Cisco Unified Web and E-Mail Interaction Manager Solution Reference Network Design Guide

For Unified Contact Center Enterprise

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Preface

- About This Guide
- Obtaining Documentation and Submitting a Service Request
- Documentation Feedback
- Field Alerts and Field Notices
- Document Conventions
- List of Acronyms and Initialisms
- Other Learning Resources

Welcome to Cisco® Unified EIM and WIM™, multichannel interaction software used by businesses all over the world to build and sustain customer relationships. A unified suite of the industry's best applications for web and email interaction management, it is the backbone of many innovative contact center and customer service helpdesk organizations.

Cisco Unified EIM and WIM includes a common platform and one or both of the following applications:

- Cisco Unified Web Interaction Manager (Unified WIM)
- Cisco Unified E-Mail Interaction Manager (Unified EIM)

About This Guide

Cisco Unified Web and E-Mail Interaction Manager Solution Reference Network Design Guide is intended for engineers, system architects, and other technical audience responsible for planning the deployment and maintenance of Cisco Unified EIM and WIM for Cisco Unified Contact Center Enterprise (Unified CCE).

The document is designed to provide an overview of the system, system architecture, system flow for different types of interactions, deployment models, sizing guidelines, high-availability and load-balancing options, network latency considerations, firewall and hardening considerations, and interface boundaries.

For sizing guidelines for servers used in the Unified CCE deployment, refer to the Unified CCE SRND guide available here: http://www.cisco.com/go/srnd.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see *What's New in Cisco Product Documentation*, at: http://www.cisco.com/c/en/us/td/docs/general/whatsnew/whatsnew.html.

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Log into www.cisco.com and then access the tool at http://www.cisco.com/cisco/support/notifications.html

Document Conventions

This guide uses the following typographical conventions.

Convention	Indicates
Italic	Emphasis. Or the title of a published document.
Bold	Labels of items on the user interface, such as buttons, boxes, and lists. Or text that must be typed by the user.
`Monospace`	The name of a file or folder, a database table column or value, or a command.
Variable	User-specific text; varies from one user or installation to another.

Document conventions

List of Acronyms and Initialisms

Acronyms and initialisms used in this document are listed here:

- **ARM Interface**: Agent Reporting and Management Interface
- **AAS**: Agent Assignment Service
- **BAPI:** Blender Application Programming Interface
- **CSA**: Cisco Security Agent
- **CTI:** Computer Telephony Integration
- **DB**: Database
- **DSM**: Distributed Services Manager
- **EAAS**: External Agent Assignment Service
- **EMS**: Event Management Service
- **HA**: High Availability
- **IPCC**: Internet Protocol Contact Center

- **ICM**: Intelligent Contact Manager
- **LAS**: Live Application Servlet
- **MR Interface**: Media Routing Interface
- **MRD**: Media Routing Domain
- **PG**: Peripheral Gateway
- **PIM**: Peripheral Interface Manager
- **SLA**: Service Level Agreement
- **TES:** Task Event Services
- **Unified CCE**: Cisco Unified Contact Center Enterprise
- **Unified EIM**: Cisco Unified E-Mail Interaction Manager
- **Unified WIM**: Cisco Unified Web Interaction Manager
- **UI**: User Interface

Other Learning Resources

Various learning tools are available within the product, as well as on the product CD and our web site. You can also request formal end-user or technical training.

Online Help

The product includes topic-based as well as context-sensitive help.

Use	To view
Help button	Topics in *Cisco Unified Web and E-Mail Interaction Manager Help*; the Help button appears in the console toolbar on every screen.
F1 keypad button	Context-sensitive information about the item selected on the screen.

Online help options

Document Set

The latest versions of all Cisco documentation can be found online at http://www.cisco.com

- All Unified EIM documentation can be found online at http://www.cisco.com/en/US/products/ps7236/tsd_products_support_series_home.html
- All Unified WIM documentation can be found online at http://www.cisco.com/en/US/products/ps7233/tsd_products_support_series_home.html
- In particular, Release Notes for these products can be found at http://www.cisco.com/en/US/products/ps7236/prod_release_notes_list.html

- For general access to Cisco Voice and Unified Communications documentation, go to http://www.cisco.com/en/US/products/sw/voicesw/tsd_products_support_category_home.html

The document set contains the following guides:

- *Hardware and System Software Specification for Cisco Unified Web and E-Mail Interaction Manager*
- *Cisco Unified Web and E-Mail Interaction Manager Solutions Reference Network Design Guide*
- *Cisco Unified Web and E-Mail Interaction Manager Installation Guide*
- *Cisco Unified Web and E-Mail Interaction Manager Browser Settings Guide*

User Guides for Agents and Supervisors

- *Cisco Unified Web and E-Mail Interaction Manager Agent's Guide*
- *Cisco Unified Web and E-Mail Interaction Manager Supervisor's Guide*

User Guides for Knowledge Base Managers and Authors

- *Cisco Unified Web and E-Mail Interaction Manager Knowledge Base Author's Guide*

User Guides for Administrators

- *Cisco Unified Web and E-Mail Interaction Manager Administrator's Guide to Administration Console*
- *Cisco Unified Web and E-Mail Interaction Manager Administrator's Guide to Routing and Workflows*
- *Cisco Unified Web and E-Mail Interaction Manager Administrator's Guide to Chat and Collaboration Resources*
- *Cisco Unified Web and E-Mail Interaction Manager Administrator's Guide to Email Resources*
- *Cisco Unified Web and E-Mail Interaction Manager Administrator's Guide to Offers Console*
- *Cisco Unified Web and E-Mail Interaction Manager Administrator's Guide to Data Adapters*
- *Cisco Unified Web and E-Mail Interaction Manager Administrator's Guide to Reports Console*
- *Cisco Unified Web and E-Mail Interaction Manager Administrator's Guide to System Console*
- *Cisco Unified Web and E-Mail Interaction Manager Administrator's Guide to Tools Console*

1 System Overview

- Cisco Unified E-Mail Interaction Manager (Unified EIM)
- Cisco Unified Web Interaction Manager (Unified WIM)
- Cisco Unified EIM and WIM for Unified CCE
- Basic and Advanced Packages of Cisco Unified EIM and WIM
- Feature Matrix for Standalone and Integrated Deployments

Cisco Unified Email Interaction Manager (Unified EIM) and Cisco Unified Web Interaction Manager (Unified WIM) are key application components that are part of an integrated suite of applications known as Cisco® Unified EIM and WIM.

Cisco Unified EIM and WIM helps businesses set up multichannel customer interaction hubs to provide consistent high quality service across all interaction channels such as email, chat, and phone. Users can efficiently administer and manage rich knowledge base repositories, departments, queues, business workflows, and data adapters. Historical reporting across channels is also available from a single Reports Console.

The integration between Cisco Unified EIM and WIM and Unified CCE helps address the multichannel handling needs of traditional call centers.

Cisco Unified E-Mail Interaction Manager (Unified EIM)

Cisco Unified EIM enables organizations to intelligently route and process inbound emails, webform inquiries, faxes, and letters.

Key features and capabilities include:

- Business workflows to manage incoming email and webform requests across different teams, with the ability to set service level agreement (SLA) targets for call center service efficiency.
- Intelligent parsing of all incoming email content, to generate auto-responses and suggest useful responses to agents.
- Complete display of customer information and interaction history for agents, across media channels, there by enabling informed interactions.
- A common knowledge base that enables agents to accurately resolve complex inquiries and processes, interacting directly with data sources and devices where required. Agents can also contribute to the knowledge base.
- Varied collaboration options with experts within and outside the system.
- Web-based consoles for a range of users such as agents, supervisors and managers, business analysts, knowledge authors, programmers, and system administrators.
- Comprehensive analytics, real-time alarms, and monitors for operational performance management.

Cisco Unified Web Interaction Manager (Unified WIM)

Cisco Unified WIM provides agents with a comprehensive set of tools for serving customers in real-time. It enables call center agents to provide immediate personalized service to customers through text chat messaging and web page-pushing. Agents also use Unified WIM to assist customers to navigate through web pages while providing support on the phone.

Key features and capabilities include the ability to:

- Exchange text messages and web pages with customers.
- Web callback capabilities for agents and customers.
- Integrate with other channels, while using a common knowledge base, customer view and customer history.
- Handle interactions from multiple channels such as chat, and callback from the Agent Console. This console supports a single login to Unified EIM and Unified WIM queues (MRD), with a single-click common logout.
- Tag multiple activities together, irrespective of the channel or when they were created, using case management features.
- Service multiple chats at the same time, along with page-push, from one unified Agent Console.

Cisco Unified EIM and WIM for Unified CCE

The Cisco Unified EIM and WIM and Unified CCE integration provides agents with the capability to selectively handle email, chat, and phone requests using a unified system that includes both applications. Some of the key points of the integration include:

- An integration wizard to selectively download relevant configuration data such as MRDs, Agents, and Skill Groups from Unified CCE, and to map these to objects in Cisco Unified EIM and WIM.
- The ability for agents to launch Cisco Unified EIM and WIM within Cisco Finesse, and work with email, chat, and voice using a unified interface.
- User authentication for agents in Cisco Unified EIM and WIM through Unified CCE.
- The ability to alert users using a pop-up window when a new email or chat activity is assigned to them.
- An External Agent Assignment Service (EAAS) and a Listener Service to facilitate routing and reporting via Unified CCE.
- A reliable channel for communication, through session management, between Cisco Unified EIM and WIM, and the MR and ARM, and BAPI interfaces.
- The availability of the integration as two Cisco Unified EIM and WIM packages, Basic and Advanced. Basic licenses can be upgraded to Advanced, but an Advanced license cannot be downgraded to a Basic one.

Basic and Advanced Packages of Cisco Unified EIM and WIM

The basic editions of Unified WIM and Unified EIM contain fewer features than the advanced editions. All Cisco Unified EIM and WIM documents describe features and functionality available in the advanced editions. Features that are not available in the basic editions are listed in this section.

Unified WIM Basic

Unified WIM Basic does not include the following features. These features are present in Unified WIM Advanced.

- **Ability to define custom activities**: The basic edition allows the creation of only chat type of activities, and supports incoming callback type of activities.
- **Ability to define custom attributes for business objects**: The basic edition provides only the standard attributes for business objects such as the customer or user object.
- **Ability to add custom fields or change the order of fields on screens**: The user interface cannot be changed in the basic edition.
- **Ability to create user roles**: The basic edition provides only the standard roles.
- **Use of certain types of data links**: Only JDBC data links are available in the basic edition.
- **Use of proxy server**: The basic edition only allows simple page-pushing.

Unified EIM Basic

Unified EIM Basic does not include the following features. They are present in Unified EIM Advanced.

- **Ability to add departments**: The basic edition contains one department. Additional departments cannot be added.
- **Ability to define custom activities**: The basic edition allows the creation of only email type of activities.
- **Ability to define custom attributes for business objects**: The basic edition provides only the standard attributes for business objects such as the customer or user object.
- **Ability to add custom fields or change the order of fields on screens**: The user interface cannot be changed in the basic edition.
- **Ability to create user roles**: The basic edition provides only the standard roles.
- **Use of certain types of data links**: Only JDBC data links are available in the basic edition.
- **Use of advanced workflow features**: The basic edition does not include the ability to add custom rules, create outbound and general workflows, or manage tasks with workflows.

Feature Matrix for Standalone and Integrated Deployments

Cisco Unified EIM and WIM supports both integrated and standalone deployment methods. Customers can choose the deployment method that best matches their multichannel contact center needs. The following table provides a quick view of the features that are available in each deployment.

Feature	Integrated Deployment	Standalone Deployment
Inbound email	Yes	Yes
Outbound email	Yes	Yes
Inbound chat	Yes	Yes
Web callback	Yes	No
Interruptibility (e.g. Voice or chat interrupts email)	Yes	Yes
Dynamic Wait Time Configuration (previously known as Dynamic Run Application Script Request (DRASR)	Yes	No
Universal queuing	Yes	No
Pull and pick activities from same or other queue	Yes	Yes
Search capability	Yes	Yes
Search-based activity transfer	No	Yes
Supervisory transfer of activities in agent's inbox	Yes	Yes
Interdepartmental transfer of activities	Yes	Yes
Standalone routing	No	Yes
Non-ICM Picks the Agent (NIPTA) routing	Yes (For email and chat only)	No
ICM Picks the Agent (IPTA) routing	Yes	No
Agent availability considered when displaying Chat entry points	No	Yes
Automatic pushback for emails	Yes	Yes
Automatic pushback for chat	Yes	Yes
Alarm workflow that can act on users	No (but alarm workflows act on integrated queues)	Yes (but not supported for supervisor queues)
Supervisory loop for outbound email review	Yes	Yes

Feature	Integrated Deployment	Standalone Deployment
Department sharing	No (But integrated agents can transfer activities to integrated queues in foreign departments.)	Yes
User administration	Yes (The Administration Console allows an administrator to add users, keep users as standalone, or integrate user manually with an ICM user)	Yes
User group administration	Yes (But the visibility of agents under IPTA user/skill groups is available only in Unified CCE)	Yes
Queue administration	Yes	Yes
Queue new chats when all agents are at maximum load	Yes	Yes
Sticky agent functionality	Yes	Yes
Exception queue access	Yes (Mapped administrators can pull from the Exception queue. Access is also available through alarm workflows)	Yes
Knowledge Base suggestion and authoring	Yes	Yes
Knowledge Base approval process	Yes (Allows IPTA users, but not IPTA user groups, to be part of the approval process)	Yes
Data adapters	Yes	Yes
Unified EIM and WIM historical reports	Yes (Available from the Reports Console)	Yes
Unified EIM and WIM realtime reports	No (But realtime reports are available from Unified CCE)	Yes
Monitoring Queues	Yes. (Activities that have been fetched by EAAS, and activities queued in Unified CCE are not included in the count)	Yes

Feature	Integrated Deployment	Standalone Deployment
Impact of interruptibility	▸ On Unified EIM and WIM historical reports: None ▸ On CUIC realtime reports: Yes	Not applicable
Impact of Media Routing/CTI failover	▸ On Unified EIM and WIM historical reports: None ▸ On CUIC realtime reports: Yes ▸ On CUIC historical reports: Yes	Not applicable
Impact of Callback call flows	▸ On Unified EIM and WIM historical reports: Yes (Limited to Callback Volume Reports) ▸ On CUIC realtime reports: Yes	Not applicable

2 System Architecture

- Cisco Unified EIM and WIM Components
- Architecture Overview
- Communication Protocols Among Components
- Port Number Configuration Between Components
- Integration Between Cisco Unified EIM & WIM and Unified CCE
- Interface Boundaries

Cisco Unified EIM and WIM is an enterprise class application built on native web-centric architecture. It helps enterprises address business-critical tasks, while offering an unmatched array of resources and response tools. It is built in a modular component-based architecture, combining superior design with easy maintainability.

Cisco Unified EIM and WIM Components

A Cisco Unified EIM and WIM installation has the following six components:

- Database Server
- Web Servers
- Application Servers
- File Server
- Services Server
- Messaging Server

These components can be installed in any of the following types of configurations.

- Single-server, where all the components are on the same machine.

  For Unified WIM, a collocated variation of this is supported, where the web server is on a separate machine.

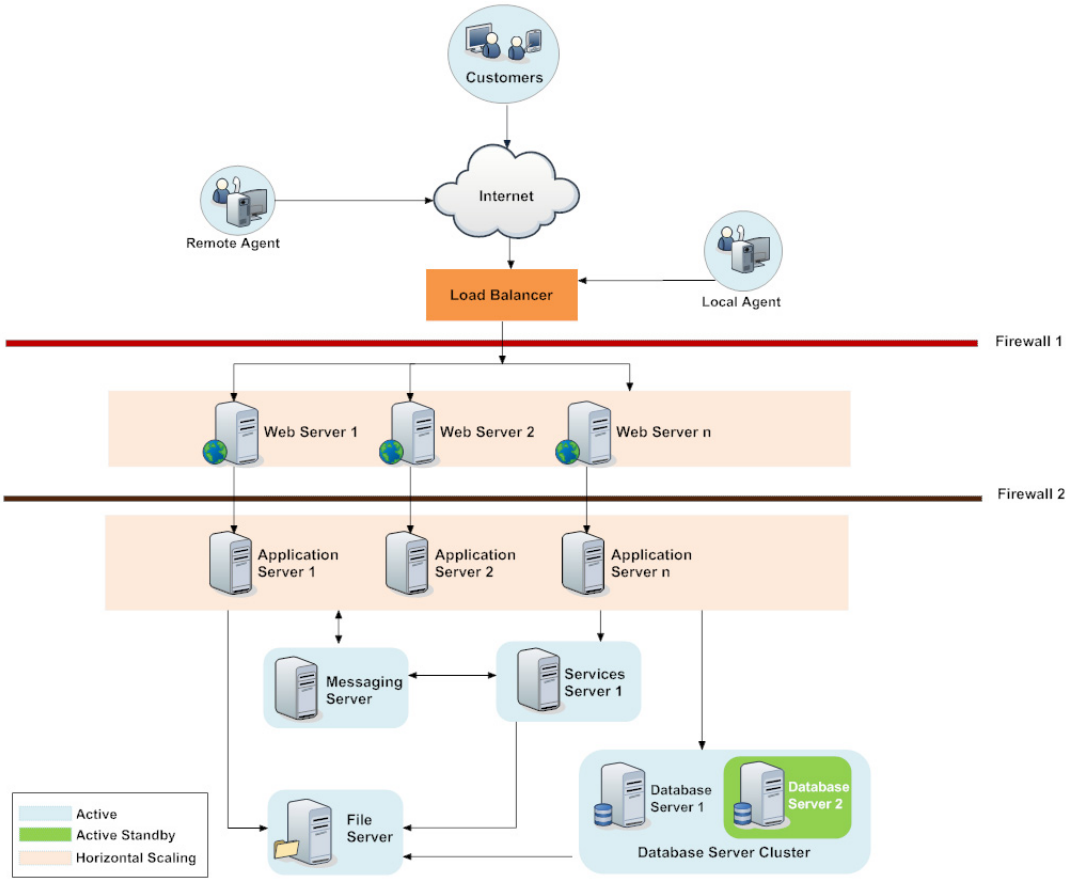
- Distributed-server, where each component is on a different machine.

  For Unified EIM, the web and application server pairs can be installed on the same machine.

For details about these configuration options, see the *Cisco Unified Web and E-Mail Interaction Manager Installation Guide*.

Architecture Overview

This section describes the system architecture of Cisco Unified EIM and WIM.



Cisco Unified EIM and WIM system architecture

Agents and Customers

Cisco Unified EIM and WIM is a 100% web-based product that agents and end-customers can access using a web browser from their respective desktops.

Agents can access the application using Microsoft Internet Explorer, or from within the Finesse desktop, and customers can access the chat customer console using specific versions of Microsoft IE, Mozilla Firefox, or Chrome. For information on browser support, see the *Hardware and System Software Specification for Cisco Unified Web and E-Mail Interaction Manager*.

Firewall and Load Balancer

To enforce stricter control over access to specific Cisco Unified EIM and WIM servers, a firewall may be configured by a system administrator. The firewall can be configured between the web and application servers (as in the case of Unified WIM deployments), or behind the web servers to limit access to the web servers from unknown IP addresses.

A load balancer may also be used in a distributed installation of the application so that requests from agents and customers are either routed to the least-loaded web servers, or evenly distributed across all the available web servers.

Web Servers

The web server is used to serve static content to the browser.

Application Servers

The application server is used as a web container (JSP/servlet engine) and EJB Container. The core business logic resides here as well as in the stored procedures residing on the database server. The business logic residing in JAVA classes is deployed on the application server. The JSP/servlets interact with the business objects through the business client layer, and these in turn interact with the database to execute relevant business logic on data present in the database.

File Server

The file server is used to store reports templates, reports output, license files, and startup scripts. There is only one file server in a configuration.

Services Server

Cisco Unified EIM and WIM has processes that perform specific business functions, such as fetching emails from a POP3 or IMAP server, sending emails through an SMTP server, processing workflows, assigning chats to the standalone agents, maintaining integrated connections to the ICM server, etc. All services run on the services server and are managed by the Distributed Service Manager (DSM). There is only one services server in a configuration.

Cisco Unified EIM and WIM facilitates the creation of multiple instances of services with work distributed among the various instances. For instance, the service used to retrieve emails could be configured to have multiple instances to retrieve emails from different email addresses. This capability can be used to process increasing volumes of customer interactions coming into a contact center.

Messaging Server

The messaging server provides a centralized location for the exchange of information asynchronously among various components of the application through the sending and receiving of messages. In the application, java messaging clients use the publisher-subscriber model to interact with each other, and the messaging server controls these interactions. There is only one messaging server in a configuration.

Database Server

All Cisco Unified EIM and WIM databases are created on the database server.

The installation program creates the following databases:

- A master database, that stores system configuration information to manage services.
- An active database, where all business and interaction data is stored. This is also referred to as the partition database.
- An archive database, where all archived data is stored. This database is created only in deployments that use the standard edition of MSSQL Server.
- A reports database, where all data used by the reports module is stored. This database is created only in deployments that use the enterprise edition of MSSQL Server.
- MS SQL Server clustering is supported, and can be used to achieve failover for the databases.

The master and active databases must be installed on the same machine. The archive and reports databases can be installed on different machines.

Unified CCE Integration

As part of the system integration with Unified CCE, the services server has two additional services, the External Agent Assignment Service (EAAS) and the Listener Service. These services interact with the MR PG and CTI Server components of Unified CCE respectively via the MR, ARM, and BAPI interfaces.

Additionally, the Cisco Unified EIM and WIM application server component establishes a connection with the Unified CCE Administration Workstation (AW) database server to import relevant configuration, and map the configuration to business objects in the Cisco Unified EIM and WIM database. For details see the architecture diagram for the Cisco Unified EIM and WIM integration with Unified CCE on page 24.

In parent-child configurations, there is no multi-channel routing and integration through the parent ICM. MR PG's need to connect to the child CCE. A separate Cisco Unified EIM and WIM installation is required for each child.

In hosted ICM/CCH environments, there is no multi-channel routing through the NAM. Integration is at the CICM level only. MR PGs needs to connect to the CICM.

Communication Protocols Among Components

Browser-Server Communication

Since the Cisco Unified EIM and WIM consoles are all web-based, all communication between the browser and the server is conducted using HTTP. The SSL variant of HTTP, HTTPS, is supported for agent browsers to access the application through a Secure Socket Layer. There is neither custom encryption, nor compression, on data that is transferred between the browser and server.

Server-Browser Event Publishing

Although request-response communication from browser-server is common, server-side “push” of events and other critical information is achieved via “pushlets”, a framework unique to Cisco Unified EIM and WIM. Using this robust server-side-to-browser push framework, one could publish key events to connected browser clients. It also allows browser clients to subscribe to specific topics and be notified when messages arrive for those topics.

Communication Between Distributed Components

Cisco Unified EIM and WIM includes a complex distributed framework of remote objects that communicate with each other. The primary communication protocol employed is “remote method invocation (RMI)”, an integral part of the J2EE platform.

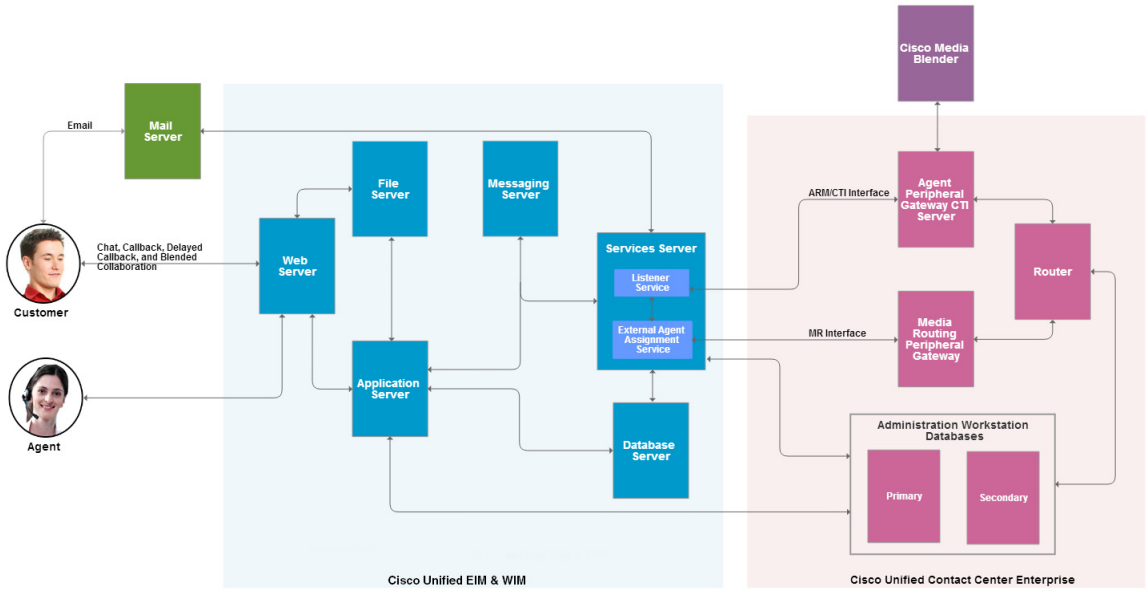
Port Number Configuration Between Components

Various inbound and outbound ports need to be opened for the flow of requests between the various components within a deployment. For more information on the ports that must be configured, please see the *Cisco Unified Web and E-Mail Interaction Manager Installation Guide*.

Integration Between Cisco Unified EIM & WIM and Unified CCE

The key interfaces used in the integration are Media Routing (MR) Interface, Agent and Reporting and Management (ARM) Interface, and the Blender Application Programming Interface (BAPI).

In the integration architecture depicted here the communication between Cisco Media Blender and Agent Peripheral Gateway is applicable only if you are using Unified CCE versions 9.0(1) to 9.0(4).



Unified CCE integration architecture

For a two-way socket connection from an MR PG to the EAAS through the MR interface, an MR PIM needs to be setup in Unified CCE by running the ICM setup utility. The MR PIM needs to be configured with the fully qualified host name or IP address of the Cisco Unified EIM and WIM services server.

For a two-way socket connection from the Listener Service to the CTI server through the ARM interface, which embeds an Agent PG, the primary and/or secondary CTI servers need to be configured for the Agent PG using ICM Configuration Manager. Additionally, the Agent PIM of the Agent PG/CTI Server listens to incoming socket connection requests from the Listener Service, and therefore the Agent PIM needs to be configured too using the ICM setup utility.

Both the MR PG and CTI Server of Unified CCE support duplex connections with Cisco Unified EIM and WIM components for high availability. Using the Unified CCE setup utility, the administrator has the option to install side A and side B for these components to establish duplex capability.

For the MR PG, either side A or side B of the MR PIM can be active at a given point, and this active side stays connected to the EAAS, while the other side remains idle. If this MR PIM side fails, the other side automatic initiates a connection with the EAAS to restore functionality seamlessly.

Likewise, the Listener Service stays connected to a single active side of the Agent PIM, corresponding to the Agent PG/CTI Server, while the other Agent PIM side remains idle. If the active Agent PIM side fails or goes idle, the Listener Service automatically initiates a connection with the other side, which then becomes active.

Microsoft Active Directory Dependency

Unified CCE uses Microsoft Active Directory for managing the ICM instances, and ICM objects that have been created under the respective instances. For information about Unified CCE and Microsoft Active Directory configuration, refer to the Unified CCE SRND guide at www.cisco.com/go/srnd.

Interface Boundaries

This section describes the various external interfaces and key components used to facilitate the integration between the two systems.

Key Protocols

The key protocols involved in the integration are outlined in this section. These are:

- TCP
- HTTP/HTTPS
- ODBC

TCP

TCP is the protocol used for socket communication between Cisco Unified EIM and WIM and the key interfaces of Unified CCE, namely, MR and ARM. A TCP socket connection establishes the communication channel for messaging.

HTTP/HTTPS

Cisco Unified EIM and WIM supports a non-secure connection from browsers to the web server through HTTP, or a secure connection through HTTPS.

ODBC

ODBC is the protocol used by the Cisco Unified EIM and WIM Integration Wizard and Cisco Unified EIM and WIM to connect to ICM Configuration database that further facilitates the selective download of configuration data into Cisco Unified EIM and WIM.

Key Components

The key components of the integration are outlined in this section. These are:

- Cisco Unified EIM and WIM
- ICM Interfaces

Cisco Unified EIM and WIM

External Agent Assignment Service

- The External Agent Assignment Service acts as the TCP server for incoming connections from the MR PG through the MR interface of Unified CCE, and accepts a successful connection.

- This service fetches new tasks that arrive into an external routing queue in Cisco Unified EIM and WIM, and is responsible for submitting a route request for each task to Unified CCE, for identification of a target agent or skill group.

Listener Service

- The Listener Service acts as the TCP client for initiating connections to the CTI Server through the ARM interface of Unified CCE.
- The service has the capability to support multiple instances, with each instance dedicated to communicate with a single Agent PG/CTI Server through the ARM interface. An Agent PG can be an IPCC/CCM PG, or a non-voice PG.
- Each instance is responsible for reporting the current state of an agent and task based on agent UI operations, to the Agent PG/CTI Server to which the agent belongs.

Cisco Unified EIM and WIM Integration Wizard

- The integration wizard is used for establishing mappings between Cisco Unified EIM and WIM and Unified CCE configuration objects that are needed to create a unified system for integrated routing, assignment, and reporting.
- The wizard allows the user to select configurations to import, such as application instance name, Unified CCE peripherals, Unified CCE MRDs, Unified CCE Skill Groups, etc. Upon saving the selected configurations, the system is considered to be integrated.

ICM Interfaces

Media Routing Interface and Agent Reporting and Management Interface

Media Routing (MR) interface allows the application to access Unified CCE's task and agent management services for different customer contact channel such as email, fax, web collaboration, chat, and voice.

When an application receives a contact request from a customer over a particular channel such as email or chat, the application uses the MR interface to ask Unified CCE for instructions on how to handle this new task. Upon receiving the request, Unified CCE identifies and runs a pre-defined routing script. As a result of the execution of the routing script, Unified CCE tells the application to do one of the following:

1. Execute an application script: The application returns a script execution result to Unified CCE. Unified CCE then continues executing the routing script, possibly utilizing new data collected as a result of running the application script. This step may repeat as directed in the routing script.
2. Offer the task to the specified agent: Route the new task to best available agent – one who has the matching skill within the enterprise – as identified by Unified CCE.

   Alternatively, the routing script may return a label that can be interpreted by the application. The routing script is now considered complete for this task.

In order for Unified CCE to manage the agent activities and properly route tasks, Unified CCE must monitor all the agents that are logged into Unified CCE peripherals such as traditional IPCC/EA peripherals and application instances (multimedia applications). The application instances report the agent's activities and agent status

through the extended Unified CCE CTI/ARM interface. The Agent Reporting and Management (ARM) Interface allows the application to manage agents and report on task activity associated with agents for different customer contact channels. The application can use the Task Event Services (TES) to monitor agent and task events for different customer contact media.

3 System Flow

- Email Routing
- Chat Routing
- Callback Routing Through Unified CCE

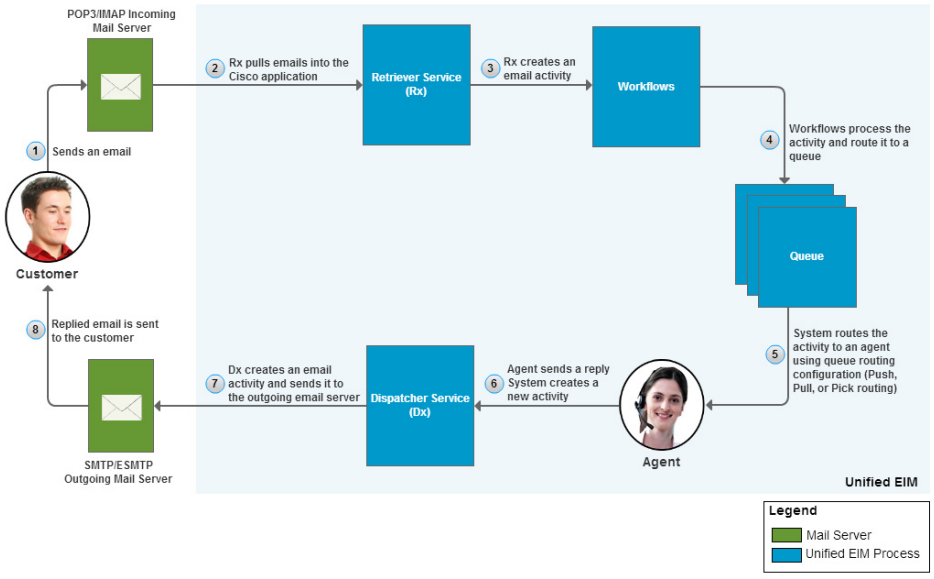
This chapter illustrates the major components involved in the life-cycle of email, chat, and callback, activities as they move through the system. It includes the various steps in the handling of an interaction from the point at which a customer query is received to it being routed to the appropriate user or queue.

Email Routing

There are various steps involved in efficiently responding to emails from customers. Emails are first retrieved into the system and routed to appropriate users or queues. Once a response is created, it is processed through the system and sent to the customer. The general system flow for standalone and integrated email routing is described in this section. It includes:

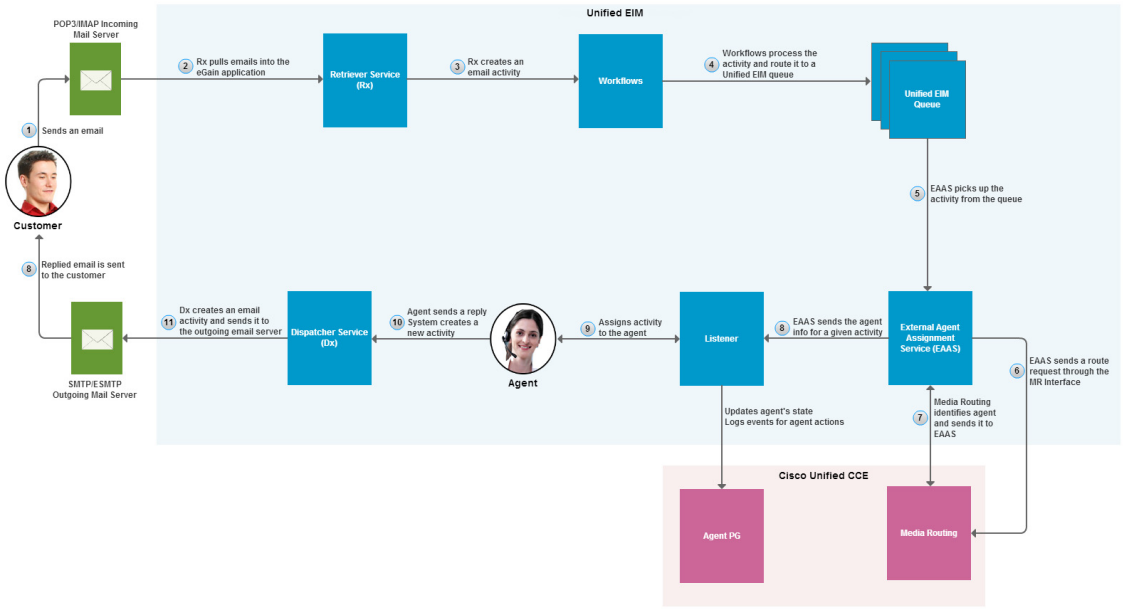
- System Flow for Email Routing Through Cisco Unified EIM
- System Flow for Email Routing Through Unified CCE

System Flow for Email Routing Through Cisco Unified EIM



General system flow for email routing through Cisco Unified EIM

System Flow for Email Routing Through Unified CCE



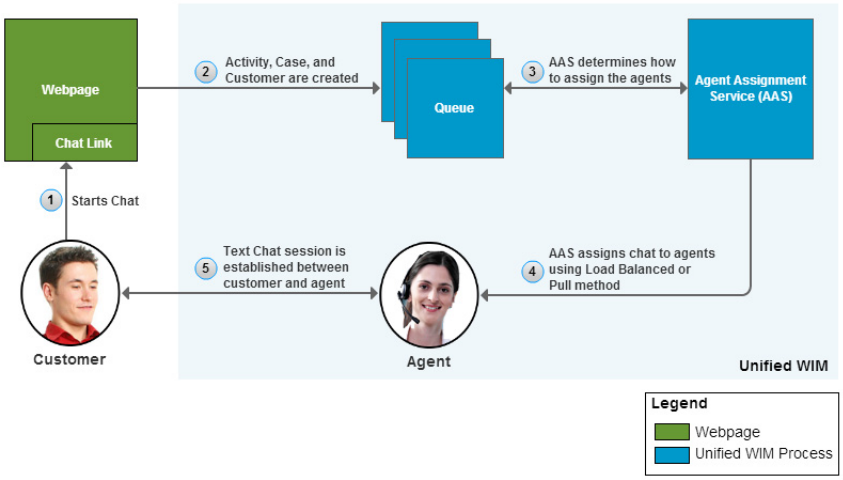
General system flow for email routing through Unified CCE

Chat Routing

There are various steps involved in efficiently responding to chat requests received from customers. The general system flows for handling a chat request in a standalone system and a system integrated with Unified CCE are included.

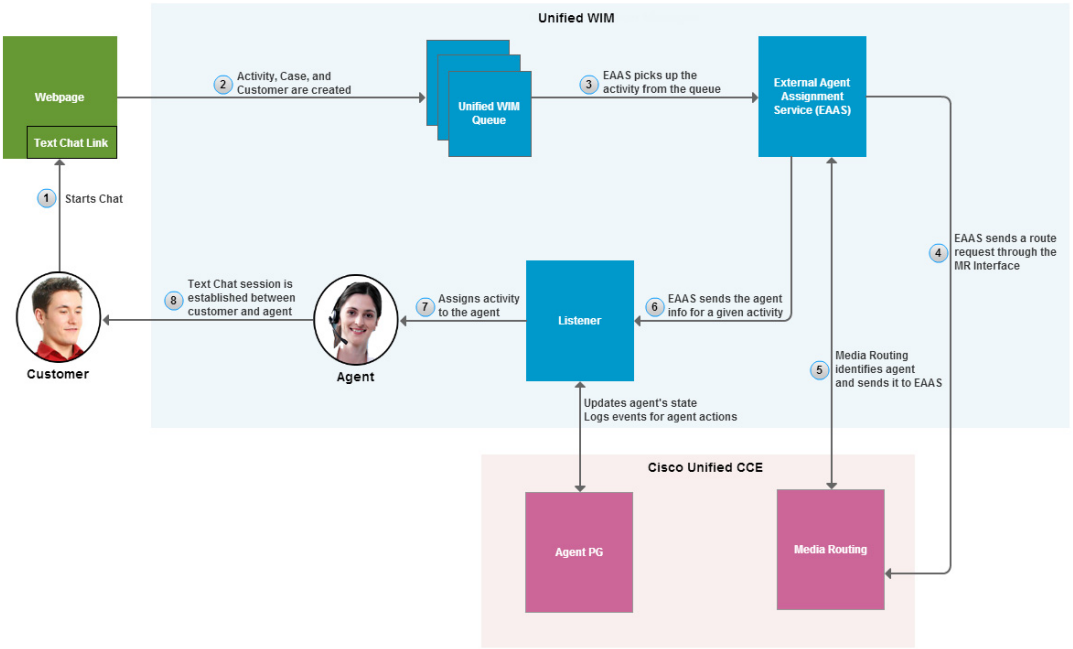
- System Flow for Chat Routing Through Cisco Unified WIM
- System Flow for Chat Routing Through Unified CCE

System Flow for Chat Routing Through Cisco Unified WIM



General system flow for chat routing through Cisco Unified WIM

System Flow for Chat Routing Through Unified CCE

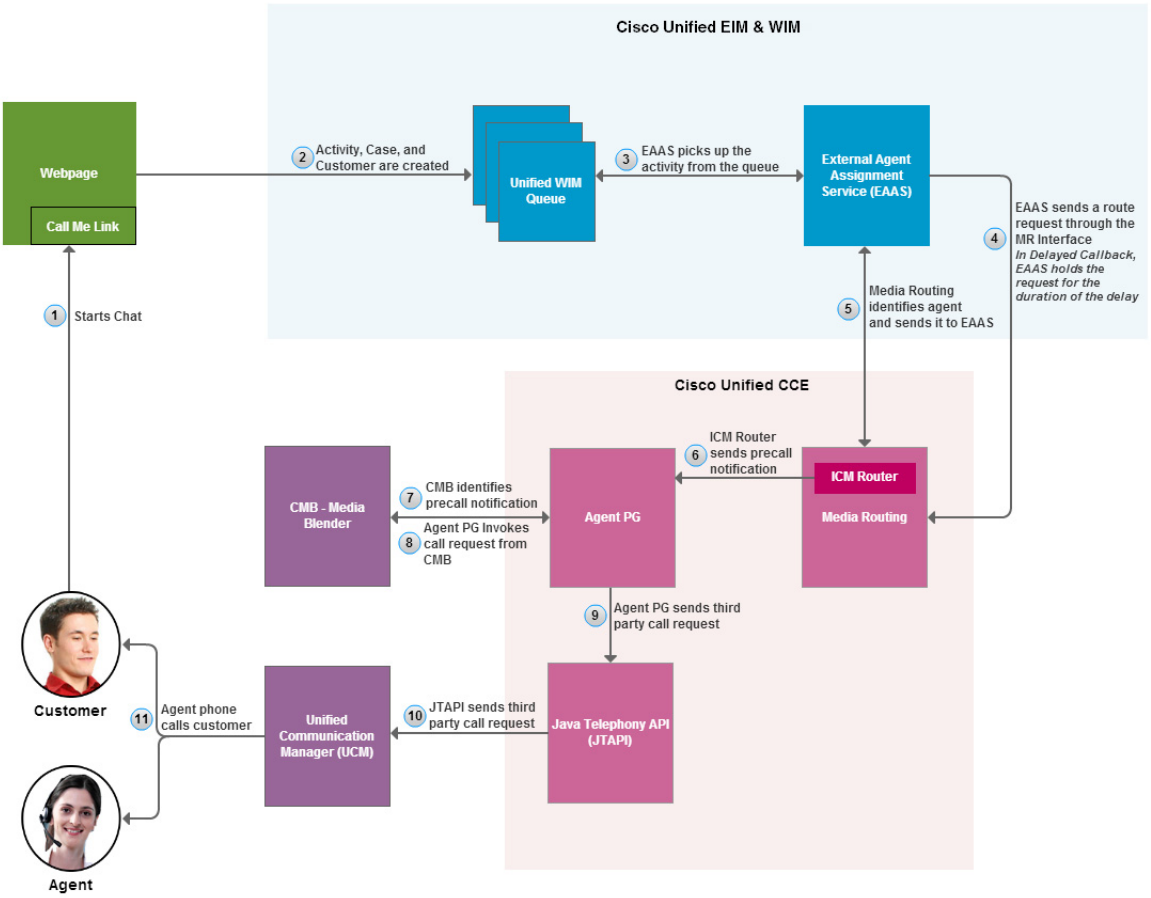


General system flow for chat routing through Unified CCE

Callback Routing Through Unified CCE

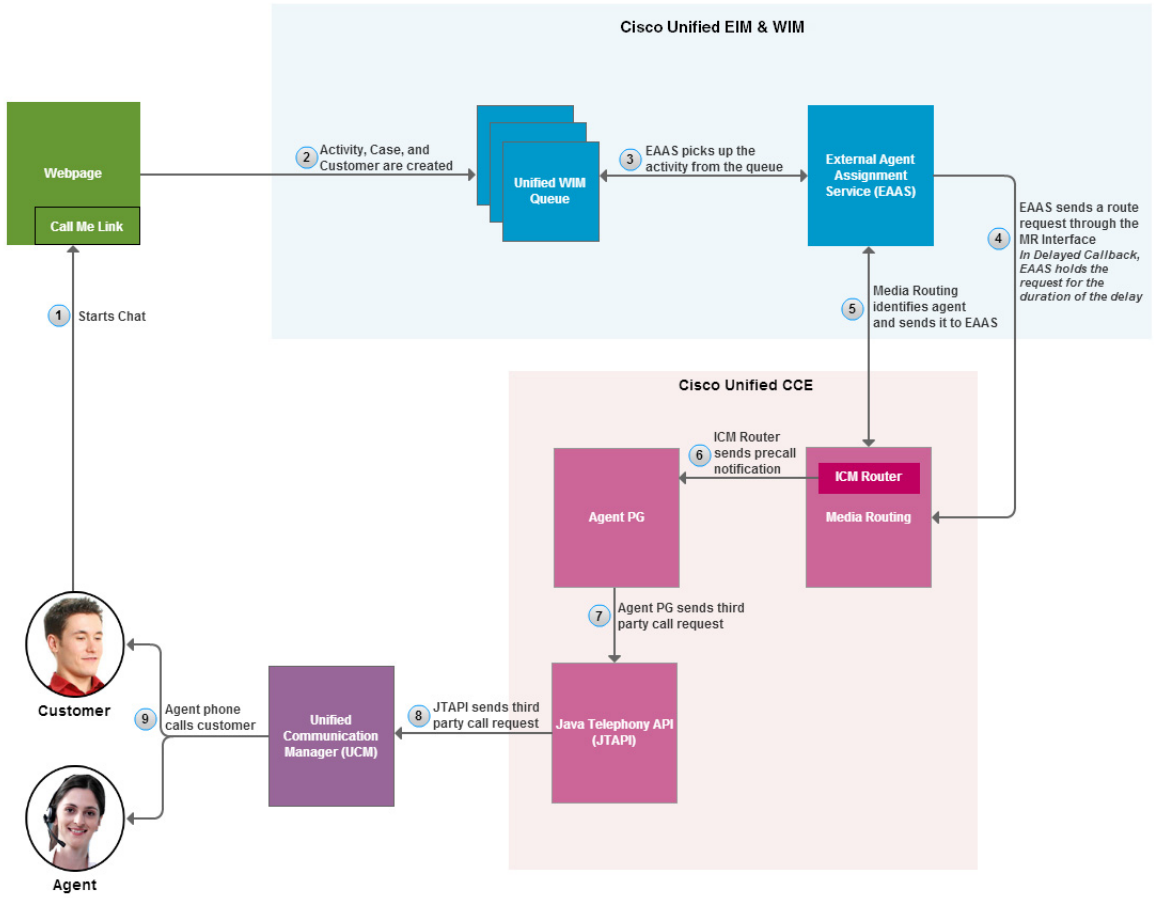
Callback allows customers to submit a phone number using a web form. An agent who can handle the call is identified, and a call is placed, connecting the agent to the customer. The call back can happen right away, or after a period of time chosen by the customer.

The following flow applies if you are using Unified CCE versions 9.0(1) to 9.0(4).



System flow for web and delayed callback through Unified CCE

The following flow applies if you are using Unified CCE versions 10.0(1) or higher.



System flow for web and delayed callback through Unified CCE

4 Sizing Guidelines

- Sizing Inputs
- Planning for Database Growth
- About Deploying on Virtual Servers
- Sizing for Cisco Unified Email Interaction Manager (EIM)
- Sizing for Cisco Unified Web Interaction Manager (WIM)
- Sizing for Combined Email, Web, and Voice Scenarios
- Additional Configurations for Sizing

Sizing Inputs

Configurations presented in the following sections provide sizing for standardized agents who handle up to 12 email messages per hour, or one chat session at a time. If agents are expected to handle more than 12 email messages per hour, on average, or more than one chat session at a time, convert the agent count into a standardized agent count using the following formula:

Email:

```
Standardized agent count for email = Actual agent count * Average Number of
messages handled per hour by each agent / 12
```

Chat:

```
Standardized agent count for chat = Actual agent count * Average number of
concurrent chat sessions handled by each agent
```

Email and Chat:

```
Standardized agent count = Standardized agent count for email + Standardized
agent count for chat
```

Use the standardized agent count to find the appropriate configuration to fit your needs. For sizing for Combined Email, Chat, and Voice Scenarios, see page 42.

Important: **The number of concurrent agents per application server cannot exceed 250, as this is the maximum number of concurrent agents that can be supported for email and chat by one application server in Cisco Unified EIM and WIM.**

Planning for Database Growth

The following factors are considered for calculating the rate of growth of database.

- Incoming and outgoing email volume per month.
- Number of email attachments
- Average size of each email (KB).

The following formula can be used to compute the approximate rate of growth of the database server (MB) per month for activities of type email:

```
((Number of incoming and outgoing emails per month * 2) * (6 + (Average size of
each email message in KB * 2)) / 1024
```

If your system receives emails with attachments, use the following formula and add it to the value for emails.

```
((Number of emails per month with attachments * Average size of attachments
(K))/1024)
```

For example, if average volume of incoming and outgoing emails with attachments is 50,000, and average size of each attachment is 5 KB, monthly rate of growth can be computed as:

```
((50,000 * 5) /1024) = 245 MB per month
```

The following formula can be used to compute the approximate rate of growth of the database server (MB) per month for activities of type chat or callback:

```
((Number of incoming and outgoing chat messages per month) * (6 + (Average size of
each chat message in KB * 3 * 2)) / 1024
```

Important: **These formulas are meant to be used to plan for database growth. Values arrived at using computation may not be an exact match to actual sizes**

Note about archiving:

In deployments that use the Standard edition of Microsoft SQL Server, archive jobs for archiving activities older than a certain number of days must be configured via the Cisco Unified EIM and WIM Administration Console.

The maximum size of the Active database must not exceed 110 GB in order to ensure optimal system performance.

About Deploying on Virtual Servers

All components in the Cisco Unified EIM and WIM deployment must be installed on virtual servers that utilize the OVA templates available on the DocWiki for proper sizing and resource utilization.

For details see http://docwiki.cisco.com/wiki. Locate the page for Unified Communications Virtualization Downloads (including OVA/OVF Templates), and navigate to the section for Cisco Unified Email Interaction Manager and Web Interaction Manager. Note that deployments using the Enterprise edition of SQL Server can expand the size of the database server disk to support growth in data over time.

Since the application leverages the partitioning capabilities of the enterprise editions, data is not archived and purged from the databases. For details about increasing the disk size, see "Expanding the Disk Size on Database Server Machines" on page 51.

For details about implementing a deployment on virtual servers, see http://cisco.com/go/uc-virtualized.

Sizing for Cisco Unified Email Interaction Manager (EIM)

This section includes the following sizing information.

- Support for up to 200 Standardized Concurrent Agents
- Support for 201 to 250 Standardized Concurrent Agents
- Support for 251 to 1250 Standardized Concurrent Agents

Important Information About Sizing

- For a distributed deployment, the concurrent user load must be spread evenly across all the web-application servers in the cluster. Sizing is not affected by the existence of a firewall between the web server and the application server, and by whether the web and application servers are collocated or not.

- In the sizing configurations described here, dual CPU can be replaced by 2 single core CPU, quad CPU can be replaced by 4 single core CPUs, or 2 dual core CPUs, and so on.
- As long as the virtual servers match the CPU, RAM, and hard disk requirements, Cisco Unified EIM and WIM is agnostic to the brand or architecture of physical machines used in the deployment.

Determining Maximum Number of Emails Per Agent Per Hour

- To determine the maximum number of emails per agent per hour for a deployment, use the following calculation

  ```
  Number of emails per agent per hour = (600 * 12) / (Maximum number of
  concurrent email agents)
  ```

  If the result is not a whole number, it must be rounded off to the preceding whole number.

  Here are some examples:

  - If number of concurrent email agents is <= 600

    Each agent can work on up to the following number of emails per hour: (600 * 12) / 600 = 12.
  - If number of concurrent email agents is = 750

    Each agent can work on up to the following number of emails per hour: (600 * 12) / 750 = 9.6 = 9.
  - If number of concurrent email agents is = 1250

    Each agent can work on up to the following number of emails per hour: (600 * 12) / 1250 = 5.76 = 5.

Support for up to 200 Standardized Concurrent Agents

Support for up to 200 concurrent agents, an incoming email rate of 200,000 emails per month, and with each agent handling 12 emails per hour.

In Cisco Unified EIM and WIM, 200 agents working on Unified EIM can be supported on a single-server configuration consisting web, application, file, messaging, services, and database server components.

To deploy this configuration, use the following OVA template:

- UNIFIEDEIM_11.0.1_200_WIN2012_VMV9_V1.0

Support for 201 to 250 Standardized Concurrent Agents

Support for 201 to 250 concurrent agents, an incoming email rate from 200,000 to 700,000 emails per month, and with each agent handling 12 emails per hour.

In Cisco Unified EIM and WIM, up to 250 agents working on Unified EIM can be supported on a distributed server configuration with one web and application server, one file server, one messaging server, one services server, and one database server.

To deploy this configuration, use the following OVA template:

- UNIFIEDEIMWIM_11.0.1_250_WIN2012_VMV9_V1.0

Support for 251 to 1250 Standardized Concurrent Agents

To support this load, a distributed deployment with a configuration consisting of varying number of web-application servers, one file server, one messaging server, one services server, and one database server is required. While the hardware requirements for each component do not change, the number of web-application server pairs required for the deployment changes based on the number of concurrent agents and the rate of incoming emails per month.

In Cisco Unified EIM and WIM, 251 to 1250 agents working on Unified EIM can be supported on a distributed server configuration with a varying number of web and application server pairs. To deploy this configuration, use the following OVA template:

- UNIFIEDEIMWIM_11.0.1_1250_WIN2012_VMV9_V1.0

The following table provides guidance on the number of web-application servers that are required for each increment of 250 standardized concurrent agents.

- To calculate the value of X in the Email per agent per hour column, see Determining Maximum Number of Emails Per Agent Per Hour on page 38.
- The configuration with 1001 to 1250 agents also requires additional workflow processes and instances to be configured in the application. See Configuring Additional Workflow Process and Instances on page 50
- The user load must be evenly distributed across the web-application servers.

Standardized Concurrent Agents	Incoming Email Rate	Emails per Agent per Hour	Number of Web–Application Servers
251 to 500	200,000 to 700,000 emails per month	12	2
501 to 750	1,500,000 emails per month	X	3
751 to 1000	1,500,000 emails per month	X	4
1001 to 1250	2,000,000 emails per month	X	5

Sizing for Cisco Unified Web Interaction Manager (WIM)

This section describes the configuration required to support a production environment for the Unified WIM application in Cisco Unified EIM and WIM.

- Sizing for Concurrent Agent-to-Customer Chat Sessions
- Sizing for Concurrent Web or Delayed Callback Sessions

Important Information About Sizing

- For a distributed deployment, the concurrent chat session load must be spread evenly across all the web-application servers in the cluster.

- In the sizing configurations described here, dual CPU can optionally be replaced by 2 single core CPUs, a quad CPU can optionally be replaced by a 4 single core CPUs, or 2 dual core CPUs, and so on.
- Sizing is not affected by the existence of a firewall between the web server and the application server, and by whether the web and application servers are collocated or not.
- As long as the virtual servers match the CPU, RAM, and hard disk requirements, Cisco Unified EIM and WIM is agnostic to the brand or architecture of physical machines used in the deployment.

Determining Maximum Number of Chats Per Agent Per Hour

- To determine the maximum number of chats per agent per hour for a deployment, use this formula

  ```
  Number of chats per agent per hour = (600 * 12) / (Maximum number of concurrent chat sessions)
  ```

  Here are some examples:

  - If number of concurrent chat sessions is <= 600

    Each agent can work on up to the following number of chats per hour: (600 * 12) / 600 = 12.
  - If number of concurrent chat sessions = 750

    Each agent can work on up to the following number of chats per hour: (600 * 12) / 750 = 9.6 = 9.
  - If number of concurrent chat sessions = 1250

    Each agent can work on up to the following number of chats per hour: (600 * 12) / 1250 = 5.76 = 5.

Sizing for Concurrent Agent-to-Customer Chat Sessions

This section includes information about the following:

- Support for up to 200 Standardized Concurrent Agent-to-Customer Chat Sessions
- Support for 201 to 250 Standardized Concurrent Agent-to-Customer Chat Sessions
- Support for 251 to 1250 Standardized Concurrent Agent-to-Customer Chat Sessions

Support for up to 200 Standardized Concurrent Agent-to-Customer Chat Sessions

In Cisco Unified EIM and WIM, up to 200 concurrent agent-customer chat sessions can be supported on a two server configuration, consisting of one web server, and another server with the file, application, messaging, services, and database components.

To deploy this configuration, use the following OVA template:

- UNIFIEDWIM_11.0.1_200_WIN2012_VMV9_V1.0

Support for 201 to 250 Standardized Concurrent Agent-to-Customer Chat Sessions

In Cisco Unified EIM and WIM, up to 250 concurrent agent-customer chat sessions can be supported on a configuration consisting of one web server, one application server, one file server, one messaging server, one services server, and one database server.

To deploy this configuration, use the following OVA template:

- UNIFIEDEIMWIM_11.0.1_250_WIN2012_VMV9_V1.0

Support for 251 to 1250 Standardized Concurrent Agent-to-Customer Chat Sessions

In Cisco Unified EIM and WIM, up to 1250 concurrent agent-customer chat sessions can be supported on a distributed server configuration. While the hardware requirements for each component do not change, the number of web-application server pairs required for the deployment changes based on the number of concurrent agent-to-customer chat sessions. Load must be evenly distributed across the web-application servers.

To deploy this configuration, use the following OVA template:

- UNIFIEDEIMWIM_11.0.1_1250_WIN2012_VMV9_V1.0

The following table provides guidance on the number of web-application servers that are required for each increment of 250 standardized concurrent agent-to-customer chat sessions. Note that the user load must be evenly distributed across the web-application servers.

Standardized Concurrent Agent-to-Customer Chat Sessions	Number of Web–Application Servers
251 to 500	2
501 to 750	3
751 to 1000	4
1001 to 1250	5

Sizing for Concurrent Web or Delayed Callback Sessions

This section includes the following:

- Support for up to 100 Standardized Concurrent Web or Delayed Callback Sessions
- Support for up to 120 Standardized Concurrent Web or Delayed Callback Sessions
- Support for up to 600 Standardized Concurrent Web or Delayed Callback Sessions

Support for up to 100 Standardized Concurrent Web or Delayed Callback Sessions

In Cisco Unified EIM and WIM, up to 100 concurrent agent-customer web or delayed callback sessions can be supported on a two server configuration, consisting of one web server, and another server with the file, application, messaging, services, and database components.

To deploy this configuration, use the following OVA template:

- UNIFIEDWIM_11.0.1_200_WIN2012_VMV9_V1.0

Support for up to 120 Standardized Concurrent Web or Delayed Callback Sessions

In Cisco Unified EIM and WIM, up to 120 concurrent agent-customer web or delayed callback sessions can be supported on a configuration consisting of one web server, one application server, one file server, one messaging server, one services server, and one database server.

To deploy this configuration, use the following OVA template:

- UNIFIEDEIMWIM_11.0.1_250_WIN2012_VMV9_V1.0

Support for up to 600 Standardized Concurrent Web or Delayed Callback Sessions

In Cisco Unified EIM and WIM, up to 600 concurrent agent-customer web or delayed callback sessions can be supported on a distributed server configuration. While the hardware requirements for each component does not change, the number of web-application server pairs required for the deployment changes based on the number of concurrent agent-to-customer web or delayed callback sessions. Load must be evenly distributed across the web-application servers.

To deploy this configuration, use the following OVA template:

- UNIFIEDEIMWIM_11.0.1_1250_WIN2012_VMV9_V1.0

The following table provides guidance on the number of web-application servers that are required for each increment of 120 standardized concurrent agent-to-customer web or delayed callback sessions. Note that the user load must be evenly distributed across the web-application servers.

Standardized Concurrent Web or Delayed Callback Sessions	Number of Web–Application Servers
121 to 240	2
241 to 360	3
361 to 480	4
481 to 600	5

Sizing for Combined Email, Web, and Voice Scenarios

Cisco Unified EIM and WIM can support multiple media, namely, email chat, and callback. The following combinations of users can be supported on respective configurations described here.

- Support for Concurrent Email and Chat Agents
- Support for Any Combination of Email, Chat, or Callback Sessions

Important Information About Sizing

- For a distributed deployment, the concurrent load must be spread evenly across all the web-application servers in the cluster.
- In the sizing configurations described here, dual CPU can optionally be replaced by 2 single core CPUs and a quad CPU can optionally be replaced by a 4 single core CPUs.
- Sizing is not affected by the existence of a firewall between the web server and the application server, and by whether the web and application servers are collocated or not.

Support for Concurrent Email and Chat Agents

This section includes the following:

- Support for up to 200 Standardized Concurrent Agents
- Support for 201 to 250 Standardized Concurrent Agents
- Support for 251 to 1250 Standardized Concurrent Agents

Support for up to 200 Standardized Concurrent Agents

Support for up to 200 concurrent agents handling email or chat, where each agent can work on emails at the rate of 12 emails per hour, or work on a single active chat session, at the rate of 5 chat sessions per hour. Configuration supports an incoming email rate of up to 120,000 emails per month.

In Cisco Unified EIM and WIM, any combination of agent-customer chat sessions and email agents totaling to 200, can be supported on a two-server configuration consisting of one web server, and another server with the web, application, file, messaging, services, and database components.

To deploy this configuration, use the following OVA template:

- UNIFIEDWIM_11.0.1_200_WIN2012_VMV9_V1.0

Support for 201 to 250 Standardized Concurrent Agents

Support for up to 250 concurrent agents handling email or chat, where each agent can work on emails at the rate of 12 emails per hour, or work on a single active chat session, at the rate of 12 chat sessions per hour. Configuration supports an incoming email rate of 200,000 emails per month.

In Cisco Unified EIM and WIM, any combination of agent-customer chat sessions and email agents totaling to 250, can be supported on a configuration consisting of one web server, one application server, one file server, one messaging server, one services server and one database server.

To deploy this configuration, use the following OVA template:

- UNIFIEDEIMWIM_11.0.1_250_WIN2012_VMV9_V1.0

Support for 251 to 1250 Standardized Concurrent Agents

Support for up to 1250 concurrent agents handling email or chat, where each agent can work on emails at the rate of 12 emails per hour, or work on a single active chat session, at the rate of 12 chat sessions per hour. The largest configuration supports an incoming email rate of 2,000,000 emails per month.

Within the mixed load of 1250, if the concurrent volume of email agents alone exceeds 600, or the concurrent volume of chat sessions alone exceeds 600, determine the maximum number of emails per agent per hour, or maximum number of chats per agent per hour, respectively, for the specific activity type that exceeds 600. For details see "Determining Maximum Number of Emails Per Agent Per Hour" on page 38 and "Determining Maximum Number of Chats Per Agent Per Hour" on page 40.

- In Cisco Unified EIM and WIM, any combination of agent-customer chat sessions and email agents totaling up to 1250 can be supported on a distributed server configuration. While the hardware requirements for each component does not change, the number of web-application server pairs required for the deployment changes based on the number of concurrent agents.
- Load must be evenly distributed across the web-application servers.
- The configuration with 1001 to 1250 agents also requires additional workflow processes and instances to be configured in the application. See Configuring Additional Workflow Process and Instances on page 50.

To deploy this configuration, use the following OVA template:

- UNIFIEDEIMWIM_11.0.1_1250_WIN2012_VMV9_V1.0

The following table provides guidance on the number of web-application servers that are required for each increment of 250 standardized concurrent agents or chat sessions or a combination of the two. Note that the user load must be evenly distributed across the web-application servers.

Standardized Concurrent Agents	Number of Web–Application Servers
251 to 500	2
501 to 750	3
751 to 1000	4
1001 to 1250	5

Support for Any Combination of Email, Chat, or Callback Sessions

Support for any combination of email agents, chat or callback sessions, with the total number of email agents and chat or callback sessions not exceeding 1250. Within the mixed load of 1250, the maximum number of callback sessions supported is 600. If the concurrent volume of email agents alone exceeds 600, or the concurrent volume of chat sessions alone exceeds 600, determine the maximum number of emails per agent per hour, or maximum number of chats per agent per hour, respectively, for the specific activity type that exceeds 600. For details see "Determining Maximum Number of Emails Per Agent Per Hour" on page 38 and "Determining Maximum Number of Chats Per Agent Per Hour" on page 40.

Alternatively, for a mixed concurrent load of 1250, if the number of concurrent callback sessions is 600, a maximum combination of up to 650 concurrent email agents or chat sessions or any combination of both not exceeding 650 may be applied to the deployment.

Thus, any combination of chat or callback sessions and email agents totaling up to 1250 can be supported on a configuration consisting of five web servers, five application servers, one file server, one messaging server, one services server, and one database server. Load must be evenly distributed across the web-application servers.

This configuration also requires additional workflow processes and instances to be configured in the application. See Configuring Additional Workflow Process and Instances on page 50.

To deploy this configuration, use the following OVA template:

- UNIFIEDEIMWIM_11.0.1_1250_WIN2012_VMV9_V1.0

Note: For all the recommended configurations, disk space usage on the database server can be optimized and managed efficiently by configuring archive jobs through the Cisco Unified EIM and WIM application, and setting these to run periodically based on different criteria.

Additional Configurations for Sizing

Changes on the File Server

Updating the JBoss XML Files

On the file server, make changes to the following two JBoss XML files:

Location of files: *Cisco_Home*`\eService\installation\jboss`

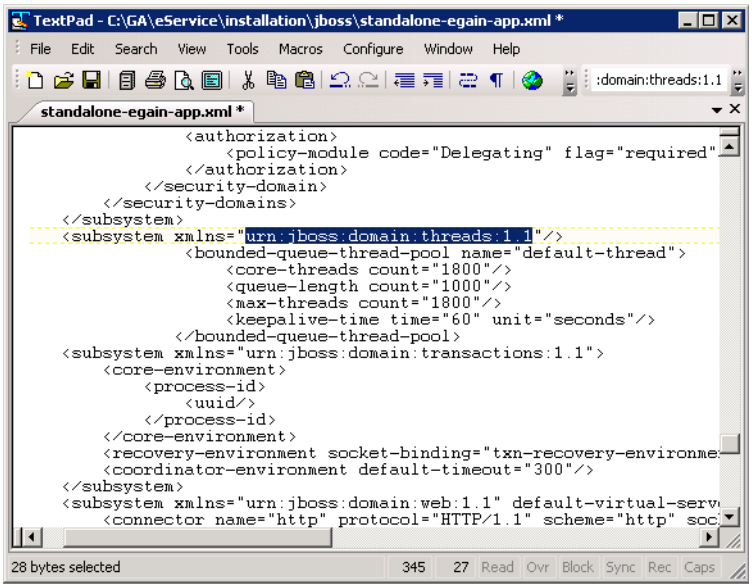
- `standalone-egain.xml`
- `standalone-egain-app.xml`

To update the JBoss XML files:

1. On the file server, browse to *Cisco_Home*`\eService\installation\jboss`.
2. Open the `standalone-egain-app.xml` file in a text editor. and do the following:
   a. In the file, locate "`urn:jboss:domain:threads:1.1`" and under the code line, add the following:

```
<bounded-queue-thread-pool name="default-thread">
<core-threads count="1800"/>
<queue-length count="1000"/>
<max-threads count="1800"/>
<keepalive-time time="60" unit="seconds"/>
```

```
</bounded-queue-thread-pool>
```



Update the standalone-egain-app.xml file

b. In the file locate `connector name="default"` and in the code line add the following parameters after `enabled="true"`

   `executor="default-thread" max-connections="600"`

   The line will look like:

   ```
   <connector name="default" protocol="AJP/1.3" scheme="http" socket-
   binding="default" enabled="true" executor="default-thread" max-
   connections="600"/>
   ```

c. In the file locate `connector name="live"` and in the code line add the following parameters after `enabled="true"`

   `executor="default-thread" max-connections="600"`

   The line will look like:

   ```
   <connector name="live" protocol="AJP/1.3" scheme="http" socket-
   binding="live" enabled="true" executor="default-thread" max-
   connections="600"/>
   ```

d. In the file locate `connector name="pushlet"` and in the code line add the following parameters after `enabled="true"`

   `executor="default-thread" max-connections="600"`

   The line will look like:

   ```
   <connector name="pushlet" protocol="AJP/1.3" scheme="http" socket-
   binding="pushlet" enabled="true" executor="default-thread" max-
   connections="600"/>
   ```

3. Open the `standalone-egain.xml` file in a text editor and make the changes listed in Step 2.

Changes on Web Servers

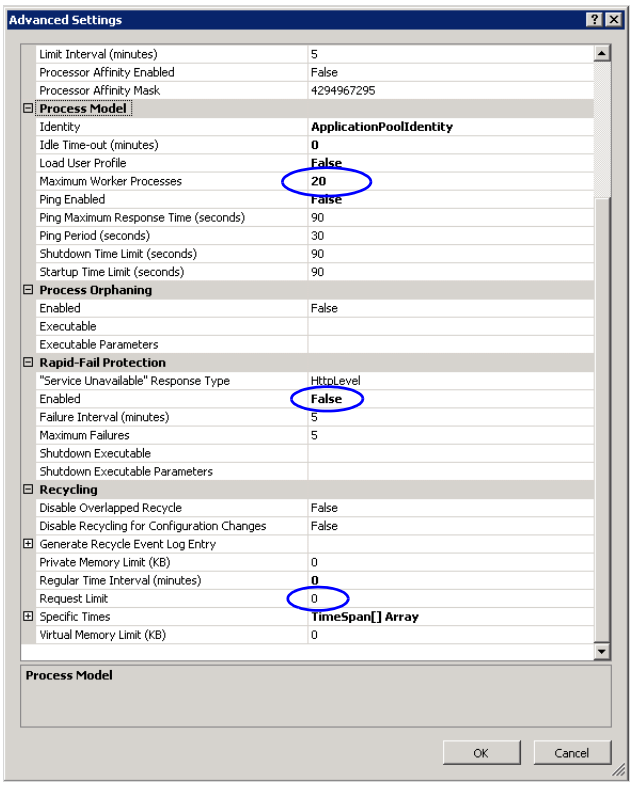
Perform these tasks on all web servers in the deployment.

Updating Default Application Pool Settings

To update the default application pool settings:

1. Go to **Start > Administrative Tools > Internet Information Services (IIS) Manager.**
2. In the Internet Information Services (IIS) Manager window, browse to *Server_Name* **> Application Pools.**
3. In the Application Pools section, Right-click **DefaultAppPool** and from the menu select, **Advanced Settings**.
4. In the Advanced Settings window, set the following:
   a. In the **Process Model** section, set:
      - **Maximum Worker Processes** to **20**
      - **Ping Enabled** set to **False** (default value is False)
   b. In the **Rapid-Fail Protection** section, set:
      - **Enabled** to **False** (default value is False)
   c. In the **Recycling** section, set:
      - **Request Limit** to **0** (default value is 0)

Click **OK** to close the window.

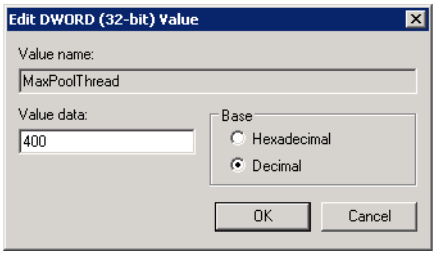


Set the advanced settings

Updating Registry Settings

To update the registry settings:

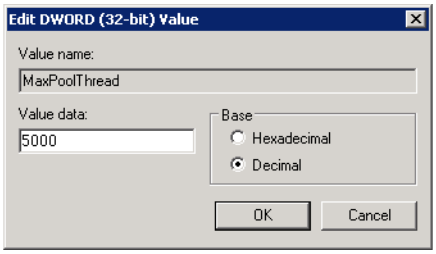
1. Go to Run and type **regedit** to launch the Registry Editor.
2. In the Registry Editor, browse to **HKEY_LOCAL_MACHINE > SYSTEM > CurrentControlSet > services > InetInfo > Parameters.**
3. From the parameters list, right-click **MaxPoolThread** and from the menu select **Modify**.
4. In the Edit DWORD (32-bit) Value window, set the **Value data** to **400.**



Set the value to 400

5. In the Registry Editor, browse to **HKEY_LOCAL_MACHINE > Software > Microsoft > ASP.NET > 2.0.50727.0.**

6. In the list section, right-click and from the Menu select **New > DWORD (32-bit) Value.**
7. Name the new **DWORD** as **MaxConcurrentRequestsPerCPU.**
8. Right-click **MaxConcurrentRequestsPerCPU** and from the menu select **Modify**.
9. In the Edit DWORD (32-bit) Value window, set the **Value data** to **5000.**

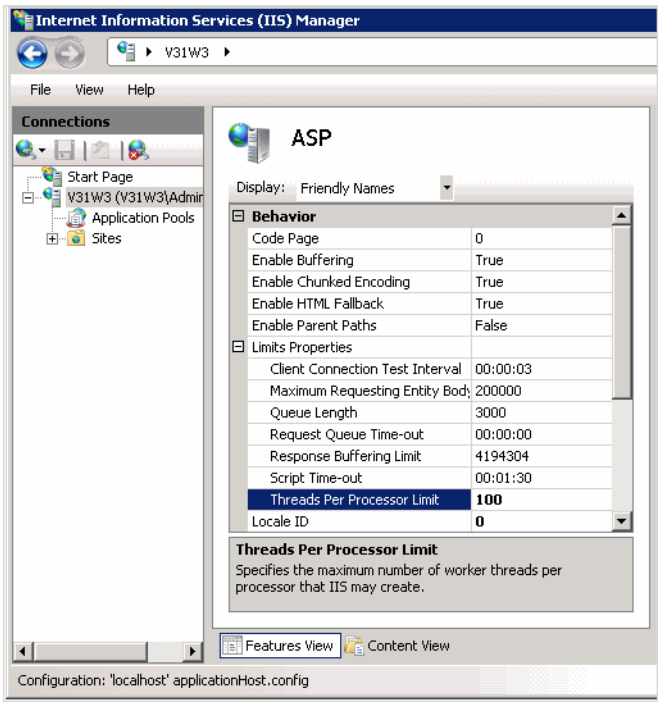


Set the value to 5000

Updating ASP Settings

To update the ASP setting:

1. Go to **Start > Administrative Tools > Internet Information Services (IIS) Manager.**
2. In the Internet Information Services (IIS) Manager window, browse to *Server_Name*.
3. In the IIS section, right-click **ASP** and from the menu select, **Open Features.**
4. In the properties screen that opens, go to the Limit Properties section and for the **Thread Per Processor Limit** setting, set the value to **100**.

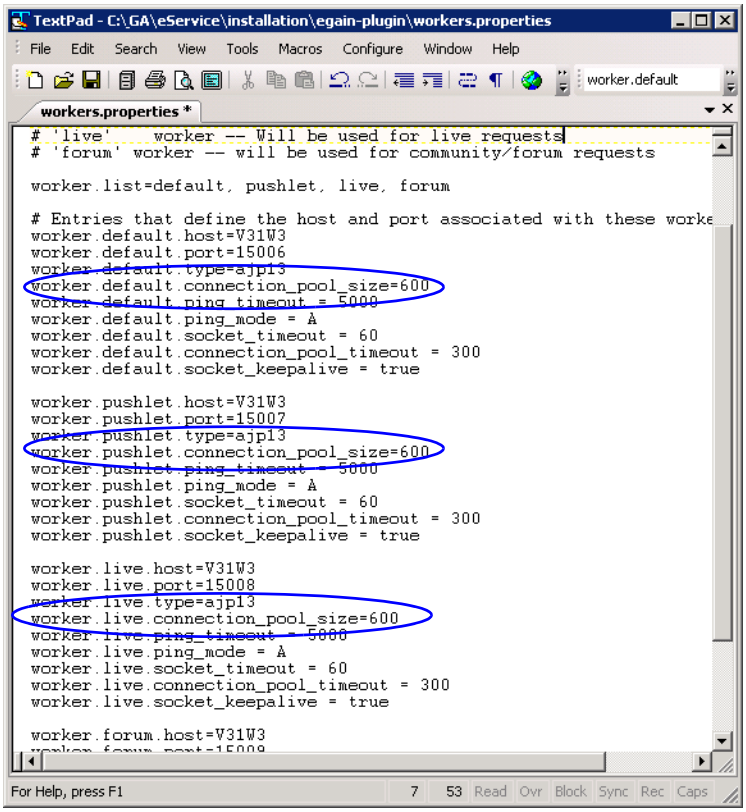


Set the thread per processor limit

Updating the Worker.Properties File

To update the worker.properties file:

1. On the web server, browse to *Cisco_Home*`\eService\installation\egain-plugin.`
2. Open the `worker.properties` file in a text editor and make the following changes:
   a. Locate the `worker.default` section in the file and add the following line to this section:
   `worker.default.connection_pool_size=600`
   b. Locate the `worker.pushlet` section in the file and add the following line to this section:
   `worker.pushlet.connection_pool_size=600`
   c. Locate the `worker.live` section in the file and add the following line to this section:
   `worker.live.connection_pool_size=600`



Configure the worker properties

Configuring Additional Workflow Process and Instances

To support the following loads, two Workflow processes and Instances need to be configured.

- **Email**: Support for 251 to 1250 Standardized Concurrent Agents
- **Combination of Email and Chat**: Support for 251 to 1250 Standardized Concurrent Agents
- **Combination of Email, Chat, and Callback**: Support for Any Combination of Email, Chat, or Callback Sessions

Administrators create the workflow instance from the System Console. For details see the *Cisco Unified Web and E-Mail Interaction Manager Administrator's Guide to System Console.*

Expanding the Disk Size on Database Server Machines

If your deployment uses the enterprise edition of SL Server, over time as the data in your databases grows, you will need to increase the disk space on the database server machines. Follow the instructions provided by VMWare to increase the size of the disk on all the machines on which the data files for the Unified EIM and WIM active, master, and reports databases are installed.

Before you increase the disk space, complete the following tasks

- Stop the Unified EIM and WIM application
- Stop SQL Server

Now expand the disk space on the server where the data size following the VMWare guidelines for your particular operating system. Additional information is available here:
http://kb.vmware.com/selfservice/search.do?cmd=displayKC&docType=kc&docTypeID=DT_KB_1_1&externalId=1004071

After you expand the size, complete the following tasks

- Restart the Windows server
- Log in to the database server where the data files reside and ensure that the disk space has been expanded to the new and increased size
- Restart SQL Server
- Restart the Unified EIM and WIM on all the servers in the deployment

5 Fault Tolerance and Redundancy

- Load Balancing Considerations
- High Availability Options
- Managing Failover

To optimize resource utilization and enhance performance, access to the Cisco Unified EIM and WIM application can be set up for fault tolerance and redundancy. This chapter discusses some considerations for load-balancing and for configuring systems to achieve high-availability and failover.

Load Balancing Considerations

The web service component of a Cisco Unified EIM and WIM deployment can be load-balanced to serve large number of agents accessing the application at the same time. The web (or web-application) servers can be configured behind the load balancer with a virtual IP address, and an agent can access Cisco Unified EIM and WIM through this IP address. Depending on the load balancing algorithm set, the load balancer will send a request to one of the web-application server behind it and send a response back to the agent. This way, from a security perspective, the load balancer serves as a reverse proxy server too.

One of the most essential parameters while configuring a load balancer is to configure it to support sticky sessions with cookie based persistence. After every scheduled maintenance task, before access is opened for users, it is advised to verify that all web-application servers are available to share the load. In absence of this, the first web-application server could be overloaded, due to the sticky connection feature. With other configurable parameters, one can define load balancing algorithms to meet various objectives such as equal load balance, isolation of a web-application server, or sending lesser requests to a low powered web-application servers.

The load balancer monitors the health of all web-application servers in the cluster, and if a problem is observed, the load balancer removes the given web-application server from the available pool of servers, thus preventing new web requests from being directed to the problematic web-application servers.

High Availability Options

Based on typical customer deployment scenarios, the following recommendations apply towards achieving a high-available system deployment.

Aspect	Description	Advantages
Load Balancer	The load balancer is used for distributing web requests across different web servers. Various types of load balancers are available in the industry. Each of these could be configured with different options work distribution, handling failures, or increased activity.	▸ Helps distribute load across different servers. ▸ Helps configure load distribution based on server capacity and current server resources. ▸ Helps handle failures by alternate means of routing a web request.
High-Speed Dedicated LAN	The network is a key ingredient to a successful and highly available application. All Cisco Unified EIM and WIM servers must be located within the same LAN, and not span over other network domains, to ensure good response times.	▸ Stable network connections for distributed components. ▸ Helps serve web requests in a more predictable and reliable manner. ▸ Less delay in responses and thereby increases user experience.
Configuring more than one web-application server	It is highly recommended that more than 1 web-application server be configured. The load balancer detects web server failures and redirects requests to other available web servers, after which, users will have to re-login to Cisco Unified EIM and WIM and a new user session will be created on the target web server.	▸ More than one web-application server helps to load balance web requests to multiple servers based on both system load and availability of servers. ▸ Helps the system scale better to meet growing needs of the enterprise.
Using VMware High Availability options	Deployments can benefit from the features of VMware High Availability (VMHA). For details about virtual server support, see http://cisco.com/go/uc-virtualized For details about VMware High Availability, see the VMHA documentation.	▸ Removes single points of failure from the deployment.

Recommendations for high availability needs

In addition to these recommendations, if a load balancer is configured to monitor the health of web-application servers, it also serves the purpose of high availability.

Managing Failover

Cisco Unified EIM and WIM supports SQL Server clustering for the database server. Some of the key methods of handling failure conditions within a Cisco Unified EIM and WIM and Unified CCE integrated deployment are listed here.

- **Web and Application Servers**: Multiple web-application servers can be deployed in any distributed server deployment. If any of the web-application servers go down, a load balancer can help handle the failure through routing requests to alternate web-application servers. The load balancer detects application server failure and redirects requests to another application server. Users can log into Cisco Unified EIM and WIM without experiencing any significant loss of productivity.

Also note that in deployments without a loadbalancer, if one or more application servers crash, the entire application does not need to be restarted. Only the affected application servers have to be restarted. The rest of the application continues to function normally.

- **Database Server**: Cisco Unified EIM and WIM is certified with the edition of SQL Server that supports clustering. If the database server is enabled with Microsoft SQL Server clustering, a primary and secondary database instance will be managed automatically by the cluster for the given database. In the event of a failure to the primary database instance, the secondary database instance will automatically become active. A replication job must be configured by a DBA to periodically keep the primary and secondary database nodes synchronized with the latest data. If SQL Server clustering is not enabled, and the database server goes down, when the database server comes back up, the Cisco Unified EIM and WIM services automatically reconnect to the database.

  The clustering ability of this edition allows adding additional database failover capabilities to a configuration to boost the availability of SQL Server.

  Note that this capability is different from splitting the different Cisco Unified EIM and WIM databases (active, master, archive, etc.) across different machines. In deployments where each of these databases is installed on a separate machine, clustering can be used on each machine to achieve failover for that particular Cisco Unified EIM and WIM database.

- **File, Services and Messaging Servers**: Cisco Unified EIM and WIM is certified with VMware versions that support VMware High Availability. When VMware HA is configured, automatic failover is managed by VMware.

- **Unified CCE components**: The deployment can allow Cisco Unified EIM and WIM services to failover with duplex Unified CCE components (e.g., MR PIM of MR PG and CTI Server of CTI Gateway) to eliminate downtime of the application in failure circumstances.

6 Network Latency

- Network Latency
- Bandwidth Requirements
- Geographic Server Distribution

Network Latency

Like any web-based application, it is required to setup Cisco Unified EIM and WIM in a high-performance network environment that has sufficient bandwidth with low latency. If the network conditions degrade, it could impact the application performance, which is not desirable. Listed here are some recommendations for network latency Listed here are mandatory guidelines to reduce network latency:

- Servers which are part of Cisco Unified EIM and WIM should be connected on same ethernet switch / VLAN.
- When agents are connecting to access the application remotely, the permissible network latency is 200 milliseconds (one way). Otherwise, higher latency between the agents and the applications servers could lead to slower performance on the agent interface.
- The maximum permissible one-way network delay between the Cisco Unified EIM and WIM servers and the Unified CCE servers is 200 milliseconds.

These points serve well towards ensuring application performance. However, it may be important to note that bandwidth is also related to what the user perceives as good performance. For example, one typical “operation” within the application may take *n* seconds to complete with certain bandwidth, and it may take *n – m* seconds to complete, if the available bandwidth is more. In both cases, application is usable, although one user perceives it to be faster than the other.

Bandwidth Requirements

The minimum required network bandwidth for an agent connecting to the Cisco Unified EIM and WIM servers at login is 384 kilobits/second or higher. After login, at a steady state, an average bandwidth of 40 kilobits/second or higher is required.

An attachment size of up to 50 KB can be accommodated within this required bandwidth. For attachments of size greater than 50 KB, temporary slowness may be experienced in the agent user interface during download of the attachments.

Geographic Server Distribution

Cisco Unified EIM and WIM does not provide support for geographical distribution of Cisco Unified EIM and WIM application components. However, all Unified CCE components such as the Agent PG may be geographically distributed. The network latency each way between the Cisco Unified EIM and WIM servers and the Unified CCE components must be <= 200 milliseconds in order to ensure optimal communication between Cisco Unified EIM and WIM and the geographically distributed Unified CCE components.

7 Firewall and Hardening

- Firewall Considerations
- Server Hardening Considerations

This chapter discusses some of the firewall and hardening considerations that are useful for Cisco Unified EIM and WIM.

Firewall Considerations

- For agents to access Cisco Unified EIM and WIM, either the HTTP or HTTPS (for secured connections) port needs to be opened at the firewall.

  Considerations of applying firewall rules may vary depending on the security policies in effect. If a web server is configured within the firewall with access to the file server ports, Port 139 or 445 to the file server can be blocked from outside the firewall. For details about port configuration, see "Port Number Configuration Between Components" on page 24.

- In a typical installation where agents using Cisco Unified EIM and WIM could be spread across multiple locations, the load balancer, along with the Cisco Unified EIM and WIM web servers, may be deployed in a DMZ. This is a required deployment for Unified WIM installations where customers enter chat sessions from outside the intranet. However, having the web-application servers within the intranet is possible, too. The services and database server can reside in the network over the same or different VLAN.

  If integration of these servers is implemented with Active Directory, then associated ports should be opened for communication with Domain Controllers.

Server Hardening Considerations

Dual strategies could be implemented towards securing the Cisco Unified EIM and WIM application. The first includes implementing standard best practices for physical and software level access controls. These steps could typically be at the corporate level. The other measure is hardening of the server OS and its service components. Please obtain Cisco Security Agent (CSA) with certified security profiles from http://www.cisco.com for all the Cisco Unified EIM and WIM servers to enable intrusion detection and prevention features. For details about the version of CSA that you can use with Cisco Unified EIM and WIM, see the *Hardware and System Software Specification for Cisco Unified Web and E-Mail Interaction Manager.*

Cisco Security Agent

Cisco Security Agent provides threat protection for servers, also known as endpoints. It identifies and prevents malicious behavior, thereby eliminating known and unknown ("day zero") security risks and helping to reduce operational costs. The Cisco Security Agent aggregates and extends multiple endpoint security functions by providing host intrusion prevention, distributed firewall capabilities, malicious mobile code protection, operating system integrity assurance, and audit log consolidation (in managed mode), all within a single product.

Unlike antivirus applications, Cisco Security Agent analyzes behavior rather than relying on signature matching, but both remain critical components to a multi-layered approach to host security. Cisco Security Agent should not be considered a substitute for antivirus applications.

Deploying Cisco Security Agent on Cisco Unified EIM and WIM components involves obtaining a number of application-compatible agents and implementing them according to the desired mode.

For more information on CSA, please go to http://www.cisco.com

Default Windows and IIS Service Requirements for Cisco Unified EIM and WIM

- *In Accessories*, No Document Templates, No Mouse Pointers.
- *In Communications*, No Hyper Terminal.
- *In Application Server*, No Application Server Console, No ASP.NET, No Enable network DTC access, No Message Queuing, IN IIS, No BITS, NO FTP, No FrontPage, No Internet Printing, No NNTP, No, SMTP, In WWW, only WWW Services.
- No Certificate Services
- No Email and Fax Services
- No Indexing Services
- No Networking Services
- No Other Network Files & Print Services
- No Security Configuration Wizard
- No Terminal Server
- No Terminal Server Licensing
- No UDDI
- No Windows Deployment
- No Windows Media Services
- *In Management & Monitoring Tools*, Only SNMP

Guidelines for Microsoft SQL Server

- Restrict windows authentication user to access .mdf and .ldf files and assign read/write access to appropriate users.
- Use NTFS file system as it provides advanced security and recovery features.
- Rename the Windows Administrator account on the SQL Server server to discourage hackers from guessing the administrator password.
- Hide SQL Server service from appearing in the server enumeration box in Query Analyzer, using the /HIDDEN: YES switch of NET CONFIG SERVER command.
- Disable Windows guest user account on production servers.
- Setup roles in SQL Server and configure permissions for windows authentication. Take advantage of the fixed server and database roles by assigning users to the appropriate roles.
- Restrict access to the SQL logs directory.
- Secure registry by restricting access to SQL Server registry keys like *HKEY_LOCAL_MACHINE*`\Software\Microsoft\MSSQLServer`.

- Encrypt User Views, Stored procedure, Functions, and triggers while going live.
- Examine the audit for login failure events and look for trends to detect any possible intrusion.

Hardening the JMX Console and Web Console

- Cisco Unified EIM and WIM has been certified with secure JMX and Web Consoles. For instructions on securing the JMX and Web Consoles on the messaging and all application servers, see https://community.jboss.org/wiki/SecureTheJmxConsole?_sscc=t