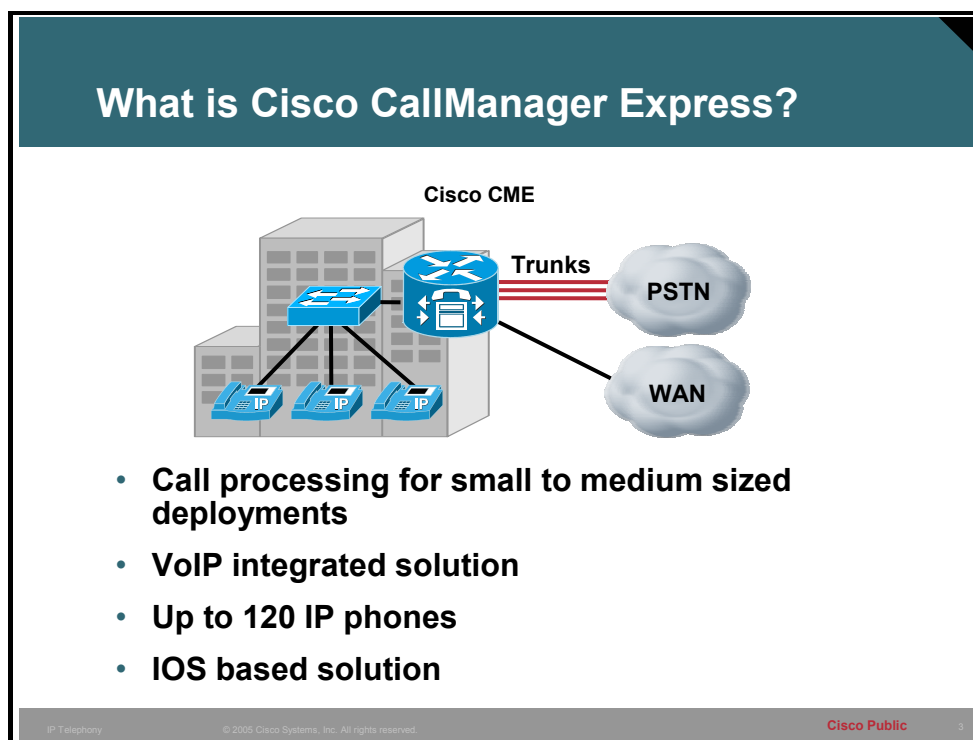


Overview of Cisco CME

What is Cisco CallManager Express?

This topic describes the Cisco CME system.



Cisco CallManager Express (CME) is an integrated call-processing solution, based on Cisco midrange access routers using Cisco IOS software, that delivers telephony services for 10 to 100 users in small offices. Cisco CME is part of Cisco IP Communication Solution and works in conjunction with the extended Cisco Systems® product portfolio, including routers, data switches, public telephone switched network (PSTN) gateways, gatekeepers, Cisco Unity voice mail, and analog terminal adapters.

Cisco CME delivers a robust set of telephony features similar to those commonly used by business users. Cisco CME is an optional feature of Cisco IOS Software and is available on a wide range of Cisco access routers supporting as many as 120 phones. This allows customers to take advantage of the benefits of IP communications without the higher costs and complexity of deploying a server-based solution. Because the solution is based on the Cisco access router and Cisco IOS software, it is simple to deploy and manage, especially for customers who already use Cisco IOS software products. Cisco CME allows customers to scale IP telephony to a small or branch office site with a solution that is easy to deploy, administer, and maintain.

What is Cisco CallManager Express? (Cont.)

- **Select IOS based platform**
- **Multiservice access routers**



IP Telephony

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Cisco CME enables Cisco's large portfolio of multiservice access routers to deliver low-end PBX and Key System type features, creating a cost-effective, highly reliable, feature-rich IP communications solution for the small office.

Cisco CME supports a new generation of intelligent IP Phones with robust display capabilities. End users can easily customize these phones based on their changing needs.

How Does Cisco CallManager Express Work?

This topic describes how Cisco CME system works.

The Cisco CME system provides the PBX-like features and functions for the IP phones. These features are a result of the concept of a centralized point of control and intelligence. The Cisco CME router provides all of the call control and intelligence needed for the IP phones to place and receive calls. In a Cisco CME deployment, the IP phones are not capable of setting up a call by themselves. In fact, the IP phones are totally under the control of the Cisco CME system and are instructed how to place or receive a call.

The IP phones will boot up and register with the Cisco CME. If configured, the Cisco CME is then able to set up or tear down calls to or from the IP phones. The IP phones and the CME router use a protocol called Skinny Client Control Protocol (SCCP) to communicate.

When a call is placed between two IP phones under the control of Cisco CME, the SCCP protocol is used to set the call up. SCCP is also commonly known as the “skinny” protocol. The SCCP protocol will not go between the two IP phones, only between the IP phone and the Cisco CME system. Once the call is set up, the Realtime Transport Protocol (RTP) will be used to carry the audio stream. RTP is used to carry voice inside of IP packets. RTP is a common protocol that is used to carry time-sensitive traffic like voice and real-time video. RTP is carried inside of a UDP segment, which is then carried inside of an IP packet.

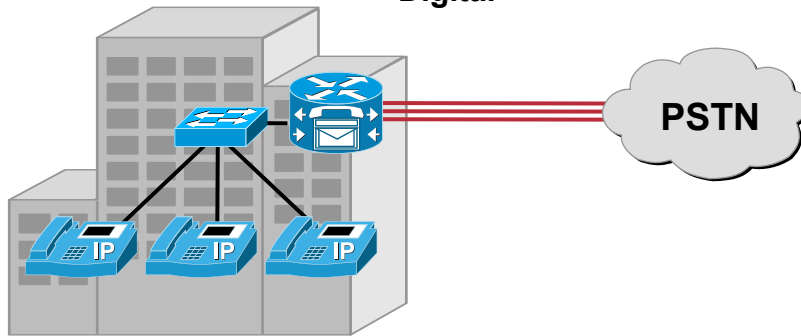
The sequence of events to for a phone call follows:

- **Step 1** - Phone A picks up the handset and dials the number of phone B
- **Step 2** - The digits dialed are set through the skinny protocol to the CME
- **Step 3** - CME knows where the phone B is due to the registration and the phones status (busy, on-hook, off-hook)
- **Step 4** - Assuming that Phone B is on-hook (available), the CME will send skinny messages to tell the phone B about the incoming call and to tell phone B to ring
- **Step 5** - Phone B answers the call by picking up the handset
- **Step 6** - Cisco CME informs both IP phones about the settings on the other and instructs them to construct RTP connections
- **Step 7** - The IP phones construct two one-way RTP connections for the voice to travel across, one for phone A’s voice to travel across to B and one for phone B’s voice to travel to A
- **Step 8** – The call takes place
- **Step 9** – Phone B hangs up and skinny messages are sent to the Cisco CME system
- **Step 10** – Cisco CME sends skinny messages to phone A instructing it that the call has been disconnected.

How Does Cisco CallManager Express Work?

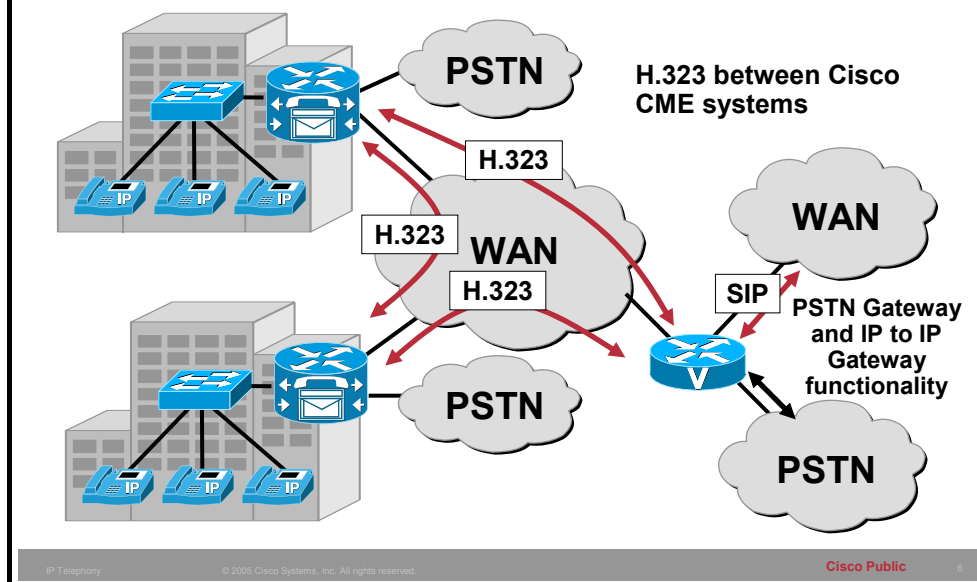
Connection(s) to PSTN

- Analog
- Digital



The Cisco CME system can act as the PSTN gateway as well as managing the IP phones. There are different types of connections to the PSTN including both digital and analog connections. The type of connection used will be dependant on the density of connections needed, technology available in the region, cost of the connections and the interfaces present on the router.

How Does Cisco CallManager Express/Cisco Unity Express Work? (Cont.)



If the Cisco CME system needs to set a call up to an IP phone under the control of another CME system, then the H.323 protocol will need to be used between the Cisco CME systems. This allows for many different deployments of Cisco CME to be integrated together through an IP-based WAN link.

The PSTN gateway function can be performed on the Cisco CME router or on a separate standalone gateway. If a separate PSTN gateway is used, the additional functionality of an IP to IP gateway functions may also be run on the router. This would enable the ability to translate between H.323 and SIP.

Note	Local PSTN will be needed for each site for at least 911 Emergency purposes
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Licensing

This topic describes the licensing of Cisco CME system.

There are four CUE license levels available on the network module (NM-CUE). There are three CUE license levels available with the advanced integration module (AIM-CUE). The fifty-mailbox option, while available, is discouraged due to the 4-port limitation of the AIM module. The preferred configuration when using the AIM module is to have the 12 or 25 mailbox license installed.

The hardware associated with CUE (NM-CUE, AIM-CUE) must be purchased with an accompanying license. Hardware and software are packaged. Mailbox licenses are purchased separately with the exception of the 12-mailbox license level that is included in the price of the hardware/software bundle. Because of this, a minimum license level of 12 mailboxes must be ordered with each CUE purchase.

CUE license files, like Cisco IOS software, can be downloaded from <http://cisco.com> and installed on any number of systems for which a license was purchased without change to the file itself. When a license is purchased or software from Cisco is used, a contractual obligation is created. The subscriber must abide by the terms spelled out in the license agreement including prohibitions regarding unauthorized replication of the software or modification to the licensed mailbox level.

The capacity limitations on ports, subscribers, and mailboxes depend on whether CUE is running on a network module or advanced integration module and is controlled by the license installed on the CUE application.