Remote Expert Mobile Solution Overview and Design

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Remote Expert Mobile Overview

Cisco Remote Expert Mobile enables real-time customer engagement within mobile and web applications. Remote Expert Mobile is a software solution that allows for personal and actionable customer interaction (interconnected to a contact center environment), from click-to-call to a full collaborative experience (screen share, cobrowse, remote control, content push, annotation, and form-fill). For example, Remote Expert Mobile can connect investors with their financial advisors within a mobile trading application (B2C—Business to Consumer). A field employee can use a mobile application to connect to an internal help desk (B2E—Business to Employee). Developers can deliver voice and video calls in mobile or web applications.

Remote Expert Mobile supports the following browsers for placing and receiving calls:

- Google Chrome
- Internet Explorer
- Mozilla Firefox
- Apple Safari

With WebRTC at its core, in-app communications are enabled without the need for plugins. Where WebRTC is not yet supported (in Internet Explorer and Safari), WebRTC plugins are provided.
Remote Expert Mobile also delivers integrated communications in iOS and Android applications through native libraries.

Remote Expert Mobile provides high-quality video collaboration between customers and agents. The Cisco Remote Expert Mobile solution connects customers with subject matter experts regardless of their respective physical locations. The Remote Expert Mobile solution brings together Cisco technologies in the areas of Telepresence, Collaboration, and Contact Center.

The Remote Expert Mobile components can be installed in an existing Enterprise network. In the following figure, the Remote Enterprise Mobile components are shown in the two boxes on the upper left. The components of the existing Enterprise network are shown in the remaining boxes.

When agents receive Remote Expert Mobile calls, expert assist functionality is enabled on their desktops. When agents receive internal calls from Enterprise registered callers, expert assist functionality is disabled.

Remote Expert Mobile offers two deployment types:

- **Contact center deployment**
  Remote Expert Mobile is supported with the following contact center solutions:
  
  - Cisco Packaged Contact Center Enterprise (Packaged CCE)
  - Cisco Unified Contact Center Enterprise (Unified CCE)
  - Cisco Unified Contact Center Express (Unified CCX)
  - Cisco Hosted Collaboration Solution for Contact Center (HCS for Contact Center)
Remote Expert Mobile supports the following capabilities:

- Video communication between agents and callers.
- Video on Hold—Videos play to callers when they are placed on hold by an agent.
- Video-in-Queue—Videos play to callers while they are in queue. This feature presents high-definition video prompts that allow callers to use DTMF keys to navigate a video menu.
  Video-in-Queue is fully supported in Packaged CCE, Unified CCE, and HCS for Contact Center deployments.
- Cisco MediaSense recording—Cisco MediaSense can record both the video and audio parts of a video call or record the audio only at the Cisco Unified Border Element level.

Depending on how Remote Expert Mobile is deployed, callers may connect with agents either from within the enterprise network or from devices outside the enterprise. Callers from within the enterprise use endpoints that are registered to Cisco Unified Communications Manager. For example, company employees can engage in a video call with your IT help desk. Callers from outside the enterprise network use an iOS-based or Android-based smartphone or tablet or a browser client for video calls with agents. Expert Assist functionality is not enabled when agents receive calls from within the enterprise.

Remote Expert Mobile requires the following components:

- Cisco MediaSense to store, stream, and play video content. MediaSense can also record video calls.
- Telepresence MCU Video Conference Bridge to facilitate multiparty video conferences.
- Cisco Unified Border Element to connect video calls from Unified Customer Voice Portal (Unified CVP) to Cisco MediaSense to queue the calls or play video prompts. Cisco Unified Border Element is also used for video recording and Unified CVP call survivability at the ingress gateway.
- Video endpoints for agents and callers.
- Remote Expert Mobile Application Server and Media Broker to connect callers from the Internet with agents.

The Remote Expert Mobile Application Server provides a WebRTC to SIP gateway and an Expert Assist Finesse gadget and Expert console.

The Remote Expert Media Broker also provides transcoding and pass-through media.

The Remote Expert Mobile Application Server and Media Broker provide expert assist functionality, which includes

- Web cobrowse and screen sharing
- Remote control
- Annotation
- Content push (document and images)
- URL push
- Assisted form completion

- Reverse Proxy to provide load balancing, failover, a single URL for the customer, and SSL offloading.
Customer Location

In the Cisco Remote Expert Mobile solution architecture, the customer location is any one of several devices the customer chooses to use. The location can be

- Browser-based from a Windows laptop or Apple Mac
- Apple iOS or Android applications from smart phones or tablets

Access is typically through an interactive web-based interface. Customers can select a video chat or assist button to escalate to a video call with an expert. Depending on the browser used, Remote Expert Mobile may download a WebRTC client in the background. Then an IP call is placed to the enterprise using a predetermined HTTP URL. The customer initiating the video call is not registered with the enterprise telephony system. The enterprise video telephony system completes the call from the customer device when the call is queued for the next available expert.

Infrastructure Required for Access

Because customers access the enterprise from the public Internet, Remote Expert Mobile has unique infrastructure requirements. The enterprise typically has two firewalls that this solution must traverse. The first firewall allows access into the corporate DMZ. The DMZ is a network segment within the corporate firewall from the Internet but without unlimited access to the rest of the enterprise. To provide access through this firewall, you must enable the necessary protocols for the video call to be recognized and allowed through.

The Cisco Remote Expert Mobile Media Broker resides within the DMZ and works with the Cisco Remote Expert Mobile Application Server. The Remote Expert Mobile Application Server is located within the data center, beyond the data center firewall, to enable communication to the Unified Communications enterprise infrastructure.
The infrastructure required within the enterprise for this part of the solution includes Cisco Unified Communications Manager or Unified CCE, Packaged CCE, HCS for Contact Center, or Unified CCX. Video-in-Queue, Video on Hold, and Video Recording can be deployed as optional features of the solution. Remote Expert Mobile callers from the Internet and leveraging Remote Expert Mobile components can perform expert assist functions in addition to the audio or video call.

**Deployment Models**

The following figure illustrates a Remote Expert Mobile deployment with Packaged CCE, Unified CCE, or HCS for Contact Center.

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**Note**

Enterprise registered callers (such as callers to an internal help desk) can only make audio and video calls. When agents receive Remote Expert Mobile calls, expert assist functionality is enabled on their desktops. When agents receive internal calls from Enterprise registered callers, expert assist functionality is disabled.

The following figure illustrates a Remote Expert Mobile deployment with Unified CCX.
Cisco Unified Border Element is an optional component for Unified CCX deployments. It is required only if you need recording at the Cisco Unified Border Element level.

Enterprise registered callers (such as callers to an internal help desk) can only make audio and video calls. When agents receive Remote Expert Mobile calls, expert assist functionality is enabled on their desktops. When agents receive internal calls from Enterprise registered callers, expert assist functionality is disabled.

The following figure illustrates a Remote Expert Mobile deployed in a Unified Communications Manager only solution.
In the Unified Communications Manager only solution, the expert audio and video terminate on the browser only.

Cisco Unified Border Element is an optional component for Unified Communications Manager only deployments. It is required only if you need recording at the Cisco Unified Border Element level.

Enterprise registered callers (such as callers to an internal help desk) can only make audio and video calls. When agents receive Remote Expert Mobile calls, expert assist functionality is enabled on their desktops. When agents receive internal calls from Enterprise registered callers, expert assist functionality is disabled.

**Remote Expert Mobile Feature Support**

The following table lists the Remote Expert Mobile features and indicates which deployment types support each feature.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Unified CCE/Packaged CCE/HCS for Contact Center</th>
<th>Unified CCX</th>
<th>Unified Communications Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Conference and Transfer</td>
<td>Supported</td>
<td>Supported only for certain endpoints</td>
<td>Not supported</td>
</tr>
<tr>
<td>Video on Hold</td>
<td>Supported</td>
<td>Supported</td>
<td>Not supported</td>
</tr>
</tbody>
</table>
Restrictions

The following table lists restrictions for Remote Expert Mobile.

<table>
<thead>
<tr>
<th>Restriction Type</th>
<th>Restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact center features</td>
<td>Remote Expert Mobile does not support the following contact center features:</td>
</tr>
<tr>
<td></td>
<td>• Agent Greeting</td>
</tr>
<tr>
<td></td>
<td>• Whisper Announcement</td>
</tr>
<tr>
<td></td>
<td>• Mobile Agent</td>
</tr>
<tr>
<td></td>
<td>• Silent Monitor</td>
</tr>
<tr>
<td></td>
<td>• Remote Silent Monitor</td>
</tr>
<tr>
<td></td>
<td>• Video on Hold (caller-initiated)</td>
</tr>
<tr>
<td></td>
<td>• Outbound Dialer</td>
</tr>
<tr>
<td></td>
<td>• Courtesy Callback</td>
</tr>
<tr>
<td>Jabber endpoints</td>
<td>Agents can use Jabber for Mac and Windows as a video endpoint only. As for all endpoints, agents must perform all call control operations (except for answer, mute, and hangup) using the agent desktop. IM and Presence are not supported as part of Jabber.</td>
</tr>
<tr>
<td>Audio codec</td>
<td>Cisco MediaSense does not support G.711 a-law codec for video playback.</td>
</tr>
</tbody>
</table>
Restriction Type | Restriction
---|---
Video resolution scaling | MediaSense does not support video resolution scaling. For example, a 320p video plays at 320p on every device, and a 1080p video plays at 1080p on every device. Supported devices properly handle any necessary up- or down-scaling themselves.

Agent and supervisor desktop features | Agent desktops support a limited set of features for video agents, as follows:
- Standard actions — Agent log in and log out, Agent State (such as Ready, Not Ready, Wrap Up), Dial, Answer, Release, and CTI data.
- Additional services — Hold, Retrieve, and Blind/Consult Transfer/Conference.

Agent desktops do not support these features for video agents:
- Silent Monitor
- Supervisor Barge-In
- Intercept

### Supported Video Formats and Codecs

Cisco MediaSense supports the following formats and codecs for uploaded videos:

- MP4 video with up to 1080p resolution
- H.264 video codec
- AAC-LD MP4A-LATM audio codec

Videos play back using the AAC-LD MP4A-LATM, G.711 mu-law, or G.722 codec, depending on the endpoint.

### Call Flows

Note

Cisco Unified Border Element is an optional component in Unified CCX and Unified Communications Manager only deployments. It is required only if you need recording at the Cisco Unified Border Element level.

The following figure illustrates the Remote Expert Mobile high-level topology.
Remote Expert Mobile components include

- **Reverse Proxy**—Load balancing, failover, hiding Enterprise topology, single URL for consumer, SSL offloading
- **Media Broker**—Media pass-through and transcoding
- **Application Server**—WebRTC to SIP gateway, Expert Assist gadget, and Console server
- **Client SDK**—iOS and Android SDK for custom applications, JavaScript, and plugin for browser

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**Note**

Cisco Unified Border Element is an optional component in Unified CCX and Unified Communications Manager only deployments. It is required only if you need recording at a Cisco Unified Border Element level.

For Unified CCX and Unified Communications Manager only deployments without Cisco Unified Border Element:

In the Cisco Remote Expert Mobile Web Administration portal, go to **Gateway > General Administration**. For the Outbound Sip Server address, replace the IP address of the Cisco Unified Border Element with the IP address of the Unified Communications Manager.

The following figure illustrates a call flow in a contact center environment.
1. The client (consumer) connects to the enterprise web server through the Reverse Proxy and starts a call.
2. The web application gets a session token from the Remote Expert Mobile Application Server and returns it to the client.
3. The client initiates a web socket connection using the secured context already established.
5. The Remote Expert Mobile Application Server communicates with the Remote Expert Mobile Media Broker to reserve and negotiate media SDP.
6. The Remote Expert Mobile Application Server sends a SIP INVITE to the CUBE-E (ingress) gateway.
7. CUBE-E sends a SIP INVITE to the Packaged CCE, Unified CCE, Unified CCX, or HCS for Contact Center.
8. Packaged CCE, Unified CCE, Unified CCX, or HCS for Contact Center routes the call to an agent.
9. The agent uses the Expert Assist Finesse gadget to start the expert assist session with the client (consumer).

The following figure illustrates a call flow in a Unified Communications Manager-only environment.
1 The client (consumer) connects to the enterprise web server through the Reverse Proxy and starts a call.
2 The web application gets a session token from the Remote Expert Mobile Application Server and returns it to the client.
3 The client initiates a web socket connection using the secured context already established.
4 The Reverse Proxy establishes the web socket connection with the Remote Expert Mobile Application Server.
5 The Remote Expert Mobile Application Server communicates with the Remote Expert Mobile Media Broker to reserve and negotiate media SDP.
6 The Remote Expert Mobile Application Server sends a SIP INVITE to the CUBE-E (ingress) gateway.
7 CUBE-E sends the call to Unified Communications Manager over a SIP trunk.
8 Unified Communications Manager performs hunt group routing and sends the call to a CTI device, which is associated to "Extend and Connect" trunk back to the Remote Expert Mobile Application Server.
9 The Remote Expert Mobile Application Server routes the call to the browser terminating audio and video.
10 The agent uses the Expert Assist console to start the expert assist session with the client (consumer).

Network Considerations

The Remote Expert Mobile solution leverages the Cisco portfolio of routers, switches, and network services so that you can deploy an infrastructure that meets the traffic demands of video. You can configure Cisco Remote Expert Mobile solutions with varying degrees of High Definition video.

To understand the bandwidth required within your deployment, consider the objective of the experience (stationary and detailed video or conversational with a lot of movement). The solution can be delivered over private WANs, MPLS VPNs, or Metro Ethernet networks as long as decisions about QoS policies and video
and bandwidth requirements are appropriate. Cisco powered WAN/VPN service provider networks typically maintain the levels of network quality required for an acceptable video experience.


Bandwidth and QoS Considerations


Bandwidth Considerations

To create an immersive collaborative experience between the customer and the agent or expert, plan for and provision Cisco TelePresence calls for the best quality at a resolution of 1080p (1920 x 1080). For calls that come in over the Internet from mobile devices, the maximum resolution is 720p.

The Cisco TelePresence System EX60 and EX90 offer several profile definitions depending on the physical environment in which the devices are located. The minimum required bandwidth depends on the following:

- Optimal definition profile (normal, medium, or high)
- Resolution
- Frame rate

*Note*

The profile definitions refer to the amount of compression applied to the media streams. These names do not refer to the amount of bandwidth required for the profile.

In the Cisco TelePresence software, you can increase the video resolution for situations in which lighting and other environmental considerations are good. You can use the High setting in dedicated rooms with optimal light conditions. You can use Medium for good, stable light conditions. The default setting is Normal. You can usually use the default.

Test each location for session quality, especially if you use the Medium or High setting. In areas with many windows, test at different times of day to ensure that the chosen profile always results in an immersive conferencing experience.

QoS Considerations

The following table provides general QoS requirements for the Cisco TelePresence system. Consider these requirements when you plan your expert location capacity.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Optimal</th>
<th>Acceptable</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latency</td>
<td>&lt;= 150-ms RTT</td>
<td>&lt;= 200-ms RTT</td>
<td>&gt;= 400-ms RTT</td>
</tr>
<tr>
<td>Jitter (peak to peak)</td>
<td>&lt;= 10 ms</td>
<td>&lt;= 20 ms</td>
<td>&gt;= 40 ms</td>
</tr>
<tr>
<td>Packet loss</td>
<td>&lt;= 0.05%</td>
<td>&lt;= 0.10%</td>
<td>&gt;= 0.20%</td>
</tr>
</tbody>
</table>
Detailed QoS guidance for the expert location WAN edge can depend on whether the WAN is based on a Layer 2 design or on an MPLS and VPN design. For more information, see the Cisco TelePresence Network System 2.0 Design Guide at http://www.cisco.com/c/en/us/solutions/enterprise/design-zone-medianet/landing_vid_tPresence.html.

Operational Considerations

A Cisco Remote Expert Mobile solution deployment requires a comprehensive management architecture. The management architecture must provide the capability to provision, monitor, and troubleshoot geographically dispersed customer pods and expert agent positions on a continuous basis.

The number of hardware and software components in the end-to-end system (data center, customer location, and expert location) can make managing a Cisco Remote Expert Mobile solution a challenge. These components provide services to remote users and administrators. Administrators must manage different technologies and services, such as network, storage, databases, and Unified Communications resources.

Use the Cisco Prime Collaboration Assurance (PCA) to monitor the Cisco Unified Communications infrastructure, network components (switches and routers), TelePresence video endpoints, and virtualized ESXi hosts.