Cisco Unified Collaboration Solutions
Infrastructure Overview

Berni Gardiner, Global Knowledge Instructor, CCSI, CCDA, CCNP Voice

Introduction

Today’s business requirements are focused both inside the business, for employee productivity enhancements, as well as outside the business to enhance relationships with partners, suppliers, customers, and other external organizations.

In many cases the focus is on saving time and money while providing the same face-to-face experience that promotes building strong relationships, fosters the freedom to be innovative, and provides the collaborative environment to quickly share and discuss ideas and business solutions.

Communication methods in use today vary greatly from those of years past. Employees are becoming more mobile, working from home offices and continuing to be productive even when they are on the road. Instant access to customers, partners, and suppliers paves the way for improved cost efficiency and quicker response to trends and business needs.

Today’s corporate networks must have the flexibility to provide a robust suite of services to both internal and external clients, while maintaining security and ensuring a highly available environment.

This paper will provide an overview of the infrastructure and application components that allow Cisco Unified Collaboration Solutions to provide that anytime, anywhere, face-to-face experience.

The following services and applications will be discussed:

- Call control
- Voice messaging
- Instant messaging and presence
- Collaborative conferencing
- Collaboration Edge
- TelePresence Management Suite
Call Control

The core component of the unified collaboration system is the call control functionality. Cisco Unified Communications Manager (CM) fulfils this role in the collaboration environment.

Cisco Unified CM supports the following:

- Endpoint registration
- Call processing
- Endpoint feature administration
- Dial plan administration
- Directory services
- External application APIs
- Disaster Recovery system
- Resource management
- Signaling and device control

Unified CM provides call setup and teardown, determines call routing via the dial plan, provides control for gateways, and manages access to resources such as conferencing, transcoding, and media termination points.

Unified CM allows configuration of endpoint features such as call park, call forward, call pickup, conferencing, music on hold, and many other features.

Redundancy is achieved through clustering. A cluster will contain one Unified CM Publisher and multiple subscribers with up to a total of twenty servers in a single cluster. The publisher provides access to the only fully writable database for configuration entry and replicates the database to all other servers.
Clustering also provides scalability as each server can support up to 10,000 endpoints with up to a total of 40,000 endpoints per cluster.

For smaller deployments, Cisco Unified Communications Manager Express (CME) or Business Edition 6000 can be used. IOS routers can be used to provide remote site backup call control using the Survivable Remote Site Telephony (SRST) feature.

**Voice Messaging**
Cisco has two main products that support voice messaging. Unity Connection runs on a Linux-based server and can support up to 20,000 users per two-server cluster. Clusters can be networked together to support up to 100,000 users.

For centralized deployments where Unity Connection is at a data center or headquarters while supporting mailboxes for remote site phones, Survivable Remote Site Voicemail (SRSV) can be implemented to provide voicemail redundancy.

For smaller deployments, Unity Express can be deployed on a branch router and provide local mailbox access and control.

Both voicemail products contain a default auto attendant and allow for the configuration of multiple additional attendants if required.

**Instant Messaging (IM) and Presence**
As the name suggests, this service allows users to exchange chat messages with each other or with a group of users as a group chat. But the IM and Presence service is so much more than that.

In the past we would call meetings at the office or walk over to a colleague’s cubicle to have a face-to-face conversation. We could quickly assess whether this colleague was on their phone or available to talk to us. But as businesses downsize their real estate and more employees become teleworkers, the traditional “poke your head over the cubicle wall” approach is no longer viable. However, to be productive we still must be able to communicate as efficiently as possible. This is where IM and Presence fills the gap.

Instead of being on a floor of offices where we can physically see our co-workers, we now have a contact list that shows us what their current status is. We can choose to contact them now or later, if they are showing as on their phone or unavailable.

When we want to communicate, we can choose whether a short chat message will do the trick, or if we need to speak to that person. Once we initiate the conversation, we can determine if we need to conference in other participants, either as a group chat or a conference call. We can choose to make this an audio or video conference based on the participants’ capabilities.

Additionally, we can use the IM and Presence client, currently Cisco Jabber, to efficiently perform other tasks all with one tool. These tasks include integrating to voicemail so we can check our voicemail through Jabber. We can also integrate to Outlook Calendar so that our status indicators can automatically be updated by the system if we are booked for a meeting or will be out of the office.

Using IM and Presence makes it feel like we are back on that same floor, able to “see” our colleagues and communicate with them.
Collaborative Conferencing

When you have three or more persons together in a call, it is referred to as a conference call. With collaborative conferencing, you can have the video and audio streams mixed, as well as content streams if any of the participants are sharing a document or screen.

The call control agent, such as the CUCM, performs the call setup, but the actual mixing of streams is performed by a multi-conference bridge device of some type. In the Cisco environment, this functionality will most commonly be provided by the Cisco Telepresence Server or the Cisco MCU Series servers.

Consult the data sheet for each device to determine the capacity and supported formats for each device. Some of the differences will be in how many standard-definition and high-definition streams can be presented and which screen layouts will be supported for the end user views.

The Cisco Telepresence Conductor can be used to place multipoint bridges into groups and provide scalability for large conferences by balancing the conference load across bridges in a defined pool. Conductor can be used for permanent, scheduled, and instant conference types.

Collaborative Edge

Today’s desire to be able to communicate with corporate staff, customers, suppliers, and other external organizations has highlighted some additional challenges.

The goal of many organizations is to be able to connect to anyone at any time using any device to share any type of communication such as audio, video, or content-based.

The challenge is to allow secure connections to be set up whether you are a teleworker or are making business-to-business or business-to-consumer calls. Users outside your firewall need to be able to connect and access the full suite of collaborative resources just like users inside the firewall do.
The solution to make this possible is the Cisco Expressway series of gateways. The Expressway allows mobile Cisco Jabber users access to all the same collaboration tools whether they are at the office or on the road without requiring a VPN.

Cisco Jabber guest provides browser-based access to allow customers, contractors, or other external users to connect with corporate resources.

**Cisco Expressway Series Deployment**

The Expressway Series consists of the Expressway-C (core) and the Expressway-E (edge) devices. The edge device is usually located in the DMZ between the inner and the outer firewall. The core device is located inside the corporate network. The two devices form a secure firewall traversal link.

**TelePresence Management Suite**

TMS is like your Swiss Army knife. It can perform many tasks in your videoconferencing environment.

TMS features include:

- Centralized management of all conferences, whether ad-hoc or scheduled
- Scheduling tools for easy and fast conference creation
- Phone book management and synchronization
- Provisioning and device management
- Diagnostics and reporting

The Conference Control Center provides a view into conference activity. It monitors conference events, alarms, and changes and provides an interface for a conference administrator to manage all conferences.

With Microsoft Outlook integration, users can natively schedule meetings, making it simpler and more cost effective than having users go to a scheduling portal to schedule each meeting.

Phone book management supports synchronizing with a variety of directories, and both internal and external sources.
TMS allows you to manage up to 5,000 direct managed devices and supports deployments of up to 100,000 users, endpoints, and soft clients. It allows you to create different user groups, giving you control of which features of TMS a user has access to.

The diagnostics feature polls managed devices and various configurations and reports errors in the form of tickets. The ticketing service provides a centralized view of all error reports.

In summary, the Cisco Unified Collaboration Solution environment entails a number of components all working in concert to deliver ubiquitous anytime, anywhere access for today’s corporate communications needs. From call control providing signaling and dial plan support to the expressway series providing firewall traversal for external access, all of these devices must work together to provide a seamless user experience.

Learn More
Learn more about how you can improve productivity, enhance efficiency, and sharpen your competitive edge through training.

Cisco Collaboration Training

Visit www.globalknowledge.com or call 1-800-COURSES (1-800-268-7737) to speak with a Global Knowledge training advisor.

About the Author
Berni has worked in the IT industry for over 35 years, starting her career with software development and moved into networking in 1990. Berni is an independent consultant and has been a contract instructor with Global Knowledge since 1998. She has focused much of that time on the Cisco voice and video product lines. Other areas of expertise focus on Quality of Service implementations for converged networks.