



## MRA Overview

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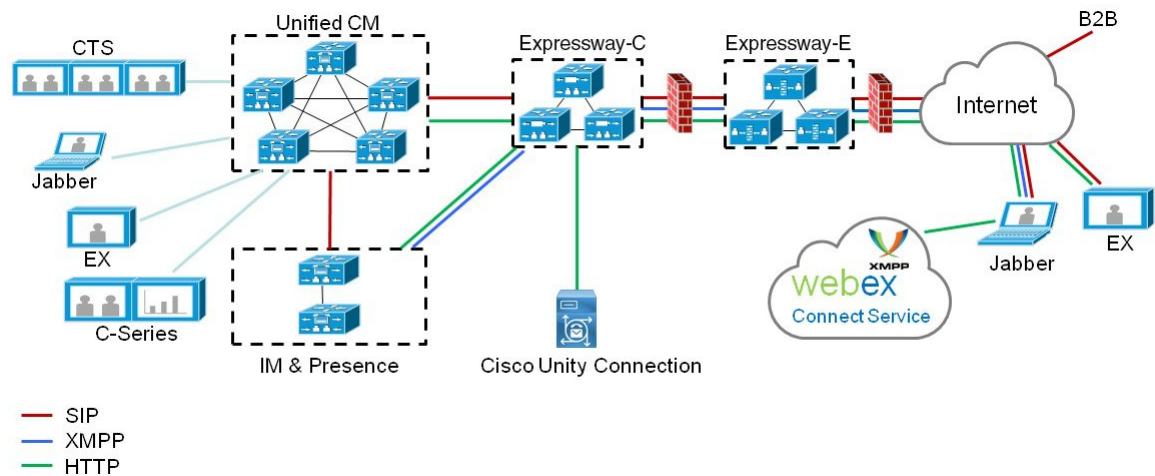
## About Mobile and Remote Access

Cisco Unified Communications Mobile and Remote Access (MRA) is part of the Cisco Collaboration Edge Architecture. MRA allows endpoints such as Cisco Jabber to have their registration, call control, provisioning, messaging, and presence services provided by Cisco Unified Communications Manager (Unified CM) when the endpoint is outside the enterprise network. The Expressway provides secure firewall traversal and line-side support for Unified CM registrations.

The MRA solution provides the following functions:

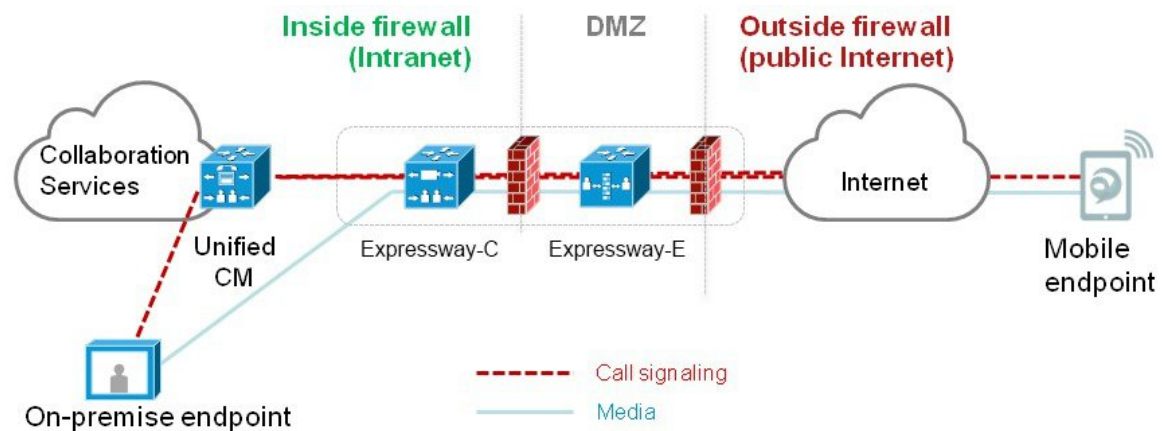
- **Off-premises access:** a consistent experience outside the network for Jabber and EX/MX/SX Series clients
- **Security:** secure business-to-business communications
- **Cloud services:** enterprise grade flexibility and scalable solutions providing rich Cisco Webex integration and service provider offerings
- **Gateway and interoperability services:** media and signaling normalization, and support for nonstandard endpoints

Figure 1: Unified Communications: Mobile and Remote Access



**Note** Third-party SIP or H.323 devices can register to the Expressway-C and, if necessary, interoperate with Unified CM-registered devices over a SIP trunk.

Figure 2: Typical Call Flow - Signaling and Media Paths



Unified CM provides call control for both mobile and on-premise endpoints. Signaling traverses the Expressway solution between the mobile endpoint and Unified CM. Media traverses the Expressway solution, which relays the media between the endpoints directly. All media is encrypted between the Expressway-C and the mobile endpoint.

## Change History

*Table 1: Change History*

Date	Change	Reason
December 2023	First published for X15.0. <ul style="list-style-type: none"> <li>• Included a section on "Push Notifications with Mobile Application Management Clients - MRA Deployments".</li> <li>• Included a section on "Webex Unified CM Calling Support Auto-extend Refresh Token".</li> <li>• Addressed CDETs.</li> </ul>	X15.0 release
May 2023	First published for X14.3. <ul style="list-style-type: none"> <li>• Included a section on "Enable IPv6 Over MRA".</li> <li>• Unified CM is able to resolve automatically added Expressway-C hostname as MRA solution.</li> <li>• Addressed CDETs.</li> </ul>	X14.3 release
August 2022	First published for X14.2. Moved a few related sections from the Release Note to this guide.	X14.2 release
May 2021	First published for X14.0. The following are the changes in this release: <ul style="list-style-type: none"> <li>• Webex Client Embedded Browser Support</li> <li>• SIP Registration Failover for Cisco Jabber - MRA Deployments</li> </ul>	X14.0 release
December 2020	First published for X12.7. The following are the changes in this release: <ul style="list-style-type: none"> <li>• Fast Path Registration for MRA (Caching Optimization for Registrations)</li> <li>• Webex VDI over MRA</li> </ul>	X12.7 release

Date	Change	Reason
October 2020	<p>First published for X12.6.3.</p> <p>The following are the changes in this release:</p> <ul style="list-style-type: none"> <li>• Multiple Presence Domains over MRA</li> <li>• MRA Documentation Enhancements: The Expressway MRA Deployment Guide has been updated and enhanced with the following new material: <ul style="list-style-type: none"> <li>• Multi-domain Scenarios — Overview, illustrations, and configuration summary designed to assist customers when deploying more complex topologies in a multi-domain environment.</li> <li>• Multi-cluster Scenarios — Best practices section with configuration tips and requirements for multi-cluster scenarios.</li> <li>• Security Requirements — Clarifies the Unified CM security prerequisite for deploying Mobile and Remote Access.</li> </ul> </li> <li>• Also included are updates and edits to the following sections: <ul style="list-style-type: none"> <li>• Call Recording and Silent Monitoring support</li> <li>• Key Expansion Module support</li> <li>• Supported Clients</li> <li>• Supported Endpoints</li> </ul> </li> </ul>	X12.6.3 release
September 2020	<p>First published for X12.6.2.</p> <p>The following are the changes in this release:</p> <ul style="list-style-type: none"> <li>• Support for Whisper Coaching and Whisper Announcements Over MRA</li> <li>• Support for Agent Greeting Over MRA</li> <li>• Android PUSH for IMP over MRA is Disabled by Default</li> </ul>	X12.6.2 release
July 2020	<p>First published for X12.6.1.</p> <p>The following are the changes in this release:</p> <ul style="list-style-type: none"> <li>• Display Active MRA Registrations Count</li> <li>• Support for BIB Silent Monitoring Over MRA</li> </ul>	X12.6.1 release

Date	Change	Reason
July 2020	A correction in the "Which MRA Features are Supported" section.	Document correction
June 2020	Updated for the X12.6 release.	X12.6 release
April 2020	Various clarifications and corrections to the guide.	Document corrections & enhancements
December 2019	Various clarifications to the guide: <ul style="list-style-type: none"> <li>• Reverse DNS requirement updates</li> <li>• TLS verify subject name requirement</li> <li>• Minimum TLS version pre-11.5(1)SU3</li> <li>• No call preservation if node fails</li> </ul>	Document corrections & enhancements
March 2019	Clarify that from X12.5, local DNS no longer requires _cisco-uds._tcp.<domain> SRV records (still recommended).	Document correction
February 2019	Clarify <b>UID</b> mapping is mandatory on IdP for single, cluster-wide SAML agreement.	Content enhancement
February 2019	Add Jabber 12.5 clients to supported endpoints for ICE passthrough (subject to Unified CM 12.5).	Software dependency change
January 2019	<ul style="list-style-type: none"> <li>• Fixed CE version for ICE support in MRA to 9.6.1 or later.</li> <li>• Removed Jabber endpoints from ICE for MRA supported components.</li> <li>• Correction to section <a href="#">Unsupported Expressway Features and Limitations</a> for ICE for MRA with Static NAT.</li> </ul>	Document correction
January 2019	Updated for X12.5.	X12.5 release
September 2018	Updated for X8.11.2 (change to <a href="#">Unsupported Expressway Features and Limitations</a> for chat/messaging if user authentication by OAuth refresh).	X8.11.2 release
September 2018	Updated for Webex and Spark platform rebranding, and for X8.11.1 maintenance release.  Added, to <a href="#">Unsupported Expressway Features and Limitations</a> section, a known issue with chat/messaging services over MRA if user authentication is by OAuth refresh (self-describing tokens).	X8.11.1 release  Clarification
July 2018	Included Hunt Group support, subject to Cisco Unified Communications Manager 11.5(1)SU5 or later fixed version.	Software dependency change

Date	Change	Reason
July 2018	Updated for X8.11. Also removed port reference topic, which is now available in the <i>Cisco Expressway IP Port Usage Guide</i> .	X8.11 release
May 2018	Clarify MFT over MRA is not supported when using an unrestricted version of IM and Presence Service.	Clarification
March 2018	Clarify no Jabber support for redundant UDS services.	Clarification
December 2017	Added configuration step to enable SIP protocol (disabled by default on new installs).	Content defect
November 2017	Clarified which Cisco IP Phones in the 88xx series support MRA (Configuration Overview section).	Content defect
September 2017	Added links to information about supported features for MRA-connected endpoints. Add information about Collaboration Solutions Analyzer.	Content enhancement
August 2017	Deskphone control functions bullet removed from “Unsupported Contact Center Features” as not applicable.	Content defect
July 2017	Clarify required versions for Unified Communications software. Corrected duplicated prerequisites for Push Notifications feature.	Content defect
July 2017	Updated.	X8.10 release
April 2017	Added details on partial support for Cisco Jabber SDK features.	Content defect
January 2017	Updated section on unsupported features when using MRA. Added description of Maintenance Mode. Clarified that Expressway-C and Expressway-E need separate IP addresses.	X8.9.1 release
December 2016	Updated.	X8.9 release
September 2016	Unsupported deployments section updated. Minimum versions note about TLS added.	Clarification to avoid misconfiguration
August 2016	Updated DNS prerequisite to create reverse lookup entries for Expressway-E.	Customer found defect
June 2016	HTTP Allow list feature updates.	X8.8 release
	Entries before X8.8 are removed for clarity	

## Related Documents

The following documents may help with setting up your environment:

- [Expressway Basic Configuration \(Expressway-C with Expressway-E\) Deployment Guide](#)
- [Expressway Cluster Creation and Maintenance Deployment Guide](#)
- [Certificate Creation and Use With Expressway Deployment Guide](#)
- [Cisco Expressway IP Port Usage Configuration Guide](#), on the [Cisco Expressway Series Configuration Guides](#).
- [Expressway Administrator Guide](#)
- [Configuration and Administration of IM and Presence Service on Cisco Unified Communications Manager](#), at [Cisco Unified Communications Manager Configuration Guides](#)
- “Directory Integration and Identity Management” chapter in the [Design Guides](#) (Cisco Collaboration System Solution Reference Network Designs (SRND)) document
- [SAML SSO Deployment Guide for Cisco Unified Communications Applications](#), at [Cisco Unified Communications Manager Maintain and Operate Guides](#)
- Jabber client configuration details:
  - [Cisco Jabber for Windows](#)
  - [Cisco Jabber for iPad](#)
  - [Cisco Jabber for Android](#)
  - [Cisco Jabber for Mac](#)

## Core Components

Any MRA solution requires Expressway and Unified CM, with MRA-compatible soft clients and/or fixed endpoints. The solution can optionally include the IM and Presence Service and Unity Connection. This guide assumes that you have already set up the following:

- A basic Expressway-C and Expressway-E configuration, as specified in the [Expressway Basic Configuration Deployment Guide](#) (The document describes the networking options for deploying Expressway-E in the DMZ.)
- Unified CM and IM and Presence Service are configured as specified in the configuration and management guides for your version, at [Cisco Unified Communications Manager Configuration Guides](#).
- If used, IM and Presence Service and/or Unity Connection are similarly configured as specified in the relevant [Cisco Unified Communications Manager Configuration Guides](#).

## Protocol Summary

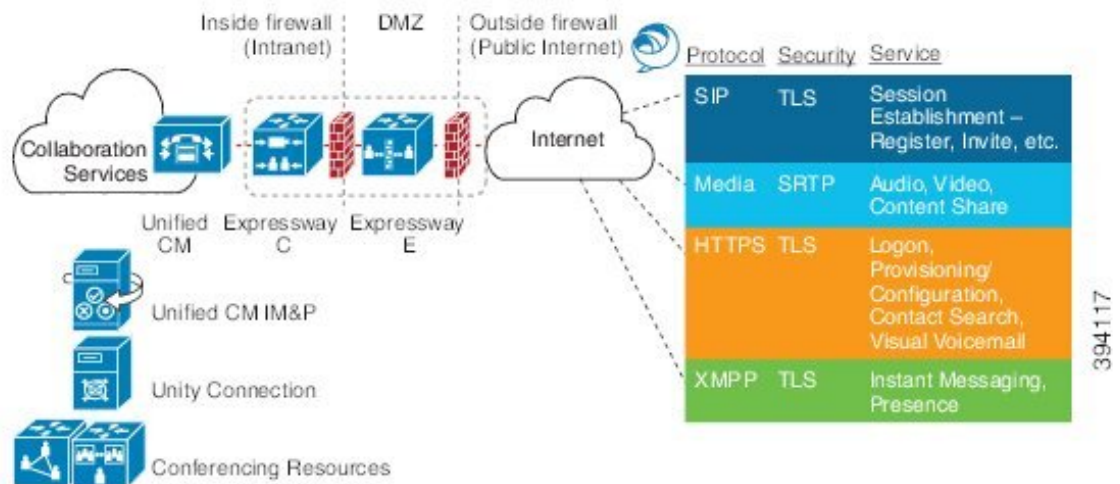
The following table lists the protocols and associated services used in the Unified Communications solution.

**Table 2: Protocols and Associated Services**

Protocol	Security	Services
SIP	TLS	Session establishment – Register, Invite etc.

Protocol	Security	Services
HTTPS	TLS	Logon, provisioning, configuration, directory, Visual Voicemail
Media	SRTP	Media - audio, video, content sharing
XMPP	TLS	Instant Messaging, Presence, Federation

Figure 3: Protocol Workload Summary



## Jabber Client Connectivity Without VPN

The MRA solution supports a hybrid on-premises and cloud-based service model, providing a consistent experience inside and outside the enterprise. MRA provides a secure connection for Jabber application traffic and other devices with the required capabilities to communicate without having to connect to the corporate network over a VPN. It is a device and operating system agnostic solution for Cisco Jabber clients on Windows, Mac, iOS and Android platforms.

MRA allows Jabber clients that are outside the enterprise to do the following:

- Use Instant Messaging and Presence services
- Make voice and video calls
- Search the corporate directory
- Share content
- Launch a web conference
- Access visual voicemail



**Note** Cisco Jabber Video for TelePresence (Jabber Video) does not work with MRA.



## Deployment Scenarios

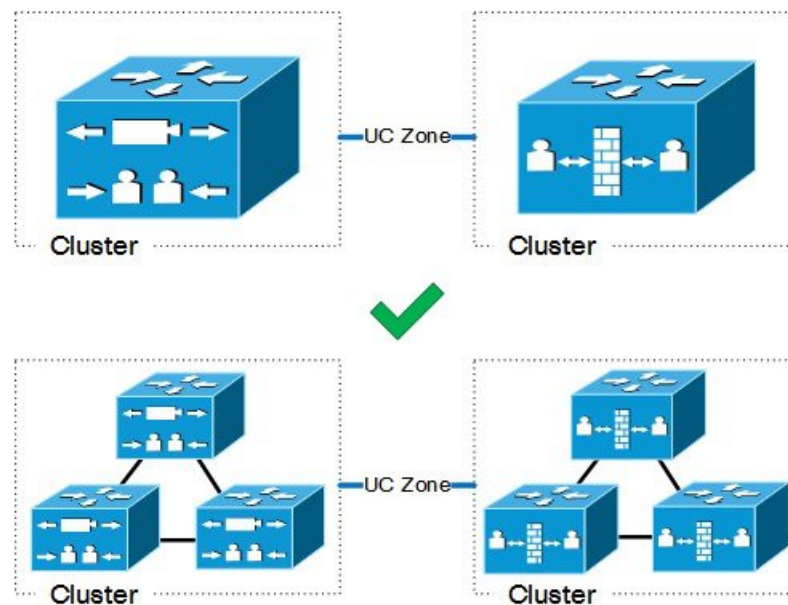
This section describes the supported deployment environments:

- Single network elements
- Single clustered network elements
- Multiple clustered network elements
- Hybrid deployment



**Note** The only supported Mobile and Remote Access deployments are based on one-to-one Unified Communications zones between Expressway-C clusters and Expressway-E clusters.

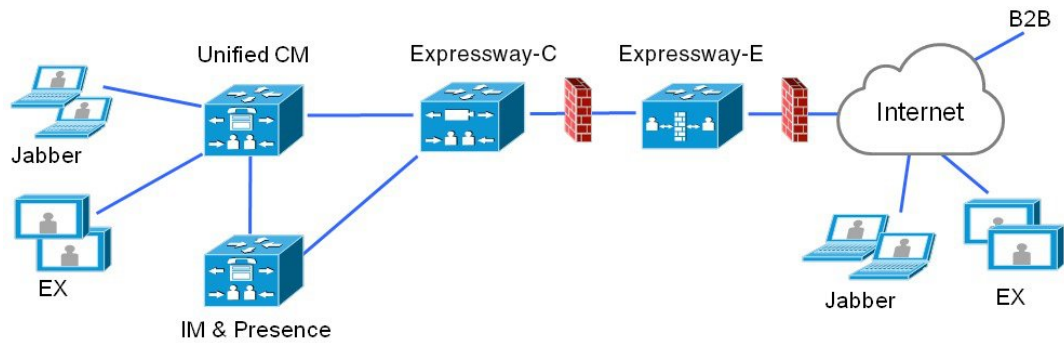
**Figure 4: Supported MRA Traversal Connections**



## MRA with Standalone Network Elements

This scenario includes standalone (non-clustered) Unified CM, IM and Presence Service, Expressway-C, and Expressway-E servers.

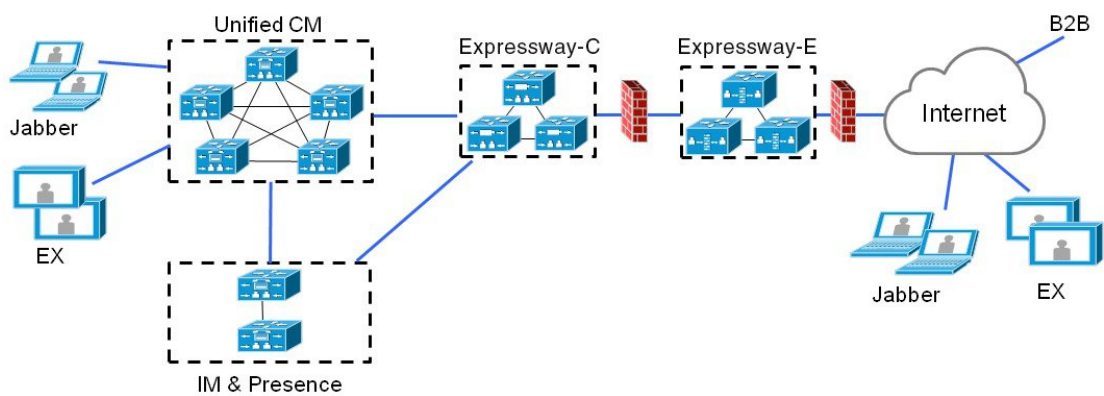
Figure 5: Standalone Network Elements



## MRA with Clustered Network

In this scenario, each network element is clustered.

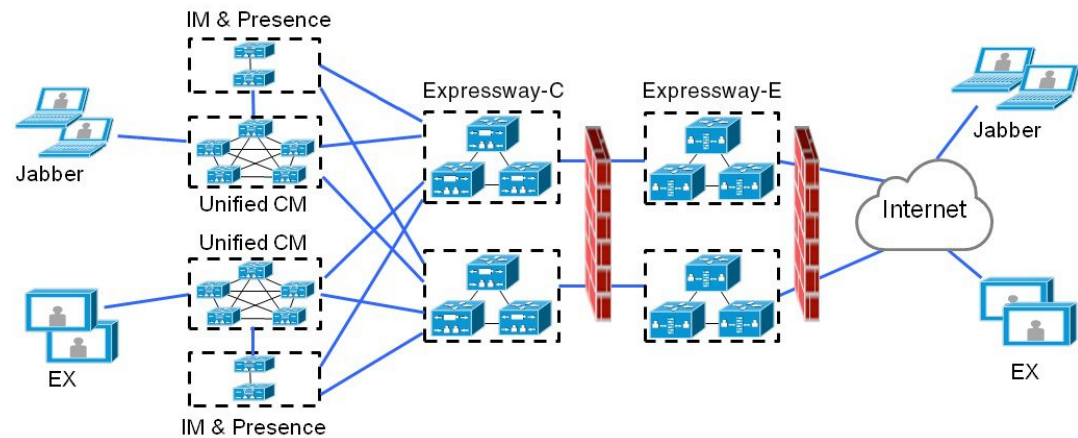
Figure 6: Single Clustered Network Elements



## MRA with Multiple Clustered Networks

In this scenario, there are multiple clusters of each network element.

Figure 7: Multiple Clustered Network Elements



- Jabber clients can access their own cluster through any route.
- Expressway-C uses round robin to select a node (publisher or subscriber) when routing home cluster discovery requests.
- Each combination of Unified CM and IM and Presence Service clusters must use the same domain.
- Intercluster peering must be set up between the IM and Presence Service clusters, and the Intercluster Sync Agent (ICSA) must be active.

### Multiple Unified CM Clusters

If your MRA deployment includes multiple Unified CM clusters, configure Home Cluster Discovery for Unified CM. Expressway-C requires this configuration to direct MRA users to the correct home Unified CM cluster. Use either of the following configuration methods:

- Configure an Intercluster Lookup Service (ILS) network between your remote Unified CM clusters. ILS cluster discovery finds and connects your remote Unified CM clusters into an intercluster network, populating the Cluster View on each cluster. ILS is the preferred option for larger intercluster networks, and also if you also want to replicate your enterprise dial plan across all Unified CM clusters. However, note that MRA doesn't require dial plan replication to work.
- Configure each Unified CM cluster with a list of all the remote clusters under the Unified CM **Advanced Features** > **Cluster View** menu. This option does not allow for dial plan replication.

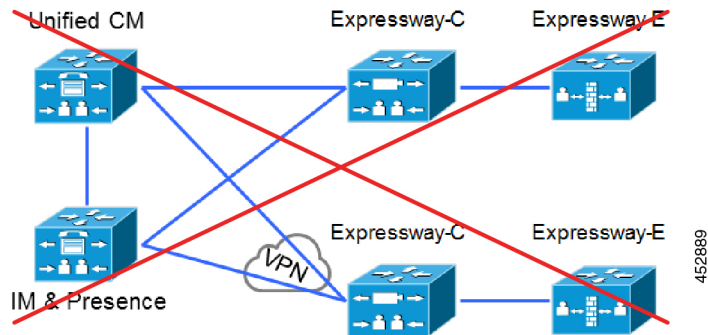
## Unsupported Deployments

This topic highlights some deployments that are not supported over MRA.

### VPN Links

MRA doesn't support VPN links between the Expressway-C and the Unified CM services / clusters.

Figure 8: VPN Links Unsupported

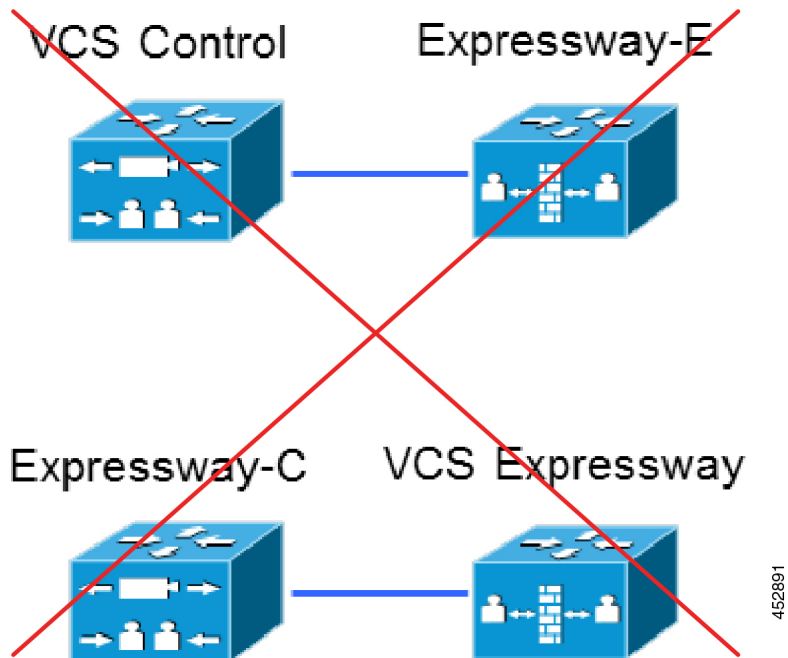


### Traversal Zones Between VCS Series and Expressway Series

MRA doesn't support "Mixed" traversal connections. Even though it's possible to configure traversal zones between Cisco VCS and Cisco Expressway, MRA doesn't support them.

Explicitly, we don't support VCS Control traversal to Expressway-E, nor do we support Expressway-C traversal to VCS Expressway.

Figure 9: Mixed Traversal Zones

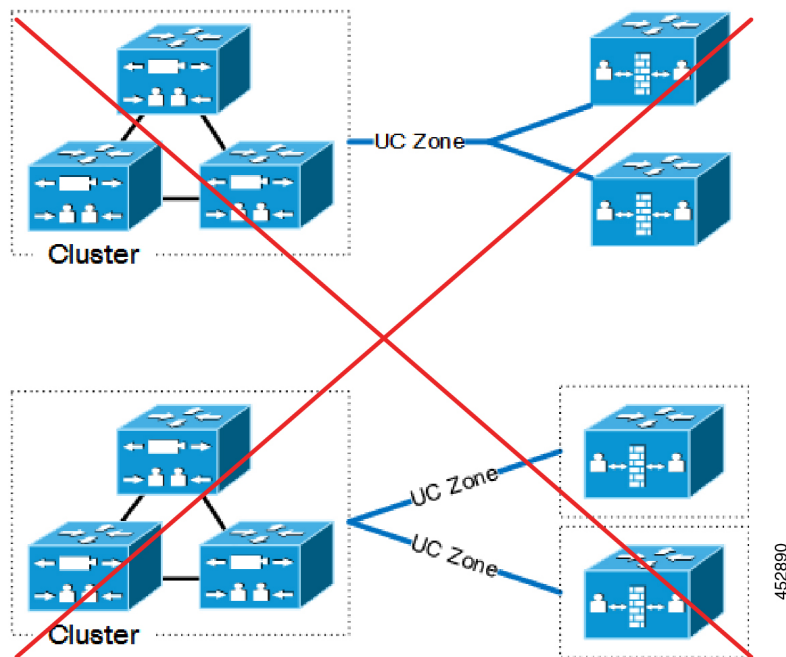


### Unclustered or Many-to-One Traversal Connections

We don't support Unified Communications zones from one Expressway-C cluster to multiple unclustered Expressway-Es.

We also don't support multiple Unified Communications zones from one Expressway-C cluster to multiple Expressway-Es or Expressway-E clusters.

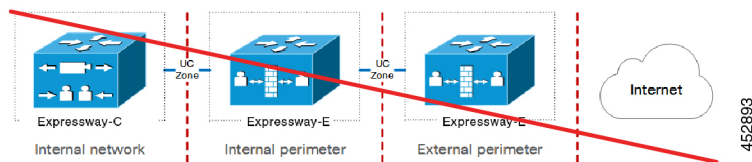
**Figure 10: Unclustered or Many-to-One Traversal Connections**



**Nested Perimeter Networks**

MRA doesn't support chained traversal connections (using multiple Expressway-Es to cross multiple firewalls). You can't use Expressway-E to give Mobile and Remote Access to endpoints that must traverse a nested perimeter network to call internal endpoints.

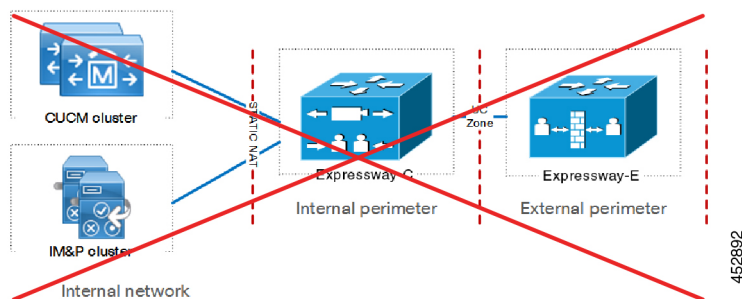
**Figure 11: Nested Perimeter Networks**



**Expressway-C in DMZ with Static NAT**

We don't support Expressway-C in a DMZ that uses static NAT. Static NAT firewall traversal requires SDP rewriting, which Expressway-C doesn't support—use the Expressway-E instead.

Figure 12: Expressway-C in DMZ with Static NAT



## Unsupported Expressway Combinations

The following major Expressway-based deployments don't work together. You can't implement them together on the same Expressway (or traversal pair):

- Mobile and Remote Access
- Microsoft interoperability, using the Expressway-C-based B2BUA
- Jabber Guest services

## Capacity Information

For details on MRA registration limits and other capacity information, refer to “Cluster License Usage and Capacity Guidelines” section in *Cisco Expressway Administrator Guide* at [Expressway configuration guides](#) page.