookups, and CCMCIP-based user device info. Configure whichever features you choose from the list that follows. These configurations happen in CUCM because Jabber is (kind of) a phone that learns of and how to use its features from CUCM, including how to reach non-CUCM resources, like LDAP.

Later, you'll collect all these services into a service profile that you create. That profile can be assigned to a user. When that user logs into Jabber, all of these configs go along.

Access personal voicemail using Jabber—After you configure the CUC (Cisco Unity Connection) server to serve up voicemails using IMAP (Author claims this was dicussed in Chap 13; I can't find it) you need to configure two things in CUCM.

Define the Mailstore in CUCM

(Admin) User Management → User Settings → UC Service [Add New]
- From the drop down "UC Service Type," choose the mailstore
- Enter a name & IP or hostname of the CUC server and maybe the port # / protocol [Save]

Define the Voicemail Server

(Admin) User Management → User Settings → UC Service [Add New]
You were already here, just click [Add New] again
- From the drop down "UC Service," choose "Voicemail"
- Select "Unity Connection" for the product
- Enter a name & IP or hostname of the CUC server and maybe the port # / protocol [Save]

Allow Desk Phone Control (by Jabber using CTI)

(Admin) User Management → User Settings → UC Service [Add New]

- Select CTI from the drop-down [next]
- Give a name and address for the CTI server (this is the cucm server), modify port if needed [Save]

Allow LDAP Directory Lookups—Allow Jabber to get a list of click-to-dial users from LDAP

(Admin) User Management → User Settings → UC Service [Add New]
- Select Directory from the drop-down [next]
- Give a name and address for the directory (LDAP) server, modify port if needed [Save]

Define the Presence Server

(Admin) User Management → User Settings → UC Service [Add New]
- Select "Unified CM (IM and Presence)" from the drop-down [next]
- Give a name and address for the cm-imp server [Save]

Create a Service Profile that can be assigned to users, conveying the collection of above services

(Admin) User Management → User Settings → Service Profile [New]
This doesn't show up in my CUCM Menus Hierarchy for CUCM version 9. Check 10.
- Name it and give optional description
- (optional) Check the box "Make This the Default Service Profile for the System." If you do this before synchronizing any users from CUCM, you can avoid manually assigning service profiles to each user.
- Select the UC services that were created above for "Voicemail Profile," "MailStore Profile," "Directory Profile," "IM and Presence Profile," and "CTI Profile"
- For the Directory Profile, specify search base(s) using full LDAP path syntax, e.g. "ou=Users, dc=Pod1, dc=com", just like when LDAP sync was set up (notes page 9-8 near bottom)
- Either specify an account to log into LDAP to search for contacts, or set it to the user's credentials

Manually Associate a User With a Service Profile (Or Modify Choice Later)—Good if you didn't make the above profile the system default

(Admin) User Management → End User
- Enable each user for cm-imp by checking the box in the "Service Settings" section
- (Optional) Check the box "Include Meeting Information in Presence" if you're integrating with a calendaring service like MS Exchange
- Set the correct primary extension # for the user Under the section "Directory Number Associations"

CISCO UNIFIED PRESENCE ARCHITECTURE

CM-IMP is Standards Based

- SIP, SIMPLE, and XMPP to provide generic Presence and federation functionality
- SOAP (Simple Object Access Protocol) to access the cucm database via Cisco Unified Communications System xml and Jabber configuration profiles
- CTIQBE (Computer Telephone Interface Quick Buffer Encoding) integrates Microsoft Office Communicator

Core Components of CM-IMP:

- Jabber XCP—for Presence, IM, contacts listing, message & call routing, policy & federation
- Rich Presence Service—Manages Presence state gathering and Presence-enabled routing
- Group chat storage—ad hoc group chats are stored in memory on the CM-IMP server. Persistent chat and message archiving require an external database k

Microsoft Office Communications Server Integration via SIP—CM-IMP works w/ MS Live Communications Server 2005 or MS Office Communications Server 2007. The MS Office Communicator Client provides click-to-call & deskphone control and Presence capability.

LDAP Integration

- User Presence status can sync with their Outlook/Exchange calendar
- LDAP directory can be searched from the Jabber interface
- CM-IMP can use Outlook Web Access (a web distributed authoring and versioning interface provided by Exchange) to communicate with Exchange
- CM-IMP user database syncs with CUCM, which may sync with LDAP
- User authentication can be outsourced directly to LDAP (single sign-on)

Cisco Unity Connection Integration—From the Jabber interface, a user can sort, view, listen to, and delete voice messages as well as call their sender.

- Presence info of the sender is displayed, helping the user choose how to communicate or escalate to a call, message, or conference.
- IMAP (Internet Message Access Protocol) handles access to the CUC mailbox and requires a voicemail profile on the CM-IMP server
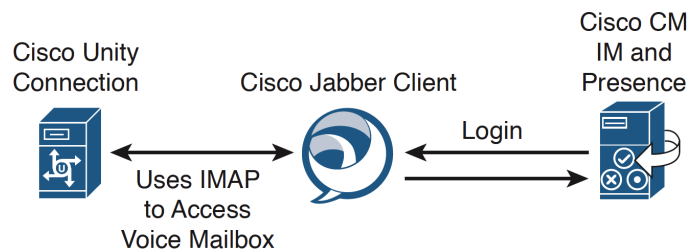

Conferencing Resources Integration—CM-IMP uses WebEx or MeetingPlace for conferencing

- WebEx requires a local Meeting Center server
- Macromedia Flash over HTTP(s) is used for communication to the conferencing server
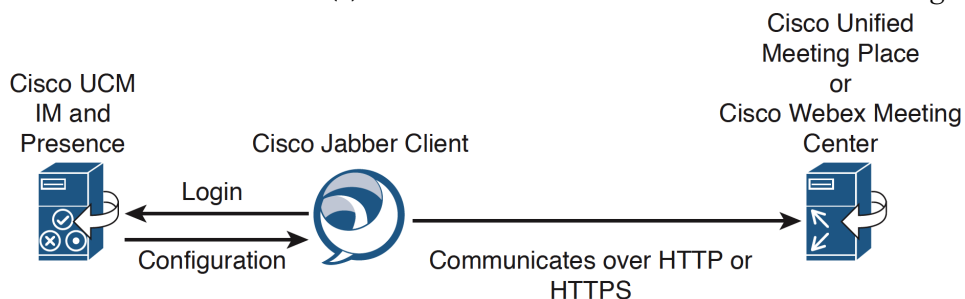
Calendar Integration—Using MS Exchange 2003 or 2007 (requiring Active Directory 2003 or 2008), C M-IMP can provide access to calendar status (Free/Busy/Out of Office) & map it to a Presence status (Available, Busy, Away).

- CM-IMP needs a special Exchange account to inspect user calendars. That account needs membership in the View-Only Administrators Group in Exchange and "Receive-As" permissions on all user mailboxes
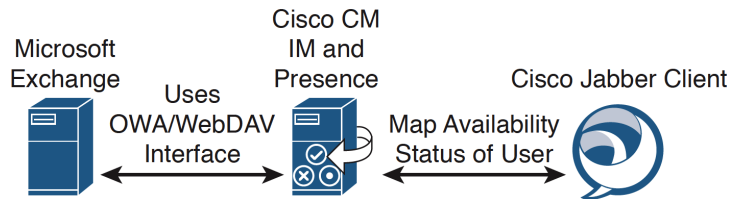
Softphone Mode Architecture & Call Flow—e.g. Softphone mode because user is traveling on a laptop.

- CSF framework registers with CUCM as a CSF device using SIP signaling
- CSF framework downloads the config file from CUCM, obtaining a DN, partition, CSS, device pool, etc.
- Chat features use XMPP, sending all IMs to CM-IMP

Deskphone Control Mode Architecture & Call Flow

- Jabber logs into CUCM (user provides pass)
- CCMCIP service provides Jabber with list of user-associated controlled devices. A user whose account has multiple phones can choose the right one
- Jabber uses CTTIQBE to control the IP phone
- Jabber uses XMPP for chat, sending all IMs to CM-IMP

IM (Ad hoc Chat)

- Chat is a core capability of CM-IMP (with Jabber as its front-end)
- Jabber XCP—protocol used to support a variety of clients from different vendors
- The Jabber desktop client features desktop sharing
- Messages stored in server memory

Persistent Chat (chat rooms)

- Persistent chat needs a separate external database for each CM-IMP server configured for persistent chat. Database instances can be on the same server, but needn't be.
- ODBC (Open DataBase Connectivity) is used to access the PostgreSQL database

IM Preservation for Compliance—CM-IMP can preserve IM chats in a PostgreSQL database

- 3rd party compliance applications can add inline virus scanning and anti-spam
- When a 3rd party package is in use, all IM is routed to the compliance server & breaks when it's down
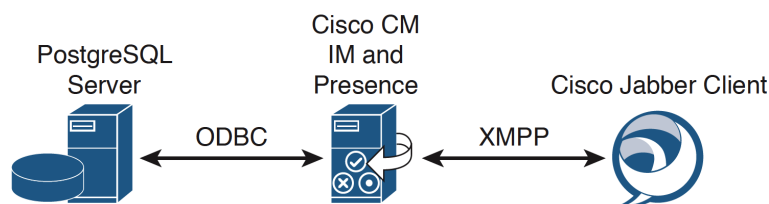
QoS for CM-IMP

- Traffic outbound from a workstation is correctly marked as voice, video, and signaling
- Normally, the first switch won't trust a workstation's QoS marks and will re-mark as low
- Solution is to specify Jabber port ranges and desired QoS markings for that traffic
- To work, the switch (or router, etc.) must be able to classify & mark based on port and forward the traffic to specific destination addresses with appropriate bandwidth and delay guarantees
- Remotely possible that the workstation's OS is unable to mark QoS outbound; unlikely
- Jabber outbound traffic ports:

PORT	TCP	UDP	PROTOCOL	DESCRIPTION
69		X		TFTP
80 + 443	X		HTTP + HTTPS	Jabber connects to services like Cisco Unified MeetingPlace for meetings + Cisco Unity Connection for voicemail features
143	X		IMAP (TLS)	Jabber connects to Cisco Unity Connection to retrieve & manage the user's list of voice messages & the messages themselves
389	X			Connects to LDAP for contact searches
636			LDAPS	Connects to LDAP for contact searches (securely)
993			IMAP (SSL)	Jabber connects to Cisco Unity Connection to retrieve & manage the user's list of voice messages & the messages themselves
2748	X			CTI gateway, which is the CTIManager component of CUCM
5060	X	X		SIP call signaling
5061	X	X		SIP call signaling (secure)
5222	X		XMPP	Cisco Unified Presence server for availability status and IM features
7993			IMAP (TLS)	Jabber connects to Cisco Unity Connection to retrieve & manage the list of **secure** voice messages & the messages themselves
8191	X			Connects to local port to provide SOAP web services
8443	X			Connects to CUCM IP Phone (CCMCIP) server to get list of currently assigned devices
16384-32766		X		RTP media streams for audio & video

CONFIGURING PRESENCE SIGNALING FROM CUCM TO CM-IMP

A specialized SIP trunk is needed to communicate real-time off-hook status from CUCM to CM-IMP.

Create a customized SIP Trunk Security Profile in CUCM

(Admin) System → Security → SIP Trunk Security Profile [Find]
- Choose the "Non Secure SIP Trunk Profile"
- Click [Copy] and name the copy, e.g. "CM-IMP Trunk Profile"
- Set "Device Security Mode" to "Non-Secure"
- Incoming Transport Type should already be "TCP+UDP"
- Outgoing Transport Type should be "TCP"

- Enable: "Accept Presence Subscription," "Accept Out-of-Dialog REFER," "Accept Unsolicited Notification," and "Accept Replaces Header"
- [Save]

Create the SIP Trunk in CUCM

(Admin) Device → Trunk [Add New]
- Make the following selections:

TRUNK TYPE	DEVICE PROTOCOL	TRUNK SERVICE TYPE
SIP Trunk	SIP	None

- [Next]
- Name the device, e.g. "CM-IMP-SIP-Trunk"
- Choose a device pool from the drop-down
- Configure the following values in the SIP Information section at the bottom of the window:

DESTINATION ADDRESS	IP or FQDN (Fully Qualified Domain Name) of CM-IMP. If you use an FQDN, it must be in DNS and match the SRV cluster name configured on the CM-IMP node.
DESTINATION PORT	5060
SIP TRUNK SECURITY PROFILE	The name you chose above, e.g. CM-IMP Trunk Profile
SIP PROFILE	Standard SIP Profile

- [Save]

Configure the SIP PUBLISH trunk on CM-IMP

(Cisco Unified CM IM and Presence Administration) Presence → Settings
- At the "CUCM SIP Publish Trunk" drop-down, select the name you created above, e.g. "CM-IMP-SIP-Trunk"
- [Save]

ENABLING JABBER END-USERS IN CM-IMP

On the CM-IMP server, we need to configure a SIP Publish trunk and define the SIP presence gateway.

On the CM-IMP Admin page (https://<IP> /cupadmin), log in with the Application Administration account, then…

Presence Settings → Standard Configuration
- In the section "Presence Settings," ensure that the "CUCM IM and Presence Publish Trunk" is set to the one you configured on the CUCM server, e.g. "CM-IMP-SIP-Trunk"

Presence → Gateways
- Verify that the CUCM gateway is listed

Symptom	Things to Check
Startup Error "The selected device is not available	• Are the devices registered in CUCM? • Is the end user associated with IP phone in CUCM • Is the CM-IMP profile associated with the user • Can the device and DN be controlled by CTI in CUCM?
User can't make calls using Jabber in softphone mode	• Is the user associated with the CSF device in CUCM? • Is the CSF device registered in CUCM? • Check for correct DN, partition, and CSS
Users are not shown as on the phone during an active call	• Does the SIP trunk between CUCM and CM-IMP exist and is it correctly configured? • Is the user associated with the line? (In CUCM, check IP phone config, Device Profile, or CSF as appropriate)
User cannot log on to Jabber	• Is the user account locked? • Is the server IP address in Jabber correct? (user might have changed it) • If using hostname, is DNS working? • Check the license capabilities assignment in CUCM
User cannot ad contacts, search returns no results	• Is the user associated with the correct LDAP profile? • Is the LDAP Search Context syntax correct
User cannot control the IP phone 9971	• Is the IP phone associated with the user in CUCM? • Is the "Allow Control of Device" box checked on CUCM's device config page? • Is the user a member of both the "Standard CTI Enabled" and "Standard CTI Allow Control of Phones supporting Connected Xfer and Conf" groups