Introducing Cisco IPICS

Cisco IP Interoperability and Collaboration System (Cisco IPICS) is a platform that enables users to bring their own devices into the world of push-to-talk (PTT) communications in Cisco Unified Communications (UC) environments. Cisco IPICS bridges the worlds of land mobile radio (LMR) and UC, providing the ability for communication between disparate devices such as traditional and digital radio, Android, and Apple iOS devices.

This chapter provides an overview of Cisco IPICS. It describes the advantages and benefits that Cisco IPICS offers to various organizations. It also introduces the primary components of a Cisco IPICS deployment.

This chapter includes these topics:
- Cisco IPICS Benefits, page 1-1
- Cisco IPICS Components, page 1-2

Cisco IPICS Benefits

On-premises PTT is an important requirement in many markets, including the following segments:

- Enterprise (operations, safety and security)
- Commercial
- Retail
- Education
- Healthcare
- Government
- Service provider

Organizations in these market segments typically deploy several wired networks and wireless networks to achieve their business and service goals. However, such disparate solutions often do not support interoperability and collaboration, which can affect operational efficiency and customer satisfaction.

Examples of such disparate networks include:

- Legacy push-to-talk (PTT) radio networks (analog or digital at different frequencies) that are used for voice communications within groups. Communication is usually restricted within a specified group or network because of radio frequency (RF) limitations and proprietary protocols.
• Traditional hoot bridges that are connected over time-division multiplexing (TDM) circuits. These deployments cannot provide audit trails and they do not seamlessly integrate with other PTT or Voice over IP (VoIP) networks. In addition, they do not offer the mobility and serviceability that an IP deployment provides.

• VoIP networks that are used to carry packetized voice on wired or wireless IP phones or on other IP clients. These clients do not interact with the PTT services.

For organizations that use disparate networks, Cisco IPICS provides the following benefits:

• Easy-to-use installation, management, and operational features—Enables a migration path to more robust IP applications, devices, and IP-based solutions to achieve greater operational efficiencies.

• Effective solution—Streamlines operations, and command and control while protecting investments in deployed radio networks or legacy hoot bridges and applications.

• Efficient deployment—Leverages current IP infrastructure with minimal upgrades required, decreasing total cost of ownership.

• Resiliency—Eliminates communications silos and single points of failure.

### Cisco IPICS Components

A Cisco IPICS deployment involves several hardware and software components to enable true interoperability and collaboration. Components include the Cisco IPICS server, Cisco Unified Media Service (UMS) server, Cisco IOS and gateways, and LDAP integration. Deployments may also employ integration with devices such as call center turrets, digital radio gateways, messaging gateways, Private Mobile Broadband technologies, and others.

Figure 1-1 illustrates the major components of a Cisco IPICS deployment.
Table 1-1 provides an overview of major Cisco IPICS components. Other chapters in this manual provide more detailed information about using and configuring several of these components. In addition, Cisco provides a wide variety of technical and user documentation that explains in detail Cisco components that are used in the deployment of Cisco IPICS. These documents include information about installing, configuring, operating, managing, maintaining, and troubleshooting components.

For version and compatibility information, see *Cisco IPICS Compatibility Matrix*.

**Table 1-1  Cisco IPICS Component Overview**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
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</table>
| Cisco IPICS server        | Provides the core functionality of the Cisco IPICS system. The Cisco IPICS server software runs on the Cisco Linux operating system (based on Red Hat Linux) on selected Cisco Unified Computing System (UCS) platforms and performs these functions:  
  • Hosts the Cisco IPICS Administration Console, an administration GUI that enables dynamic resource management for users, channels, and virtual talk groups (VTGs).  
  • Provides Cisco IPICS authentication and security services  
  • Stores configuration and operational data  
  • Enables integration with various media resources, such as UMS components, Cisco Unified IP Phones, Cisco Unified Communications Manager, and Cisco IOS SIP gateways |
| Router media service (RMS)| Provide media stream mixing by looping back DS0 resources on one or more pairs of T1 or E1 interfaces that are connected back to back with a T1 loopback cable. The RMS provides capabilities that include the following:  
  • Functions that are required to combine two or more channels.  
  • Multicast channel mixing, using the Cisco Hoot 'n' Holler feature, to support virtual talk groups (VTGs).  
  • PVDM resources are required for DSP resources.  
  • The addition of a single DS0 loopback pair to the RMS when one or more dial-in users or mobile client users joins a channel or VTG |
| Unified Media Service (UMS)| Enables media services and provides these capabilities:  
  • Functions that are required to combine two or more channels or VTGs.  
  • Multicast channel mixing, using the Cisco Hoot 'n' Holler feature, to support VTGs  
  • PTT media convergence for multicast, unicast, TDM, and SIP endpoints |
| Cisco IPICS Dispatch Console (IDC) | A graphical-based application that installs and runs on a client PC and allows Cisco IPICS users to communicate with other users via radio, telephone, mobile device, or PC. Also lets users participate in VTGs and incidents, manage and operate a variety of resource such as channels, radios, incidents, and VTGs, and perform a variety of other activities. |
| Cisco Instant Connect for Android Devices | Application that allow users of Android devices to use mobile clients and Windows machines to interact with other participants in a Cisco IPICS talkline and perform a variety of other activities. |
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<td>Cisco Instant Connect for Microsoft Windows</td>
<td>Allows Microsoft Windows users to participate in talklines and mobile clients activities on Microsoft Windows machines.</td>
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<tr>
<td>Cisco IPICS ISSI Gateway (ISSIG)</td>
<td>An ISSI Gateway allows multiple RF subsystems (RFSSs) to be connected together into wide area networks that extends area coverage for P25 compliant digital radios</td>
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<tr>
<td>Cisco Digital Fixed Station Interface Gateway (DFSIG)</td>
<td>Serves as a gateway between Cisco IPICS and P25 DFSI capable fixed stations (FS). It is a proxy for all non-P25 clients within Cisco IPICS and is responsible for transcoding between multicast RTP streams (G.711) and SIP based P25 CAI frames (IMBE codec for digital communications and PCM for analog communications). It also is responsible for encryption and decryption the audio stream when necessary.</td>
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<tr>
<td>Cisco Instant Connect MIDlet</td>
<td>An application for certain Cisco Unified Wireless IP Phone models that lets you communicate with other Cisco IPICS users via a point-to-point or standard telephone call, and communicate via channels, VTGs, and incidents by using the IP phone as a PTT device. For a list of Cisco Unified Wireless IP Phone models and minimum firmware version that support the Cisco Instant Connect MIDlet, see <em>Cisco IPICS Compatibility Matrix</em>. For detailed information about installing and using the MIDlet, see <em>Cisco Instant Connect MIDlet Reference Guide</em>.</td>
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<tr>
<td>Unified media service (UMS)</td>
<td>Enables media services and provides these capabilities:</td>
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<td>• Provides the functions that are required to combine two or more VTGs.</td>
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<td>• Multicast channel mixing, using the Cisco Hoot ‘n’ Holler feature, to support VTGs.</td>
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<td>• Enables PTT media convergence for multicast, unicast, TDM, and SIP endpoints.</td>
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<td>SIP provider</td>
<td>Handles calls to and from the Cisco IPICS policy engine.</td>
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<td>LMR gateway</td>
<td>LMR gateways provide voice interoperability between radio and non-radio networks by bridging radio channels and talk groups to IP multicast streams. The LMR gateway functionality is available in certain versions of Cisco IOS software.</td>
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<td>Networking components</td>
<td>Include switches, routers, firewalls, mobile access routers, and wireless access points and bridges.</td>
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<tr>
<td>Cisco Unified IP Phone</td>
<td>Cisco IPICS integrates selected models of the Cisco Unified IP Phone. Users of these phones can select a channel from a list of channels on which to participate when Cisco IPICS is configured as a phone service for Cisco Unified Communications Manager or for Cisco Unified Communications Manager Express when it is bundled with supported versions of Cisco IOS software.</td>
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