



CallManager 4.0

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Agenda

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- **Call Manager Administration Enhancements**
- **CM Line Enhancements**
- **Routing Enhancements**
- **Protocols support**
- **Video support**
- **CM Apps & Services**

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CallManager Administration

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CallManager Administration

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- [Installation and Backup Enhancements](#)
- [Multilevel Administration Access Enhancements](#)
- [Menu Changes](#)
- [Support for New Cisco IP Phones](#)
- [Additional Media Resources Support](#)
- [Security Enhancements](#)
- [Bulk Administration Tool Enhancements](#)
- [Tool for Auto-Registered Phone Support Enhancements](#)
- [CDR Analysis and Reporting \(CAR\) Enhancements](#)
- [New and Changed Information for Cisco CallManager Serviceability](#)
- [New and Changed Information for Third Party and SDK Applications](#)

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Platforms, Installations & Upgrades

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- **Supported Server Platforms**
 - 7820/22/30/55/65 Server Platforms = Not supported
 - 7815/25/35/45 Server Platforms = Supported
 - ICS-7750 = Supported
 - Certified 3rd-Party Server Platforms = TBD
- **OS CDs**
 - New 78XXH Platforms have DVD drives. OS images come on a single DVD for all three of these new platforms
- **Upgrade Paths**
 - 3.0/3.1 → 4.0 = Not supported
 - 3.2 → 3.3 or 4.0 = Server rebuild
 - 3.3 → 4.0 = Downloadable update

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CallManager Line Enhancements

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CallManager 4.0(1) Line enhancements

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- Multiple calls per line appearance
 - Overcome 3.3 limitation on maximum number of calls per line
- Enhanced call barge
 - Includes cBarge
- Privacy calls on shared lines
- Call join multiple selected calls
- Direct transfer two selected calls
- Immediate Divert-VM
- Assign URL to any line button
- Drop any party from ad-hoc conference
- Configurable call forward info display
- IPMA enhancements



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Product Overview(1)

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Multiple Calls Per Line

- Overcome Seaview limitation on maximum number of calls per line
- Introduce Call Forward Busy Trigger concept to replace original Call Waiting flag
- Configurable Call Forward No Answer (CFNA) timer per line
- Backward compatibility for legacy phones



Only the Cisco IP Phone models 7940 and 7960 support multiple calls on directory numbers in release 4.0(1).

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Configuration (Cont.)

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Duration: (seconds)

Call Pickup Group: <None>

Multilevel Precedence and Preemption Alternate Party Settings

Target (Destination):

Calling Search Space: <None>

No Answer Ring Duration: 14

Line Settings for this Device

	Value
Display (Internal Caller ID)	
Line Text Label	
External Phone Number Mask	
Maximum Number of Calls*	4 (1 - 196)
Busy Trigger*	2 (<= Max. Calls)
Message Waiting Lamp Policy	Use System Policy
Ring Setting (Phone Idle)	Use System Default
Ring Setting (Phone Active)**	Use System Default

Forwarded Call Information Display for this Device

☒ Caller Name ☐ Caller Number

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Product Overview (2)

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New Share Line Appearance behavior

- Allow multiple active calls existing concurrently on different share line devices. But one device can have maximum of one active call at a time
- If one line has active call, user can still work on share line appearance to do hold/resume/answer/new call (if applicable)
- Call Information (cgpn, cdpn, etc.) will be displayed or not on share line appearance call instance (remote-in-use call) based on privacy status



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Examples (1)

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Suppose Device A, B and C share line 1000. Device B has an active call to DN 2000. Device A, B and C have a hold call from DN 2005.

Device A			Device B			Device C		
2	From 2005	Held	1	To 2000	Connected	2	From 2005	Held
1		RemoteInUse	2	From 2005	Held	1		RemoteInUse

Device A and C line 1000 are configured max number of calls as 4. Device B is configured as 2. Device A starts a new call to line 3000.

Device A			Device B			Device C		
3	To 3000	RingOut	1	To 2000	Connected	2	From 2005	Held
2	From 2005	Held	2	From 2005	Held	1		RemoteInUse
1		RemoteInUse				3		RemoteInUse

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Examples (2)

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Suppose Device A, B and C share line 1000. Device B has an active call to DN 2000. Device A, B and C have a hold call from DN 2005.

Device A			Device B			Device C		
2	From 2005	Held	1	To 2000	Connected	2	From 2005	Held
1		RemoteInUse	2	From 2005	Held	1		RemoteInUse

Line 3000 calls share line DN 1000. Max number of calls configuration is the same as previous example. Device A, B has busy trigger 2 and C sets to 3.

Device A			Device B			Device C		
2	From 2005	Held	1	To 2000	Connected	3	From 3000	Ring In
1		RemoteInUse	2	From 2005	Held	2	From 2005	Held
						1		RemoteInUse

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Examples (3)

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Suppose Device A, B and C share line 1000. Device A line 1000 calls 1000.

Shared-line Appearance 1000

Device A			
1		To 1000	RingOut
2			RemoteInUse

Device B			
2		From 1000	RingIn
1			RemoteInUse

Device C			
2		From 1000	RingIn
1			RemoteInUse

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Product Overview(3)

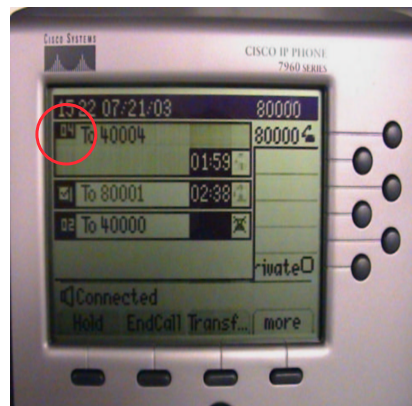
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Call Instance Display

Each call instance on screen contains the

following 4 fields:

- Unique call identifier (1 – 200). This identifier is consistent across all MCD devices with shared-line appearance. It may not be continuous.
- Call select status
- Call information display, such as cgn, cdpn, etc.
- Call state icon.



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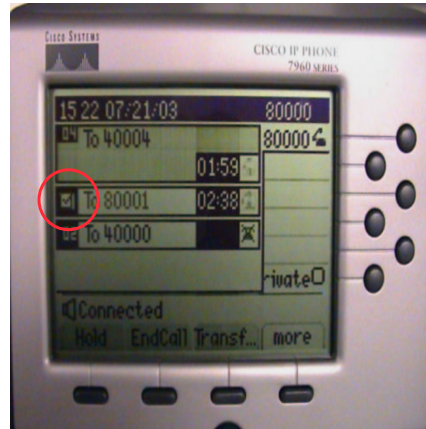
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Product Overview (4)

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Call Select Feature

- Announce call ownership
- Lock/Unlock call for feature pre-processing
- Visible icon on phone display screen
- New “select” softkey for certain call state
- Widely used by many features



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Call Select Feature

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- **How to select/unselect a call**
 1. Press scroll button to view all call instances on a line. Highlight a call instance and hit “select” softkey.
 2. “select” status of a call will toggle. Please see “select” icon on call instance display for current status.
 3. Only active call and hold call can be selected. “select” softkey will not be provided for other call states.

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Call Select Feature (Cont.)

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- **What happened if a call is selected**
 1. **Announce ownership of the call. Other share line appearance can not retrieve this call no matter the call owner hold/resume this call.**
 2. **All calls on share line appearances will show remote-in-use.**
 3. **Call could be automatically selected by CCM in order to fulfill feature requirement, such transfer, conference, etc.**

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Privacy Release

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Allow a user to allow/disallow other users of shared-line devices -

- **To view its call information**
- **To Barge/cBarge into its active calls**

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Privacy Release – cont.

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It is controlled

- **per device based, not DN or call based. Privacy (TRUE/FALSE/DEFAULT)**
- **per system : service parameter – Privacy Setting (TRUE/FALSE)**

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Privacy Feature Button

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Privacy feature can be accessible to the user by configuring Privacy feature button for 7940/7960/7970/7914 button template.

- **Localized label, Privacy, will be displayed**
- **Privacy status will be displayed with lamp on/off accordingly if available.**

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Barge

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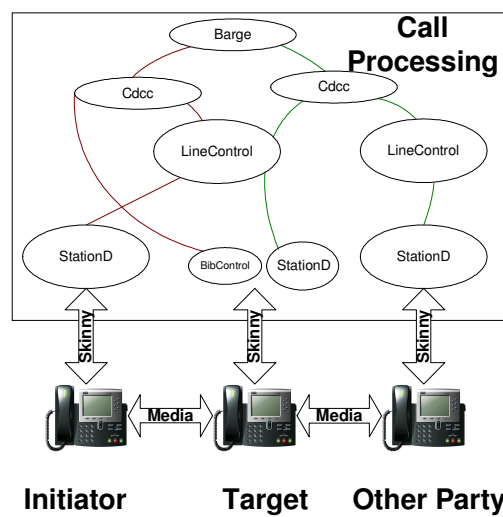
- allow a user to add himself/herself to a remotely active call on a shared line, using the **built-in bridge** at the target device.

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Barge

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Barge – cont.

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- **Target's device must have Built-In Bridge**
- **Target's device must have Built In Bridge enabled**
- **Original call is established using G.711**

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Barge – cont.

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- **When Target releases the original call, Initiator and the Other party will be connected.**
- **When Target holds/transfers/conferences the original call, Initiator will be released.**

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cBarge

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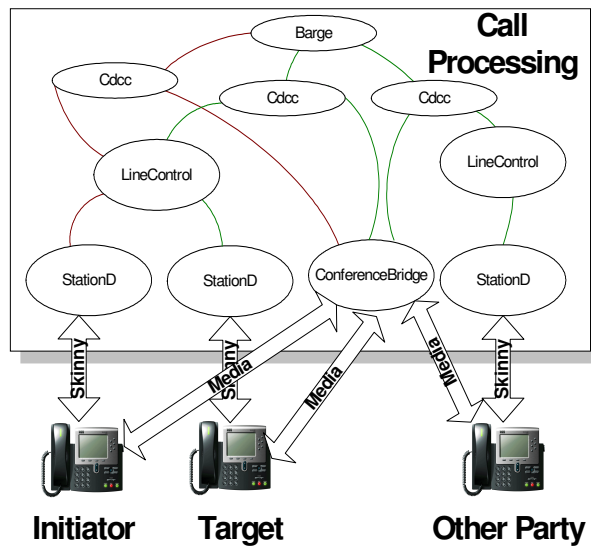
- allow a user to add himself/herself to a remotely active call on a shared line, using the **shared conference bridge**.

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cBarge

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cBarge – cont.

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- Call Info is changed for all parties
- Target is the controller of this conference call
- All codec are supported
- When any party drops, the remaining 2 are connected as basic call

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Device Configuration

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Phone Configuration

[Add/Update Speed Dials](#)
[Subscribe/Unsubscribe Services](#)
[Dependency Records](#)
[Back to Find/List Phones](#)

Directory Numbers	Phone: SEP0002FD3BA568 (Auto 2012) Registration: Unknown IP Address: Status: Ready Copy Update Delete Reset Phone
Line 1 - 2012 (no Partition)	
Phone Configuration (Model = Cisco 7940)	
Device Information	
MAC Address*	0002FD3BA568
Description	Auto 2012
Device Pool*	PubOnly (View details)
Calling Search Space	< None >
AAR Calling Search Space	< None >
Media Resource Group List	< None >
User Hold Audio Source	< None >
Network Hold Audio Source	< None >
Location	< None >
User Locale	< None >
Network Locale	< None >
Built In Bridge	Default
Privacy	Default

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Service Parameter

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Cluster Wide Parameters (Device - Phone)

Parameter Name	Parameter Value	Suggested Value
Always Use Prime Line*	<input type="text" value="False"/>	False
Built-in Bridge Enable*	<input type="text" value="On"/>	Off
Auto Answer Timer (sec)*	<input type="text" value="1"/>	1
Extension Display On 7910 Phone*	<input type="text" value="False"/>	False
Alternate Idle Phone Auto Answer Behavior*	<input type="text" value="False"/>	False
Hold Type*	<input type="text" value="False"/>	False
Line State Update Enabled*	<input type="text" value="True"/>	True
Offhook To First Digit Timer (msec)*	<input type="text" value="15000"/>	15000
Override Auto Answer If DisableSpeaker*	<input type="text" value="True"/>	True
Out Of Bandwidth Text*	<input type="text" value="Not Enough Bandwidth"/>	Not Enough Bandwidth
AAR Network Congestion Re-routing Text*	<input type="text" value="Network Congestion,Rerouting"/>	Network Congestion,Rerouting
Ring Setting of Busy Station*	<input type="text" value="Beep Only"/>	Beep Only
Ring Setting of Idle Station*	<input type="text" value="Ring"/>	Ring
Privacy Setting*	<input type="text" value="True"/>	True

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Service Parameter – cont.

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Cluster Wide Parameters (Feature - General)

Parameter Name	Parameter Value	Suggested Value
Call Park Display Timer (sec)*	<input type="text" value="10"/>	10
Call Park Reversion Timer (sec)*	<input type="text" value="60"/>	60
Party Entrance Tone*	<input type="text" value="True"/>	True
Message Waiting Lamp Policy*	<input type="text" value="Primary Line - Light and Prompt"/>	Primary Line - Light and Prompt
Multiple Tenant MWI Modes*	<input type="text" value="False"/>	False

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Immediate Divert Overview

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- The Immediate Divert (ID) is a supplementary service of the Cisco Call Manager. An iDivert initiator can be either a calling party or called party.
- The ID diverts a call to a voice mailbox of the iDivert initiator.
- A called party/callee can invoke the iDivert soft key in three call states (Call Alerting, Call Active, and Call onHold).
- A calling party/caller can invoke the iDivert soft key in two call states (Call Active and Call onHold).
- If the ID diverts a call to a voice mailbox successfully, a diverted party will hear a voice mail greeting of the iDivert initiator.

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Immediate Divert Overview (cont)

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- If the ID fails to divert a call to a voice mailbox, the call state is restored and the iDivert initiator will see the appropriate failure message text on the phone screen.
- The *Busy* text is displayed on a phone screen if a voice mail system is busy.
- The *Key Is Not Active* text is displayed on a phone screen if a caller presses the iDivert soft key at the Call Alerting state or there is no a voice mail profile.
- The *Temporary Failure* text is displayed on a phone screen if there is system failure such as the network problem and the voice mail system problem.
- The ID is not active at a member of a Line group of a Hunt list

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Join Feature

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- **New way to do ad-hoc conference for established calls on the same line appearance.**
- **No need to initiate a new consultation call.**
- **Can join up to 15 established calls (16 parties) to conference in a single feature request.**
- **Can join calls to an existing ad-hoc conference.**
- **Behave exactly the same as ad-hoc conference after it is created.**

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Possible Causes of Failure for Join Feature

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- **No conference bridge resource**
- **Not enough conference resource streams for the number selected calls.**
- **The total number of participants exceed the “Maximum Ad-hoc Conference” setting on the CCM Service Parameters Configuration page.**
- **Less than two calls is selected implicitly or explicitly**

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Service Parameter Setting

Cisco CallManager 4.0 Administration - Service Parameters Configuration - Microsoft Internet Explorer

Address: http://sw21a-cm1/CCMAdmin/serviceparameters.asp?nodeName=10.89.79.194&nodeID=7395763-6728-4A86-991D-E3130264600&serviceType=0

Retain Forward Information* False

Tone on Call Forward* True

Cluster Wide Parameters (Route Plan)

Parameter Name	Parameter Value	Suggested Value
Stop Routing on Out of Bandwidth Flag*	<input type="text" value="False"/>	False
Stop Routing on Unallocated Number Flag*	<input type="text" value="True"/>	True
Stop Routing on User Busy Flag*	<input type="text" value="True"/>	True

Cluster Wide Parameters (Service)

Parameter Name	Parameter Value	Suggested Value
Default Network Hold MOH Audio Source ID*	<input type="text" value="1"/>	1
Default User Hold MOH Audio Source ID*	<input type="text" value="1"/>	1
Maximum Ad-hoc Conference*	<input type="text" value="16"/>	4
Maximum MeetMe Conference Unicast*	<input type="text" value="128"/>	4
Media Exchange Interface Capability Timer (sec)*	<input type="text" value="8"/>	8
Media Exchange Timer (sec)*	<input type="text" value="12"/>	12

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Conferee List

- Provide a list of participant's Dn number and display name (if configured) in an ad-hoc conference.
- Only the participant in the ad-hoc conference can invoke the feature.
- Conference controller can invoke this feature to view and remove any participant in the conference.
- This feature is supported on on 7940 phone and higher or the equivalent.
- If only two participants remain after removing a participant, the conferee list is cleared because the conference is terminated. The two remaining participant is re-connected as a direct call.

Example of Conferee List for Conference controller

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- List is sorted with last participant on top
- The controller is listed at the bottom with the *
- Conference controller have the remove option

Conferee List	
1	1003 John Smith
2	1002 Jane Doe
3	1001 Jane Smith
4	1000 * John Doe

Make Your Selection
Update Exit Remove

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Direct Transfer Feature

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- New way to do call transfer for established calls.
- No need to initiate a new consultation call.
- Direct transfer can be invoked on any two established calls (see restrictions below).

Possible Causes of Failure for Direct Transfer Feature

- The number of calls selected implicitly or explicitly is not two.
- Both calls involved in the Direct Transfer are ad-hoc conference calls. This restriction is needed to avoid chaining ad-hoc conference calls.
- Both calls involved in the Direct Transfer are ad-hoc conference and barged calls. This restriction is needed to avoid chaining ad-hoc and barged calls.

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Questions

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- 1. What is the maximum number of calls that can be selected for the Join feature?
A.:16
B.:15
C.:4
D.:10

Correct Answer: B – 15 calls (16 parties)

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Questions

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- 2. Any ad-hoc conference participant can use the ConfList feature to remove any conference participant ?
A.:True
B.:False

Correct Answer: B – False (only conference controller can remove participants)

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Call Routing Features

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Agenda

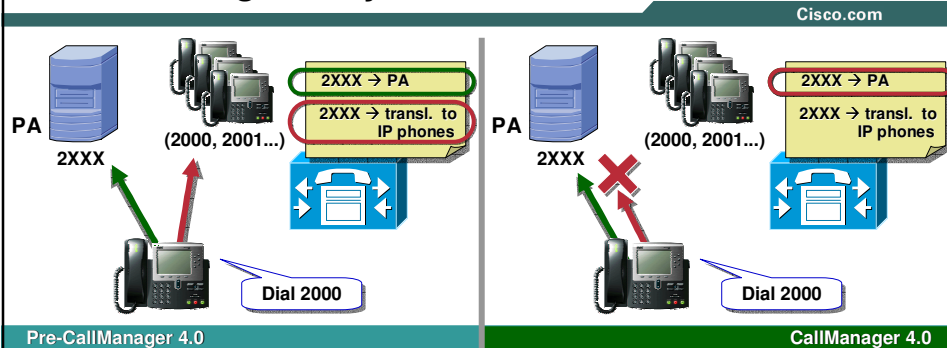
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- [Static Digit Analysis](#)
- [Unassigned Directory Numbers](#)
- [Routing Enhancements](#) (hunt lists)
- [Multilevel Precedence and Preemption](#)

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CallManager 4.0 Dial Plan Changes “Static Digit Analysis”



- Patterns are no longer removed from CCM's Digit Analysis engine when devices unregister
- “Failover” patterns no longer get hit (used today by some applications, such as PA)
- Use CallFwd on primary pattern instead (CallFwd fields now accept mask, as well as CSS)

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Unassigned Directory Numbers

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Route Plan Report

12 matching record(s) for Pattern/DN begins with "3" in All Patterns

Find: All Patterns where Pattern/DN begins with Find

and show 20 items per page

Pattern	Service	Feature	Device	User Application	Help
3000	Direct	Directory Number	SEP0000BC445F32		
3000	Direct	Directory Number	SEP0003094C3D333		
3000	Direct	Directory Number	SEP0000074463E3		
3001	Direct	Directory Number	SEP0003094C3D333		
3002	Direct	Directory Number	SEP0000BC445F32		
3003	Direct	Directory Number	SEP000607524095b		
3005	Direct	Directory Number	SEP0000074463E3		
3006	Direct	Directory Number	SEP0000074463E3		
3009	Direct	Directory Number	SEP0000074463E3		
3012	Direct	Directory Number	SEP0000074463E3		
3022	Direct	Directory Number	SEP0000BC445F32		
3456	Direct	Directory Number	SEP123412341234		

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Route Plan Enhancements

The screenshot shows the Cisco Route Plan Enhancements web interface. The 'Route Plan' menu is open, displaying a list of options: Application Dial Rules, Partition, Calling Search Space, Route Filter, Route/Hunt, Route Pattern/Hunt Pilot, Translation Pattern, External Route Plan Wizard, and Route Plan Report. The 'Route/Hunt' option is highlighted with a red box. Below the menu, the 'Line Group: LG1' configuration page is visible. It shows the status as 'Ready' and buttons for 'Update' and 'Delete'. The 'Line Group Information' section includes fields for 'Line Group Name*' (LG1), 'RNA Reversion Timeout*' (10), and 'Distribution Algorithm*' (Top Down). The page also features links for 'Add new Line Group', 'Back to Find/List Line Groups', and 'Dependency Records'. The footer contains the copyright notice '© 2003, Cisco Systems, Inc. All rights reserved. CISCO CONFIDENTIAL' and the page number '45'.

Call Distribute: Hunt List

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Terminologies

- A **Hunt list** contains Line group(s) and / or Route group(s).
- A **Hunt pilot number** is associated with a Hunt list. A caller can reach someone by dialing the Hunt pilot number.

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Call Distribute: Route Groups

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A Route group contains

- ✓ Gateways and/or ports of gateways.
- ✓ Distribution Algorithm (TopDown, Circular).

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Line Groups

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- A Line group contains
 - Directory numbers.
 - Distribution Algorithm (TopDown, Circle, Longest-Idle, Broadcast)
 - Ring-No-Answer-Reversion (RNAR) Timeout in seconds.
 - Hunt Option:
 1. Try Next member, then, try next group in Hunt list.
 2. Try Next member, but do not go to next group.
 3. Skip remaining members, and go directly to next group.
 4. Stop hunting.

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Call Distribution Overview (cont)

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Functionalities

- The CD distributes a call to idle/available member(s) of Line group(s) and Route group(s) based on
 - Call Distributing algorithm and
 - Hunt Option.
- The Call Distributing algorithm is applied at the group level.
- The Hunt Option is applied at the member level.

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Call Distributing algorithms

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- **TopDown**
distributes a call to idle/available members starting from the first idle/available member of a *Line or Route group* to the last idle/available member.
- **Circular**
distributes a call to idle/available members starting from the (n+1)-th member of a *Line or Route group*; where n-th is the member to which the CD had lastly extended the call.
- **Longest-Idle**
distributes a call to idle members, starting from the longest idle member to the least idle member of a *Line group*.
- **Broadcast**
distributes a call to all idle/available members of a *Line group*, simultaneously.

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Hunt Options

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- **Hunt Option** is applied at the member level. The Hunt options are applied at members in one of the three states (**No Answer, Busy, Not Available**) of a member.
- **No Answer** (TopDown, Circular, Longest-Idle, BroadCast):
 1. **Try Next member, then, try next group in Hunt list (Default).** Upon the RNAR timeout, the CD will distribute a call to a current member if a last member is Ring-No-Answer (RNA) within the RNAR time-frame. The CD will distribute a call to a next group if the last member is RNA and it is the last member of the group.
 2. **Try Next member, but do not go to next group.** Upon the RNAR timeout, the CD will distribute a call to a current member if a last member is RNA. The CD will reject a call if the last member is RNA and it is the last member of the group.

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Hunt Options (cont)

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3. **Skip remaining members, and go directly to next group.** Upon the RNAR timeout, the CD will distribute a call to a member of a next group if a last member is RNA.
4. **Stop hunting.** The CD will reject a call if a last member is RNA.

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Call Distribution Overview (cont)

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- The CD plays the fast busy tone/re-order tone and sends an alarm if it has distributed a call to all members but a call was not answered. The Alarm gives a warning message.
- The CD updates each Hunt list perfMon's counters, dynamically. The counters show information such as how many active calls, how many members are currently available or idle and how many calls rang but were not answered.

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Example

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Setup:

- A Line group-1 contains
 - 1000 and 1001 directory numbers.
 - **Broadcast** algorithm, **RNAR** timeout = 10 seconds.
- A Line group-2 contains
 - 2000, 2001 directory numbers of ports of the VG248 are connected to analog phones.
 - **TopDown** algorithm, **RNAR** timeout = 20 seconds.
- Line Group-1 and Line Group-2 contain
 - Hunt Option:
 - RNA = "Try Next member, then, try next group in Hunt list."
 - Busy = "Try Next member, then, try next group in Hunt list."
 - Not Available = "Try Next member, then, try next group in Hunt list."

Call Flow:

- A caller-1 calls a Hunt pilot = 1-800-123-1234.
- The 1000 and 1001 lines are ringing for 10 seconds.
- The 2000 line is ringing for 20 seconds.
- The 2001 line is ringing for 3 seconds.
- The 2001 line is answered the call.

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CallManager 4.0 Dial Plan Changes New Tools

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- **Dialed Number Analyzer Tool**
Dial plan troubleshooting tool: simulate calls from specific IP phones/gateways/trunks or from a certain CSS and observe routing behaviour
(Will ship as a plugin with 4.0(1))
- **International Dial Plan**
country-specific numbering plans for CCM to enable use of the “@” macro

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Multilevel Precedence and Preemption

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MLPP Overview

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- **MLPP**
is a service which allows priority calls to be placed by properly validated users and if necessary preempt lower priority calls for the completion of the higher priority calls
- **Precedence**
is the priority level associated with a call
- **Preemption**
is the process of terminating lower precedence calls currently using the target device such that a call of higher precedence can be extended to or through the device

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MLPP Overview

Cisco.com

- **Domain**
is determined by the subscription option of the originating user. Connections that are in use by calls in one domain can only be preempted by higher precedence calls in the same domain
- **Devices that Supported MLPP in Parche**
IP phones 794X, 796X possibly other phones soon
MGCP controlled T1 Trunks (North American)
- **Devices that don't support MLPP in Parche**
All other devices
Inter Cluster Trunk

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MLPP Precedence Patterns

Cisco.com

[Add a New Translation Pattern](#)
[Back to Find/List Translation Patterns](#)

Translation Pattern: New
Status: Ready

Pattern Definition

Translation Pattern	<input type="text"/>
Partition	< None >
Description	<input type="text"/>
Numbering Plan*	North American Numbering Plan
Route Filter	< None >
Calling Search Space	< None >
MLPP Precedence	Default
Route Option	Flash Override Flash Immediate Priority Routine Default

☒ Provide Outside Dial Tone ☐ Urgent Priority

Calling Party Transformations

☐ Use Calling Party's External Phone Number Mask

0
1
2
3
4

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MLPP Indication Enabled

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Multilevel Precedence and Preemption (MLPP) Information

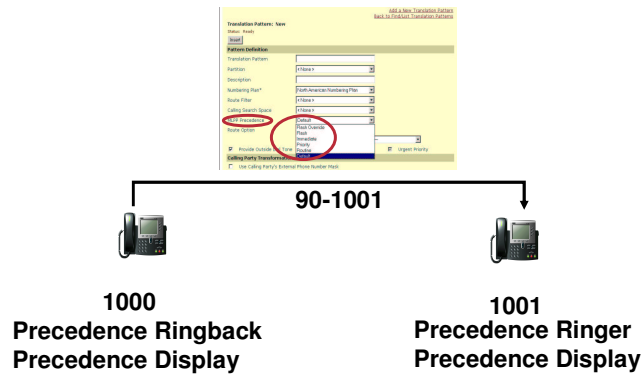
MLPP Domain	<input type="text"/> (e.g., "0000FF")
MLPP Indication	Default
MLPP Preemption	Off On Default

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Precedence Call Setup

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MLPP Preemption Enabled

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Multilevel Precedence and Preemption (MLPP) Information

MLPP Domain: (e.g., "0000FF")

MLPP Indication: Default

MLPP Preemption: Default, Disabled, Forceful, Default

Product Specific Configuration

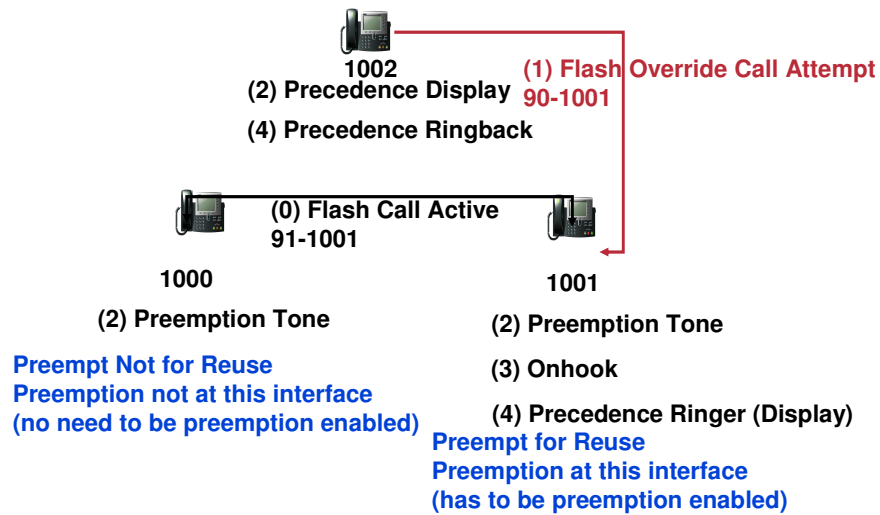
- Receiving Preemption
A device that is preemption disabled is still capable of receiving preemption in an MLPP Network
- Preemption Enabled
A device that is Preemption Enabled can be preempted at its own interface (i.e. when contention is for its resources)

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User Access Preemption

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Alternate Party Diversion

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Multilevel Precedence and Preemption Alternate Party Settings

Target (Destination)	<input type="text"/>
Calling Search Space	< None >
No Answer Ring Duration	<input type="text"/>

- Diversion on User Busy
- Diversion on No Answer Timeout
- Applicable only for Precedence Calls

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MLPP Announcements

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Translation Pattern: New
Status: Ready

Pattern Definition

Translation Pattern:
Partition:
Description:
Numbering Plan*:
Route Filter:
Calling Search Space:
MLPP Precedence:
Route Option: ☒ Route this pattern
☒ Block this pattern
☒ Provide Outside Dial Tone ☐ Allow Overlapped Calls
Calling Party Transformations
☐ Use Calling Party's External Phone Number Mask
Calling Party Transform Mask:

dropdown menu options:
— Not Selected —
No Error
Unallocated Number
Call Rejected
Number Changed
Invalid Number Format
Precedence Level Exceeded

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Questions

- 1. What do the two P's in MLPP stand for

A.:Point to Point

B.:Precedence and Preemption

C.:Preferred Protocol

D.:Ping Pong

Correct Answer: B

Questions

Cisco.com

- **2. How in CallManager Users are Authorized to be able to originate precedence Calls**
 - A.:Precedence Calls are Password protected**
 - B.:Only some users are aware of special dial codes**
 - C.:Using CSS, Partitions access is controlled to Precedence Patterns**
 - D.:There are special Check Boxes on Line Pages to allow the lines to originate precedence calls**

Correct Answer: C

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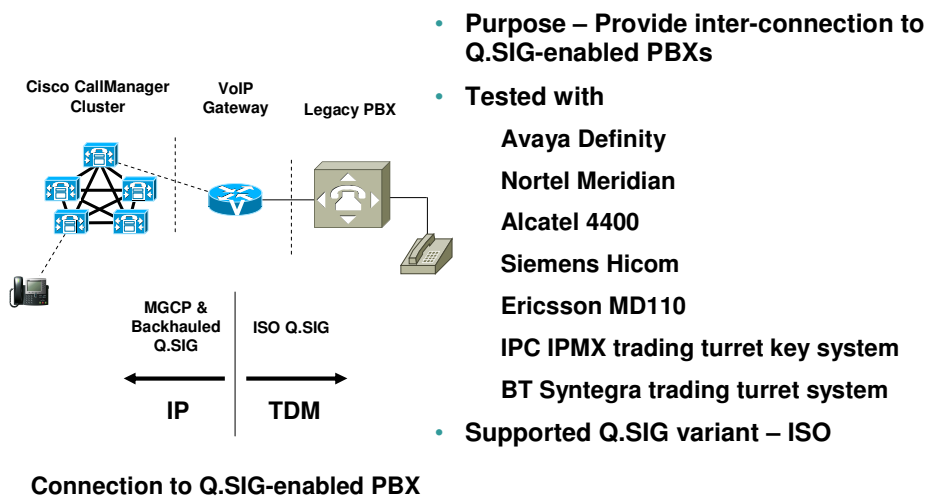
Protocol Support related features

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- [QSIG Protocol](#)
- [Session Initiation Protocol \(SIP\) Trunk](#)
- [Support for Video Calls](#)
- [H.323 Enhancements](#)

QSIG Support



Additional QSIG Features supported in 4.0

Cisco.com

- **Q.SIG Name Restriction**
Restrictions for calling name display information includes Calling Name Identification Restriction (CNIR) and Connected Name Identification Restriction (CONR).
- **Q.SIG MWI**
Cisco CallManager can send MWI and receive MWI over connections with QSIG PBXs.
- **Q.SIG Call Diversion (Forward) by forward switch.**
Cisco CallManager supports the following supplementary services:
 - Call Forward Unconditional (SS-CFU)
 - Call Forward Busy (SS-CFB)
 - Call Forward No Reply (SS-CFNR)
- **Q.SIG Transfer by join.**

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Video Support

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High Level Benefits

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For IP Telephony...

All IP Network Solution

- IP/TDM mixed solution restricts video

Enhanced communication

- All calls can be completed with video

Simplified process

- User actions the same as with voice call

Unified Administration

- Voice expertise extended to video

Voice and Video integration

- True voice and video dial plan management

Video at none or little added cost

- Video end points scale to thousands

For Videoconferencing...

Enhanced Call Routing

- Digit manipulation/dial plan sophistication

Class of Service

- Desktop/Room Systems/Executives

Forwarding capabilities

- Forward no answer/voicemail

Billing

- Billing available for all video calls

Voice and Video integration

- True voice and video dial plan management

Bandwidth management (CAC)

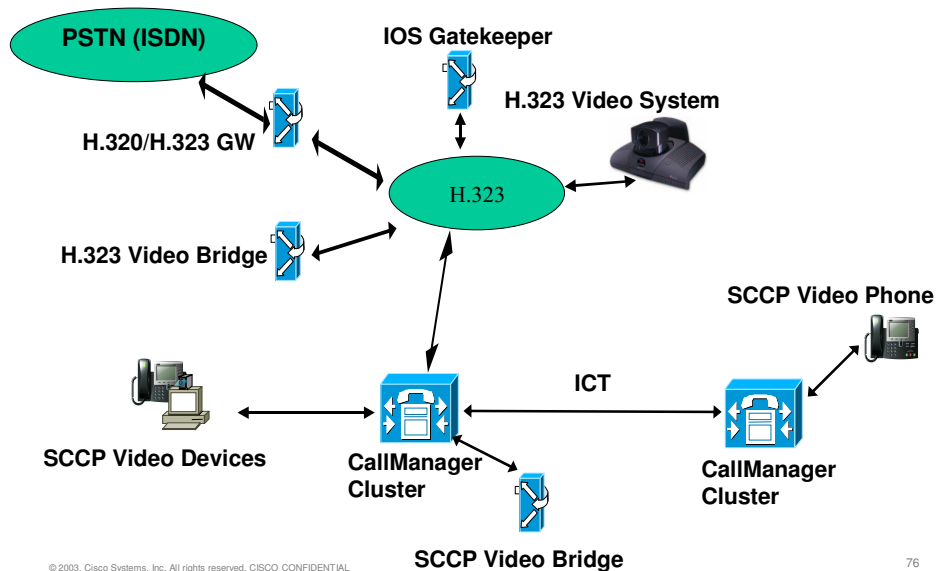
- Integrated voice and video bandwidth management

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Video Network

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Call Manager 4.0 Video Call Control

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- Support for video calls for both H.323 and SCCP
- Provides common control agent for voice or video end points
 - Unified Dial Plan – common calling patterns
 - Call Detail Records, Perfmon counters
 - Quality of Service/Call Admission Control
 - Call re-routing capabilities
- Voice Supplementary Features extended to video
 - Park, Hold, Resume, Transfer, Forward, Conference
 - Far End Camera Control, Music on Hold
- Video end point management: proven scalability

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Cisco IP/VC 35xx MCUs

Cisco.com

- **Licensed SCCP protocol to RADVision. SCCP support introduced in MCU release 3.2**
 - 3540 Model can run both SCCP and H.323 simultaneously
 - 3511 Model can only run one mode or the other due to smaller port capacity
- **Configured in CallManager as an SCCP Conferencing Resource under Service → Media Resource → Conference Bridge (*defined by MAC address*)**
 - Added to a Media Resource Group (MRG)/ Media Resource Group List (MRGL)
- **Automatically invoked when a video-capable device hits the Conference Softkey (based on that devices' MRGL)**
 - Up to 6 parties per conference (defined by "MaxAdHocConferenceParties" service parameter)
- **H.323 still used for larger dial-in conferences**
- **Not supported by SRST / CCME**

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Cisco IP/VC 35xx MCUs Capacities

Cisco.com

H.323

Call	IP/VC 3540			IP/VC
Bandwidth	100-session	60-session	30-session	3511
128	100	60	30	15
384	70	42	21	12
768	35	21	10	6
1.5 M	25	15	7	4
2.0 M	21	12	6	3
voice-only	150	90	45	26

SCCP

Call	IP/VC 3540			IP/VC
Bandwidth	100-session	60-session	30-session	3511
128	100	60	30	16
384	70	42	21	12
768	35	21	10	6
1.5 M	25	15	7	4
2.0 M	21	12	6	3
voice-only	150	90	45	26

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Feature Definition

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Call Routing Features (PBX Style)

- CFW, Hunt Groups, AAR, RouteList, Calling Search Plan
- Spaces, Dial Plan

Call Features (Supplementary Services)

- Transfer, Hold, Resume, Park, Conference

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H.323 Video Endpoints

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- H.323 endpoints can be configured as Phone, Gateway or H.323 trunk
- For ISDN video calls you need to configure an H.323/H.320 GW
- Call forwarding, dial plan, and other call routing related features will work with H.323 endpoints
- However H.323 video endpoints cannot initiate hold/resume, transfer, park, etc.
- If the H.323 endpoint supports empty capability set (ECS) then it can be the subject of hold, park, etc.
- Some vendors implementation of ECS does not allow them to increase the bandwidth of a call when the subject of transfer, redirect etc. So if the initial call is audio they may not get video even when transferred to a video endpoint. We are working with vendors to fix this issue.
- There is no video MTP or Transcoder at this point. If a transcoder or MTP is needed for audio there will be no video in the call.

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SCCP-Based End Points

Cisco.com

- The end points can initiate Call Supplementary Features
 - Park, Hold, Resume, Transfer, Call Forward, Conference
- Benefits of direct registration with CallManager
 - Integrate control for video/voice end points
 - Provides unified dial plan
 - Manage QoS/CAC
 - Administer common services - CDR, PerfMon, QPM

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Video Call

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- **Typical video call has two or three RTP streams in each direction**
 - Audio (Like normal call but added G.722 & G.728)**
 - Video (H.261, H.263, future codec options)**
 - Far End Camera Control (optional)**

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Video Codecs

Cisco.com

- **Common H.261 and H.263 parameters and typical values**
 - Bitrate (64k, 320k – can be any multiple of 100 kbps)**
 - Resolution (QCIF, CIF, Custom Picture Format)**
 - Frame Rate (15 fps, 30 fps)**
 - Annexes (I, J, usually a letter)**
- **Video codec is fixed bit rate**
- **Bandwidth of video calls = audio + video**
 - Example: 384kbps video call might be G.711 at 64 kbps + 320 kbps = 384 kbps. This does not include overhead. If the codec was G.729 then the video rate would increase to keep the total bandwidth at 384 kbps.**

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SCCP Video Bridging

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- **Setup like an audio bridge**
- **Supports mix of voice and video in conference**
- **Whether endpoint gets voice or video bridge is determined solely by MRGL**

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Bandwidth management, DSCP and alternate routing

Cisco.com

- **Regions have been enhanced to allow the bandwidth of video calls to be set. This bandwidth does not include overhead and is the sum of the video and audio bandwidth**
- **Locations now has two pools. One for video calls and one for audio calls.**
- **Retry video call as audio call is the default behavior when an endpoint cannot get the video bandwidth it needs. If you want to use routelists or AAR to try different paths for video calls uncheck this**
- **DSCP marking:**
 - Audio streams in audio only calls default to EF**
 - Video and associated audio in video calls defaults to AF41**
 - These defaults can be changed via a service parameter**

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Locations Configuration

Cisco.com

Cisco CallManager 4.0 Administration - Location Configuration - Microsoft Internet Explorer

Address: http://172.19.139.166/cnadmin/location.asp

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

Location Configuration

[Add a New Location](#)
[Back to Find/List Locations](#)

Location: New
Status: Ready

Location Information
Location Name*

Audio Calls Information
Audio Bandwidth* ☐ Unlimited ☒ kbps
If the audio quality is poor or choppy, lower the bandwidth setting. For ISDN use multiples of 56 kbps or 64 kbps.

Video Calls Information
Video Bandwidth* ☐ None ☐ Unlimited ☒ 384 kbps
* indicates required item

Applet started

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Regions Configuration

Cisco.com

Cisco CallManager 4.0 Administration - Region Configuration - Microsoft Internet Explorer

Address: http://172.19.139.166/cnadmin/regionconfig.asp?pkid=(1B189EB1-7903-11D3-8D0F-00108302EAD1)

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

Region Configuration

[Add a New Region](#)
[Back to Find/List Regions](#)
[Dependency Records](#)

Region: Default
Status: Ready

Region Information
Region Name*

Call Information
The maximum audio codec/video bandwidth supported within this region is:

Region	Audio Codec	Video Call Bandwidth
Default (Within this Region)	G.711	<input type="radio"/> None <input checked="" type="radio"/> 384 kbps
	G.723	
	G.729	
	G.722	
	GSM	
	G.728	
	G.711	
	Wideband	

* indicates required item

Page 1 of 1

Done

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Regions List

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Region Configuration

Region: Default
Status: Update completed
Update Delete Restart Devices

Region Information

Region Name* Default

Call Information

The maximum audio codec/video bandwidth supported within this region and between 2 other regions are:

Region	Audio Codec	Video Call Bandwidth
Default (Within this Region)	G.711	None 384 kbps
G.711 Region	G.711	None 384 kbps
G.729 Region	G.729	None 128 kbps

First Previous Next Last Page 1 of 1

* indicates required item

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Serviceability – Call Detail Records

- Call Detail Records will include
IP address and Port for Video Channels.
Codec: H261 or H263 or Vieo.
Bandwidth of call
Resolution: CIF, QCIF, etc.

Sample Question

Cisco.com

- **1. CallManager supports video for which protocols?**
 - A.: SCCP**
 - B.: H.323**
 - C.: MGCP**
 - D.: A & B**

Correct Answer: D

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Sample Question

Cisco.com

- **2. In video calls**
 - A.: audio and video are sent in the same RTP stream.**
 - B.: audio is sent over RTP and video packets are sent using icmp.**
 - C.: audio and video are sent in separate RTP streams.**
 - D.: video and audio are not possible in the same call.**

Correct Answer: C

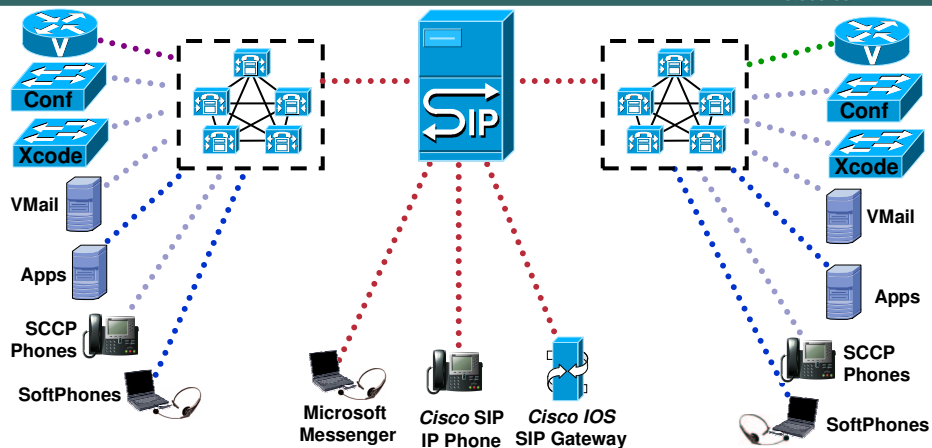
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SIP Trunks

Session Initiation Protocol (SIP) Intended / Supported Scenarios

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- InterCluster Trunk Calls (via CSPA or directly between Clusters)
 - Call Admission Control done via "Locations"
- Calls via Proxy to *Selected* SIP Endpoints and Gateways

..... SCCP
 MGCP
 H.323
 CTI
 SIP

Compliance & Interoperability

Cisco.com

RFC 2543	bis4	Supported
RFC 3261		Partially Supported
RFC 2833 DTMF		Supported
RFC 2782 DNS SRV		Supported

SIP interoperability testing included the following items:

- Cisco SIP-enabled IP phones
- Cisco SIP-enabled VoIP gateways
- Microsoft Messenger
- G.711 pass-through Fax
- Clusters that run Cisco CallManager 4.0(1)

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SCCP Initiated Supplementary Services

Cisco.com

- **Hold**

Due to existence of MTP, this happens transparently, and no media update signals sent to SIP. (This applies to all services required media changes)

- **Transfer (Blind / Consultation)**

Annunciator required to play ringback tone for Blind Transfers

- **Ad hoc Conference**

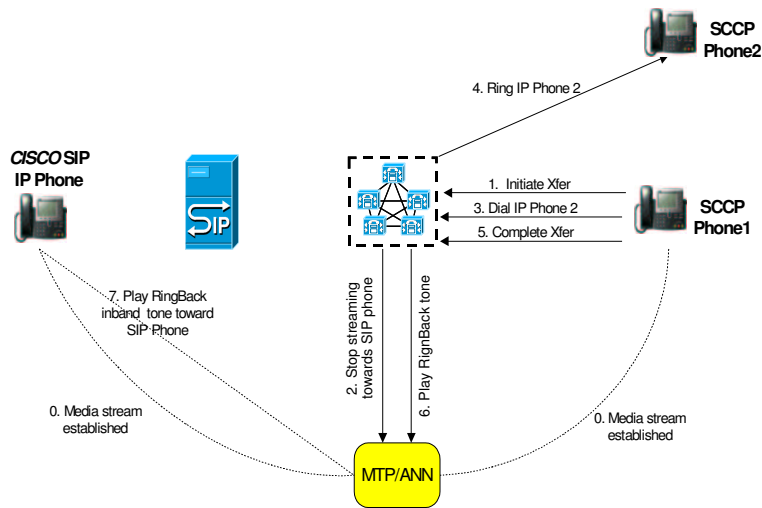
- **Call Forward (All / Busy / No Answer)**

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Ringback Tone During Blind Transfer

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SIP Initiated Supplementary Services

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- **Hold**
SIP endpoint can invoke call hold by sending Re-Invite with either:
 1. mode = send only, or
 2. mode = inactive, or
 3. IP Addr = 0.0.0.0
- **Call Forward (All / Busy / No Answer)**
- **SIP REDIRECTS (3xx) are not passed back through CCM digit analysis.**
- **SIP initiated Call Transfer (Blind / Consultation) is NOT supported.**

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DTMF Support

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- The de facto standard for SIP DTMF is based on RFC2833 which uses in-band payload types to indicate tones.
- The majority of our AVVID components do not support this standard.
- By adding this requirement to an MTP, and making SIP calls use MTP, DTMF relay between in-band and out-of-band digits are accomplished.

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Identification Services

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Cisco CallManager supports bidirectional identification for the following services:

- Calling Line Identification (CLID)/Calling Line Identification Restriction (CLIR)
- Calling Party Name Identification (CNID)/Calling Party Name Identification Restriction (CNIR)
- Connected Party Line Identification (COLD)/Connected Party Line Identification Restriction (COLR)
- Connected Party Name Identification (COND)/Connected Party Name Identification Restriction (CONR)
- Redirected Dial Number ID Service (RDNIS) information for voice-mail support

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CallManager Apps&Services

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CallManager Apps&Services

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- [Annunciator](#)
- [Attendant Console Enhancements](#)
- [Cisco CallManager Extension Mobility Enhancements](#)
- [Cisco IP Manager Assistant \(IPMA\) Enhancement](#)
- [Directory Enhancements](#)

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Annunciator Overview

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- **Enables Cisco CallManager to play pre-recorded announcements (.wav files) and tones to Cisco IP Phones, gateways, and other configurable devices.**
- **Annunciator device provided by Cisco IP Voice Media Streaming App service.**
- **SCCP based device (like SW MTP, SW CFB, MOH).**
- **Similar to Music-on-Hold (uses audio WAV files)**

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Annunciator Overview

Cisco.com

- **Functionality the Annunciator provides.**
 - Announcements consist of 1 or 2 WAV files.**
 - Announcements may be “one-shot” or “repeating”.**
 - Repeated announcements repeat at regular intervals.**
 - Annunciator signals CCM when finished if requested.**
 - Supports multiple user locales simultaneously. Primarily for verbal (language) announcements.**
 - Supports multiple network (country) locales simultaneously. Primarily for tones.**

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Annunciator Architecture

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- Announcements are defined in Annunciator.xml file for the ANN device.
- CCM identifies a specific announcement using a numeric identifier (hard coded).
- Annunciator supports Wideband, G.711 (mu-law & alaw), and G.729a codecs.
- Each target device hears the announcement from the beginning.

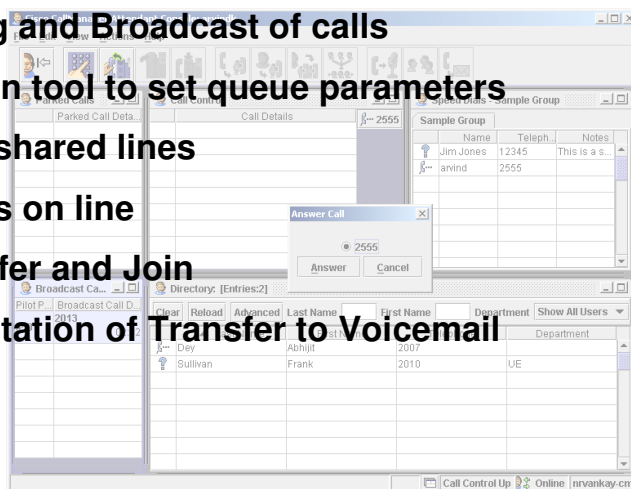
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Attendant Console: New Features in 1.3(1)

Cisco.com

- Call Queuing and Broadcast of calls
- Configuration tool to set queue parameters
- Support for shared lines
- Multiple calls on line
- Direct Transfer and Join
- Reimplementation of Transfer to Voicemail feature



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Call Queuing

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- Queued calls are NOT visible to the attendants.
- When a call comes to pilot point and all hunt groups members are busy, the call is answered and inserted into the queue if the queue is not full.
- While the call is in the queue, it is put on hold and MOH is played to the caller depending on the device pool MOH.
- If the queue is full, the call is redirected to “AlwaysRoute” member. If the “AlwaysRoute” member is not configured then the call is dropped.

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Call Queuing

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- When a hunt group member becomes available then the call is redirected to that hunt group member.
- If “HoldTime” is non-zero and the call is in the queue for longer than the “HoldTime” then the call is redirected to “AlwaysRoute” member. If the “AlwaysRoute” member is not configured then no action is taken.

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EMPOWERING THE
INTERNET GENERATION