CHAPTER 20

Overview of Cisco Unified Communications Applications and Services

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Once the network, call routing, and call control infrastructure has been put in place for your Cisco Unified Communications System, additional applications and services can be added or layered on top of that infrastructure. There are numerous applications and services that can be deployed on an existing Cisco Unified Communications infrastructure, and the following applications and services are typically deployed:

- Voice messaging — Provides voicemail services and message waiting indication.
- Rich media conferencing — Provides audio and video conferencing as well as web-based application and document sharing.
- Presence services — Provide user availability tracking across user devices and clients.
- Mobility services — Provide enterprise-level unified communications features and functionality to users outside the enterprise.
- Contact center — Provides call handling, queuing, and monitoring for large call volumes.
- Collaboration client services — Provide integration to unified communications services and leveraging of various applications.

The chapters in this part of the SRND cover the applications and services mentioned above. Each chapter provides an introduction to the application or service, followed by discussions surrounding architecture, high availability, capacity planning, and design considerations. The chapters focus on design-related aspects of the applications and services rather than product-specific support and configuration information, which is covered in the related product documentation.

This part of the SRND includes the following chapters:

- Cisco Voice Messaging, page 21-1

  This chapter examines voice messaging, a common and prevalent application within most unified communications deployments, which allows callers to send messages and subscribers of the system to retrieve messages. The chapter examines messaging deployment models, voice messaging features and functionality, voicemail networking, and design and deployment best practices for voice messaging applications.

- Cisco Collaborative Conferencing, page 22-1

  This chapter explores rich media conferencing, which allows users of the unified communications system to schedule, manage, and attend audio, video, and/or web collaboration conferences. The chapter considers various aspects of rich media conferencing, including components, deployment models, video capabilities, H.323 and SIP call control integrations, capacity and redundancy, and various solution recommendations and design best practices.

- Cisco IM and Presence, page 23-1

  This chapter discusses presence services, an increasingly critical piece of most unified communications deployments due to the productivity improvements that can be realized from user availability-based applications. This chapter defines presence and explores the various presence components and features, protocols, deployment models, redundancy, capacity, and general design guidelines.

- Cisco Collaboration Clients and Applications, page 24-1

  This chapter covers collaboration clients and applications, which are quickly closing the gap between traditional hardware-based phones and feature-rich PC-based clients. This chapter explores the various collaboration clients, their features, and the various integration methods, as well as integrations with various third-party collaboration applications.

- Mobile Unified Communications, page 25-1

  This chapter looks at mobility applications, which are becoming extremely important given the growth of mobile work forces and the blurring of enterprise boundaries for unified communications features and services, resulting in an increased demand for mobility applications and services. This chapter discusses mobility solution architectures, functionality, and design and deployment implications.

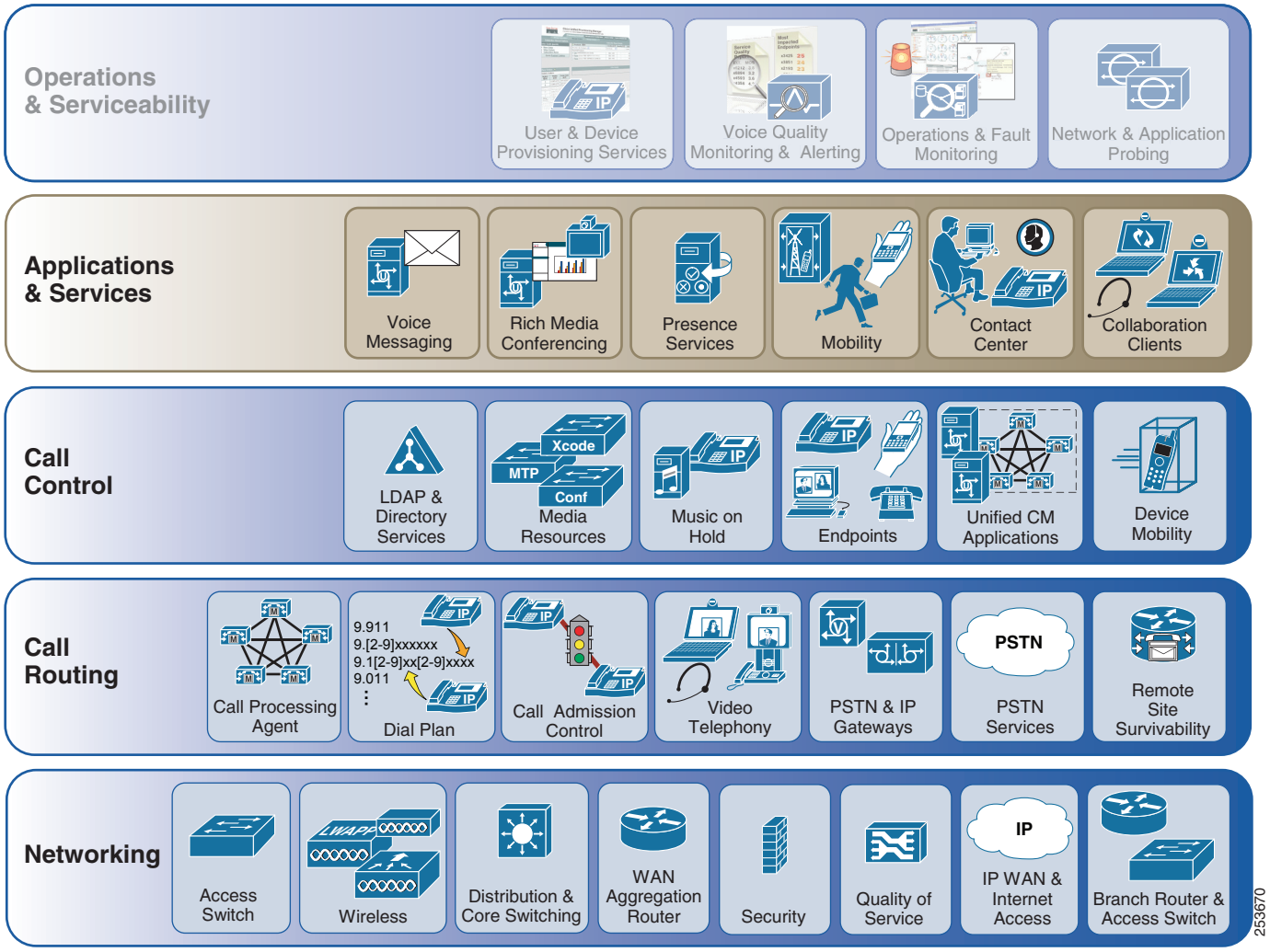
- Cisco Unified Contact Center, page 26-1

  This chapter covers contact center solutions, an important and integral part of large unified communications deployments requiring high-volume call center applications. This chapter examines call center solution architectures, functionality, and design and deployment implications.

Architecture

As with other network and application technology systems, unified communications applications and services must be layered on top of the underlying network and system infrastructures. Figure 20-1 shows the logical location of unified communications applications and services in the overall Cisco Unified Communications System architecture.

Figure 20-1 Cisco Unified Communications Applications and Services Architecture



Unified communications applications and services such as voice messaging, rich media conferencing, presence, mobility, contact center, and collaboration clients rely on the underlying unified communications call routing and call control infrastructure and network infrastructure for everything from network connectivity to basic unified communications functions such as call control, supplementary services, dial plan, call admission control, and gateway services. For example, voice messaging and rich media conferencing applications leverage the network infrastructure for reaching users in campus sites, in branch sites, and on the Internet. Further, these same applications depend on the unified communications voice and video endpoints, call routing, PSTN connectivity, and media

resources provided by the call routing and control infrastructure. In addition to relying on these infrastructure layers and basic unified communications services, applications and services are also often dependent upon each other for full functionality.

High Availability

As with network, call routing, and call control infrastructures, critical unified communications applications and services should be made highly available to ensure that required features and functionality remain available if failures occur in the network or applications. It is important to understand the various types of failures that can occur and the design considerations around those failures. In some cases, the failure of a single server or feature can impact multiple services because many unified communications applications are dependent on other applications or services. For example, while the various application service components of a contact center deployment might be functioning properly, the loss of all call control servers would effectively render the contact center unusable because the deployment is dependent upon the call control servers to route calls to the call center applications.

For applications and services such as voice messaging and rich media conferencing, high availability considerations include temporary loss of functionality due to network connectivity or application server failures resulting in the inability of callers to leave messages, of users to retrieve messages, and of users to schedule or attend conferences. In addition, failover considerations for callers and users of voice messaging and rich media conferencing applications include scenarios in which portions of the functionality can be handled by a redundant resource that allows end users to continue to access services in the event of certain failures.

High availability considerations are also a concern for services such as presence and mobility. Interrupted network connectivity or server failures will typically result in reduced functionality or, in some case, complete loss of functionality. For presence services, this can mean that some or all devices and clients will be unable to send or receive presence or availability updates. For mobility services, high availability considerations include the potential for loss of specific functionality such as two-stage dialing or dial-via-office, or reduced functionality for features such as single number reach (resulting in situations where only the enterprise phone rings or only the mobile phone rings). Further, in some failure scenarios, enterprise phones and mobile clients might have to reregister, reconnect and/or re-authenticate before full functionality is available again.

For contact center deployments, there are numerous servers and components for which high availability must be considered. Typically, an isolated single-server or single-component failure can be handled without loss of features or functionality as long as the server or component has been made redundant. In other situations, loss of multiple servers or components will typically result in loss of some features or functionality. However, in scenarios where there is complete loss of a particular component such as all call control servers, more catastrophic loss of features or functionality is possible.

When considering collaboration clients and applications, high availability is certainly important. Not only can specific collaboration features or functions become unavailable in failure scenarios, but in some cases presence-capable clients might be unable to connect to the network for even basic functionality such as registration and making or receiving calls. In other cases, clients or devices might have to reconnect and re-authenticate in order to return to service.

Capacity Planning

Network, call routing, and call control infrastructures must be designed and deployed with an understanding of the capacity and scalability of the individual components and the overall system. Similarly, deployments of unified communications applications and services must also be designed with attention to capacity and scalability considerations. When deploying various unified communications applications, not only is it important to consider the scalability of the applications themselves, but you must also consider the scalability of the underlying infrastructures. Certainly the network infrastructure must have available bandwidth and be capable of handling the additional traffic load the applications will create. Likewise, the call routing and control infrastructure must be capable of handling user and device configuration and registration as well as application integration loads surrounding protocols and connections. For example, with applications and services such as mobility, presence, and contact center, there are capacity implications for each of these individual applications in terms of users, devices, and features, but just as important is the scalability of the underlying infrastructure to handle connections and protocols such as Computer Telephony Integration (CTI). While a mobility, presence, or contact center application may be able to support many CTI connections, the underlying call control and routing infrastructure might not have available capacity to handle the added CTI load of these application and services.

For applications and services such as voice messaging and rich media conferencing, capacity planning considerations include things like number of mailboxes or users, mailbox size, audio and video ports, and MCU sessions. In most cases additional capacity can be added by increasing the number of application servers and MCUs or by upgrading server or MCU hardware with higher-scale models, assuming the underlying network and call routing and control infrastructures are capable of handling the additional load.

Capacity planning considerations are also a concern for services such as presence and mobility. Scalability must be contemplated not only for things like numbers of configured and supported users and devices, but also for the number of integrations and connections between those applications and others. The volume of two-stage dialing and dial-via-office calls is of particular concern for mobility applications from the perspective of both the call control capacity and the PSTN gateway capacity. With presence services, on the other hand, critical scalability concerns include frequency of presence status changes and the propagation of these changes to the network, as well as text or instant message volumes. Typically, additional application servers or hardware upgrades will result in increased capacity for these applications and services, but the underlying call routing and control infrastructures must be capable of handling any increases in load.

Contact center deployments are no different than other applications and services in terms of scalability concerns. Certainly the number of agents and agent devices handling calls is important in terms of user and device configuration and registration. However, the major concerns in terms capacity for contact center deployments are the high number of busy hour call attempts (BHCA) common in contact centers and the number of CTI integrations to the call control and routing infrastructure.

When considering collaboration clients and application capacity planning, device registration and configuration are the most important scalability concerns. However, certainly there are other scalability implications in terms of the back-end applications and services such as presence and messaging. Further, when deploying or integrating various clients with third-party applications and infrastructures, you must also consider the supported capacities for those third-party deployments.

For a complete discussion of system sizing, capacity planning, and deployment considerations related to sizing, refer to the chapter on Unified Communications Design and Deployment Sizing Considerations, page 29-1.