Cisco Unified Web and E-mail Interaction Manager Sizing Guide

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Contents

1.0 Introduction

This guide discusses the hardware configurations required to support a production environment for Cisco Interaction Manager. It primarily focuses on the hardware configuration required for the planned number of concurrent users and incoming email volumes.

Cisco Interaction Manager supports various components that may be distributed across various servers in a deployment. The components supported are File Server (includes the Cisco Interaction Manager file system comprising of JSP, JS, HTM, CSS, JAR, CLASS, etc, file extensions), Web Server (includes Microsoft IIS 6.0), Application Server (includes BEA WebLogic Server 8.1 SP5 and JDK 1.4.2.08), Services Server (includes JDK 1.4.2.08 and Cisco Interaction Manager components such as the DSM, Host Manager, RMI Registry, RMID, License Manager, and active processes for all the back-end Cisco Interaction Manager services), and the Database Server (includes Microsoft SQL Server with Cisco Interaction Manager Active, Master, and Archive databases).

The distribution option available with these server components is explained in the next section.

2.0 Configuration Options

As described in the previous section, a Cisco Interaction Manager installation has five components, which are:

1. File Server:
2. Database Server
3. Application Server
4. Web Server
5. Services Server

These components can be installed in three types of configurations

2.1 Collocated Deployment

All components are typically installed on a single server. For chat, the web server can be separated from the application server, and be placed outside the firewall, thus establishing the need for 2 servers.

2.2 Split Deployment

The database server is installed on one server, while all other components are installed on another server. For chat, the web server can be separated from the application server, and be placed outside the firewall, thus establishing the need for 3 servers.

2.3 Distributed Deployment

In a typical distributed server configuration, database server is installed on one server, services server is installed on another server, and application, web and file server components are installed on the third server. For chat, the web server can be separated from the application server, and be placed outside the firewall, thus establishing the need for 4 or more servers in total.

Refer to *Cisco Interaction Manager System Requirements Guide* for more details on hardware and software requirements for each type of configuration described above.

The sizing information in this guide is for single-partition setups only. When sizing for multiple-partition setups, additional hardware will be necessary. For more information on sizing for multiple partitions, please contact Cisco.

3.0 Computing Database and File Server Growth

3.1 Sizing Inputs

Configurations presented in the following sections provide sizing for *Standardized* agents who handle up to 12 email messages per hour. If your agents are expected to handle more than 12 messages per hour, on average, you must convert your agent count into a *Standardized* agent count using the following formula.

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

Use the standardized agent count to find the appropriate configuration to fit your needs.

However, an important point to note is that the number of concurrent agents cannot exceed 120, as this is the **maximum** number of concurrent agents that can be supported by an application server in Cisco Interaction Manager.

3.2 Database growth

Following factors are considered for calculating the rate of growth of database.

1. Incoming and outgoing email volume per month
2. Average size of each email (KB): This excludes the size of attachments since attachments are stored on the file-server, and not in the database.

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

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

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

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

3.3 Location of files for Cisco Interaction Manager

All files related to the Cisco Interaction Manager installation, all log files for Cisco Interaction Manager, and all email attachments will be stored on the Primary Application server.

Having the file server on the primary application server is a best practice, and not a requirement.

3.4 File Server growth

Disk usage on File server is directly proportional to two factors:

1. **Number and size of email attachments with incoming and outgoing emails**

   If the number of incoming and outgoing emails per month and the average size of attachments with each email are known, the growth rate of space occupied by attachments can be computed.

2. **Rate of growth of log files for Cisco Interaction Manager**

   Average growth rate of size of log files with logging level set to SEVERE is 20MB per day. If the logging level is set to FINEST, the growth rate of size of log files is approximately 10 times more than that of SEVERE. At any point, the FINEST level logging must be used for debugging purposes only because if set for an extended period of time, the system performance can be affected from excessive logging.

Combining (1) and (2) provides an estimate of how much the disk space usage will increase per month on the file server. The following formula can be used for computing the monthly growth rate of file server size:

```
((Number of emails per month with attachments * Average size of attachments
(K))/1024) + 20*30
```

E.g., 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 for file server can be computed as:

```
((50,000 * 5) /1024) + 20*30 = 845 MB per month.
```

4.0 Considerations

Following limitations impact the scalability of applications in the Cisco Interaction Manager suite.

4.1 One Services Server

Each installation of Cisco Interaction Manager can have only one services server. All services such as email retriever, email dispatcher, workflows, license manager, session manager, etc, run on the services server.

This also means that services server is a single point of failure. If services server goes down (or needs to be restarted), the entire Cisco Interaction Manager application needs to be restarted through the Cisco Service in Windows Services Panel.

If services server needs to be scaled based on high volumes of emails, it needs to be scaled vertically, i.e. by adding more physical RAM and additional CPUs.

4.2 One Primary Application Server

Each installation of Cisco Interaction Manager can have only one Primary Application server. Based on concurrent agent load, an installation can be scaled by adding more application servers. All the additional application servers are treated as Secondary Application servers.

Difference between Primary and Secondary Application Servers

Apart from serving agent requests (just like secondary application servers), the primary application server also works as the messaging server, i.e., JMS running within the primary application server is used for messaging purposes by all the other secondary application servers and services servers.

Limitation of having a single primary application server in a deployment also implies that this server is also a single point of failure. If this server crashes, or needs to be restarted, the entire Cisco Interaction Manager application needs to be restarted through the Cisco Service in Windows Services Panel.

⚠	**Note** If one or more of the secondary application server(s) crashes, or needs to be restarted, is not required to restart the entire application. Only the secondary application server which crashed needs to be restarted.

In order to reduce the probability of failure of the primary application server, it is required that if agent load increases beyond a certain number, the primary application server must not be used for serving agent requests. Requirements about this have been provided in the subsequent chapters that have details about hardware sizing.

4.3 Cisco Unified Web Interaction Manager (WIM) supported on Primary Application Server

Cisco Interaction Manager has a known limitation in that WIM can work only on the primary application server. Even though one may add secondary application servers to handle additional agent load for Cisco Unified Email Interaction Manager (Unified EIM), WIM cannot be scaled by adding additional secondary application servers.

This limitation also implies that WIM can handle up to 70 concurrent chat sessions between agents and customers and it cannot be scaled beyond this number in Cisco Interaction Manager.

Note

The ability for chat to scale further through the addition of secondary web/application servers will be available as part of a future release. Consequently, the scalability numbers for chat for various configurations that involve multiple secondary web/app servers will also be available at a future time.

4.4 One Database Server

Each installation of Cisco Interaction Manager can point to only one database server.

If needed, the database server has to be scaled vertically by adding more physical RAM, more CPU, and configuring the hard disks on RAID 10 configuration.

Limitation of only a single database server per installation also implies that this server is a single point of failure. If database is stopped or server needs to be restarted, the entire application needs to be restarted as a result of this.

The database server supported is SQL 2000 SP 4.

Note

SQL 2000 clustering has not been certified, and there is no plan to certify and support this at this time by Cisco.

4.5 Port requirements

The following diagram shows the ports that need to be open for accessibility and interactions between servers. The presence of firewall between web and application servers prevents unauthorized access to all the ports between web and application servers, and also between application, file and services servers.

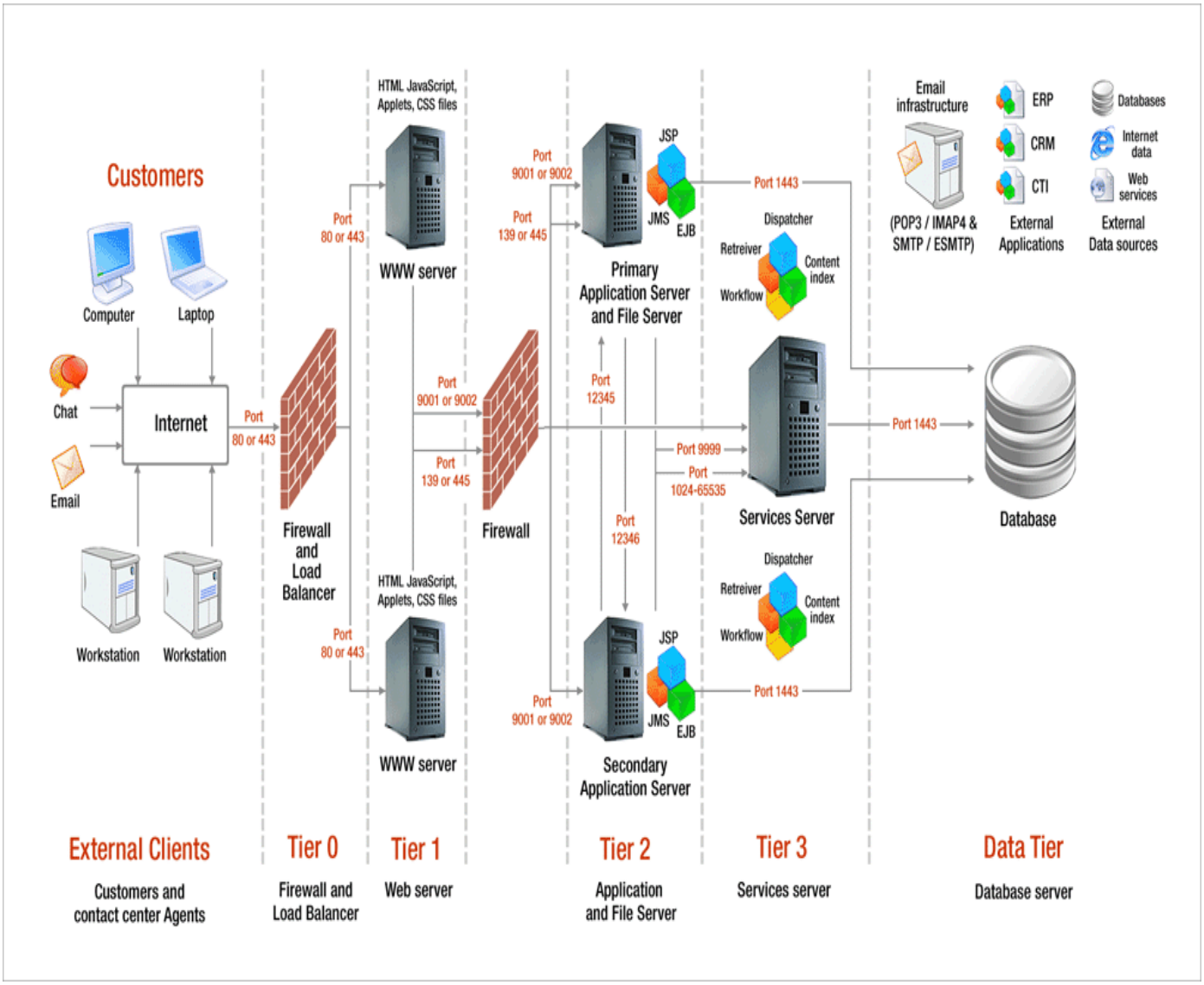


Figure 1: Port Diagram

The following table describes the inbound and outbound ports that need to be opened for the flow of requests.

From Server	To Server	Port(s) Required
Workstation (Internet)	Web Server	80 (for HTTP) 443 (for HTTPS)
Web Server	Application Server	9001 or 9002,

		139 or 445
Application Server	Services Server	9999, 1024 to 65535
Services Server	Database Server	1443
Primary Application Server	Secondary Application Server	12346
Secondary Application Server	Primary Application Server	12345
Primary Application Server	Database Server	1443
Secondary Application Server	Database Server	1443

4.6 Security

Cisco Interaction Manager supports SSL connections to the web server (IIS) through HTTPS, and between the web server and the application server (BEA WebLogic Server). Connectivity encryption supported by Cisco Interaction Manager is limited to the encryption capability available with SSL.

4.7 SQL Licensing

Microsoft SQL Server 2000 (with SP 4) software and corresponding licenses need to be procured independently, and are not shipped with the Cisco Interaction Manager software. The choice of a SQL license model is left entirely to the customer. Please note that the sizing guide does not provide any specific recommendations on the SQL license model that should be used by a customer.

However, the following are commonly used SQL license models.

1) SQL licensing per user (client access licensing model, e.g., 50 users => 50 SQL licenses)
2) SQL licensing per CPU (processor based model; e.g., 2 CPU => 2 SQL licenses)

Please contact a Microsoft-certified reseller for more guidance in this area.

5.0 Sizing for Cisco Unified Email Interaction Manager (EIM)

5.1 Support for up to 50 concurrent agents, an incoming email rate of 35,000 emails per month, and with each agent handling 12 emails per hour.

In Cisco Interaction Manager, 50 agents working on EIM can be supported on a single-server configuration consisting of application, web, services and database server with the following configuration.

Item	Web, Application, Services and Database Server
CPU	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2
RAM	4 GB
Hard Disk	2 x 73 GB Ultra3 SCSI RAID 1
Equivalent MCS Configuration	7845

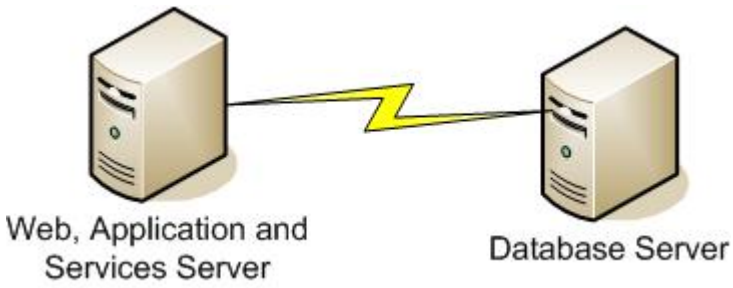
Note

If incoming email volume is more that 35,000 emails per month, the configuration specified for 50 to 70 users will be required.

5.2 Support for 50 to 70 concurrent agents, an incoming email rate from 35,000 to 200,000 per month, and with each agent handling 12 emails per hour.

In Cisco Interaction Manager, up to 70 agents working on EIM can be supported on a split-server configuration consisting of application, web, services, and database server with the following configuration.

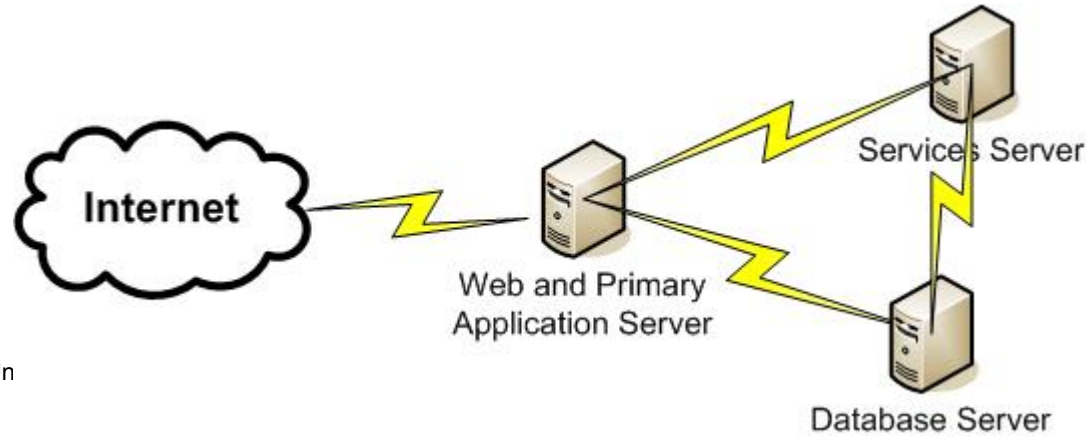
Item	Web, Application and Services Server	Database Server
CPU	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed) Quantity: 2
RAM	4 GB	4 GB
Hard Disk	2 x 73 GB Ultra3 SCSI RAID 1	▸ 2 x 73GB RAID 1 – configured as OS and separate logical volume for page file ▸ 4 x 73GB RAID 10 – configured for data files, database log files and full text catalogues.
Equivalent MCS Configuration	7845	7845



5.3 Support for 50 to 70 concurrent agents, an incoming email rate from 200,000 to 500,000 emails per month, and with each agent handling 12 emails per hour.

In Cisco Interaction Manager, up to 70 agents working on EIM can be supported on a split-server configuration consisting of application, web, services, and database server with the following configuration.

Item	Web and Application Server	Services Server	Database Server
CPU	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed) Quantity: 2
RAM	2 GB	4 GB	4 GB
Hard Disk	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1	▸ 2 x 73GB RAID 1 – configured as OS and separate logical volume for page file ▸ 4 x 73GB RAID 10 – configured for data files, database log files and full text catalogues.
Equivalent MCS Configuration	7835 or 7845	7845	7845



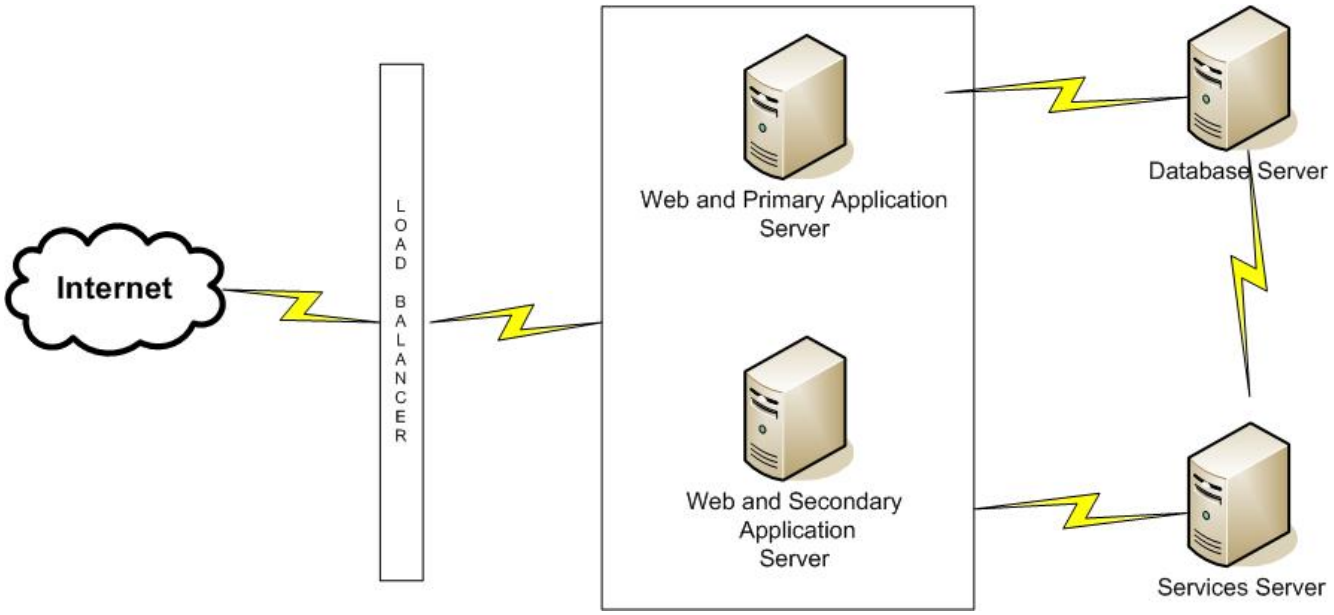
5.4 Support for 70 to 160 concurrent agents, an incoming email rate of 500,000 to 700,000 emails per month, and with each agent handling 12 emails per hour.

In Cisco Interaction Manager, up to 160 agents working on EIM can be supported on a four-server configuration, consisting of two web/application servers, one services server, and one database server with the following configuration.

> **Note**
>
> For any load of more than 120 concurrent users, Primary web/application server must not be used for serving agent requests and it must be taken out of load balancer.

Item	Web and Application Servers (2)	Services Server	Database Server (Requires Windows 2003 Enterprise and MSSQL 2000 Enterprise version)
CPU	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed) Quantity: 2
RAM	2 GB	4 GB	4 GB
Hard Disk	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1	Minimum Recommendation: ▸ 2 x 73GB RAID 1 – configured as OS and separate logical volume for page file ▸ 4 x 73GB RAID 10 – configured for data files, database log files and full text catalogues. Optimal Recommendation: ▸ 2 x 73GB RAID 1 – configured as OS and separate logical volume for page file

			▸ 12 x 73GB RAID 10 – split into 2 array-sets; one configured for data files and other for database log files and full text catalogues
Equivalent MCS Configuration	7835 or 7845	7845	7845

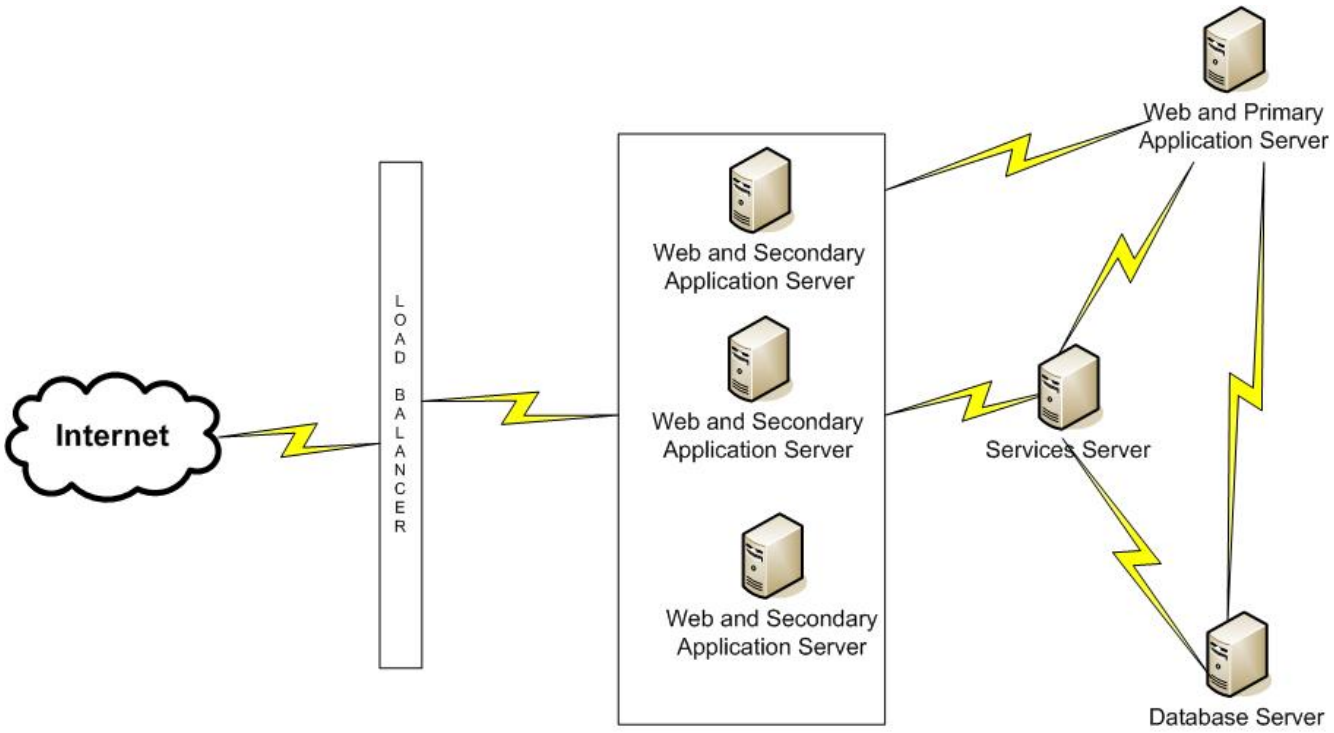


5.5 Support for 160 to 240 concurrent agents, an incoming email rate of 500,000 to 700,000 emails per month, and with each agent handling 12 emails per hour.

In Cisco Interaction Manager, up to 240 agents working on EIM can be supported on a six -server configuration consisting of 3 secondary web/application servers, one primary web/application server, one services server, and one database server with the following configuration.

> ⚠ **Note**
>
> For any load of more than 120 concurrent users, Primary web/application server must not be used for serving agent requests and it must be taken out of load balancer.

Item	**Web and Application Servers (4)**	**Services Server**	**Database Server (Requires Windows 2003 Enterprise and MSSQL 2000 Enterprise version)**
CPU	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed) Quantity: 4
RAM	2 GB	4 GB	8 GB
Hard Disk	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1	▸ 2 x 73GB RAID 1 – configured as OS and separate logical volume for page file ▸ 12 x 73GB RAID 10 – split into 2 array-sets; one configured for data files and other for database log files and full text catalogues
Equivalent MCS Configuration	7835 or 7845	7845	N/A

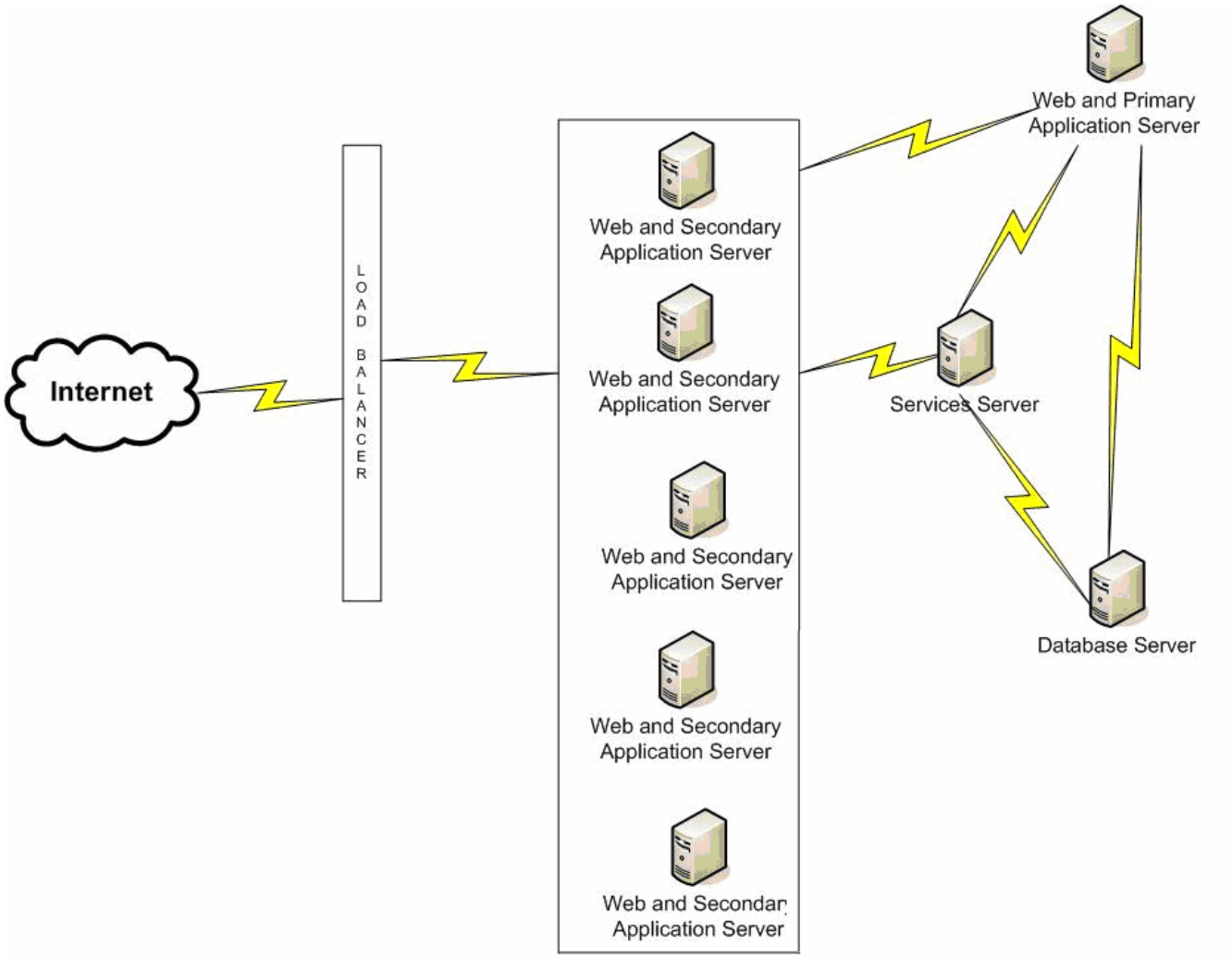

Internet
LOAD BALANCER
Web and Secondary Application Server
Web and Secondary Application Server
Web and Secondary Application Server
Web and Primary Application Server
Services Server
Database Server

5.6 Support for up to 400 concurrent agents, an incoming email rate of 700,000 emails per month, and with each agent handling 12 emails per hour.

In Cisco Interaction Manager, up to 400 agents working on EIM can be supported on an eight-server configuration consisting of 5 secondary web/application servers, one primary web/application server, one services server, and one database server with the following configuration.

> **Note**
>
> For any load of more than 120 concurrent users, Primary web/application server must not be used for serving agent requests and it must be taken out of load balancer.

Item	**Web and Application Servers (6)**	**Services Server**	**Database Server (Requires Windows 2003 Enterprise and MSSQL 2000 Enterprise version)**
CPU	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed) Quantity: 8
RAM	2 GB	4 GB	16 GB
Hard Disk	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1	▸ 2 x 73GB RAID 1 – configured as OS and separate logical volume for page file ▸ 12 x 73GB RAID 10 – split into 2 array-sets; one configured for data files and other for database log files and full text catalogues
Equivalent MCS Configuration	7835 or 7845	7845	N/A


Internet
LOAD BALANCER
Web and Secondary Application Server
Web and Secondary Application Server
Web and Secondary Application Server
Web and Secondary Application Server
Web and Secondar Application Server
Web and Primary Application Server
Services Server
Database Server

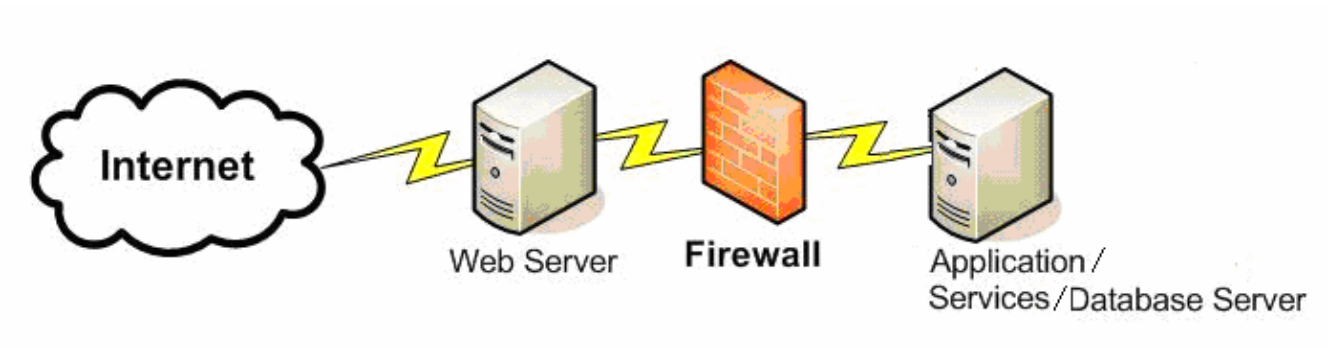
6.0 Sizing for Cisco Unified Web Interaction Manager (WIM)

This section describes the configuration required to support a production environment for the WIM application in Cisco Interaction Manager.

Due to a known limitation, WIM can run only on the primary application server, and therefore can support up to 70 concurrent agent-to-customer chat sessions. It cannot be scaled further by adding additional secondary application servers.

6.1 Support for up to 30 concurrent agent-to-customer chat sessions

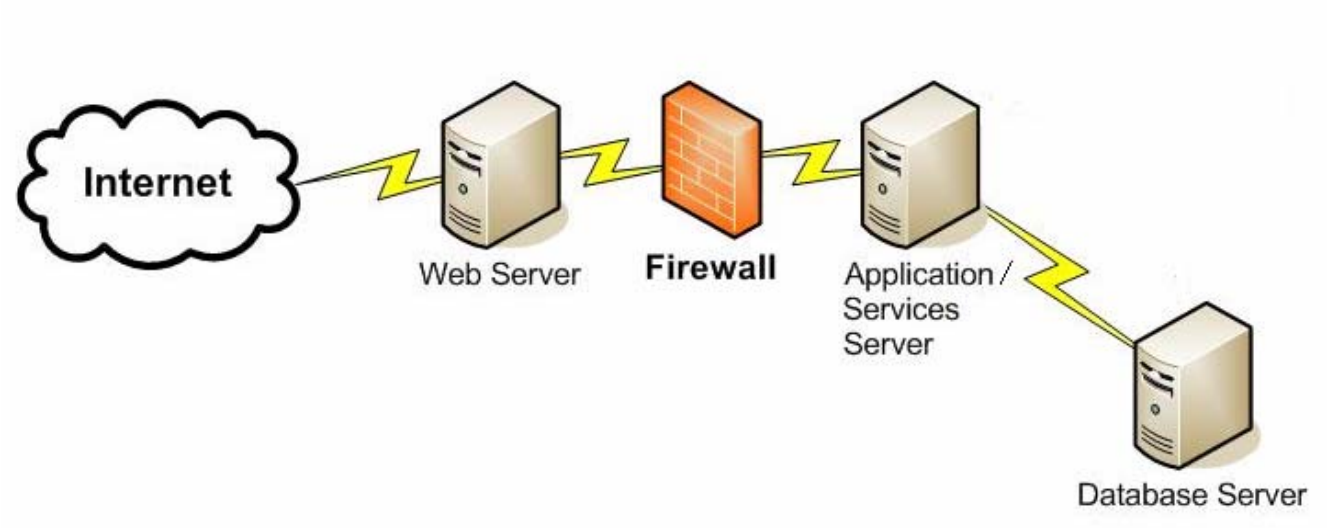
Item	Web Server	Application, Services, and Database Server
CPU	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 1	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2
RAM	2 GB	4 GB
Hard Disk	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1
Equivalent MCS Configuration	7825 or 7835	7845



6.2 Support for up to 70 concurrent agent-to-customer chat sessions.

Item	Web Server	Application and Services Server	Database Server
CPU	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 1	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed) Quantity: 2

RAM	2 GB	2 GB	4 GB
Hard Disk	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1	▸ 2 x 73GB RAID 1 – configured as OS and separate logical volume for page file ▸ 4 x 73GB RAID 10 – configured for data files, database log files and full text catalogues.
Equivalent MCS Configuration	7825 or 7835	7845	7845


Internet
Web Server
Firewall
Application /
Services
Server
Database Server

7.0 Sizing for Combined Email and Web Scenarios

Cisco Interaction Manager can support multiple media, namely, email and chat. The following combinations of users can be supported on respective configurations described below.

For the below configurations, if additional EIM agents (more than 70) are required, please use the sizing guidelines outlined for EIM in previous sections , adding a web server and app server (Dual CPU Intel Xeon 3 GHz or higher, 2 GB RAM, and 2 x 73 GB Ultra3 SCSI RAID 1 hard disk) for the chat users.

⚠	**Note** If the sizing is for a combination that is different from the ones mentioned in this guide, please contact Cisco.

7.1 Support for up to 50 concurrent agents with any combination of EIM and WIM usage, an incoming email rate of up to 35,000 per month, and with each EIM agent handling 12 emails per hour.

Item	Web Server	Application, Services and Database Server
CPU	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled). Quantity: 1	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2
RAM	2 GB	4 GB
Hard Disk	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1
Equivalent MCS Configuration	7825 or 7835	7845

7.2 Support for up to 30 concurrent agents for EIM and up to 30 concurrent chat sessions for WIM (60 agents in total, with 30 one-to-one collaborative chat sessions), an incoming email rate of up to 35,000 emails per month, and with each EIM agent handling 12 emails per hour.

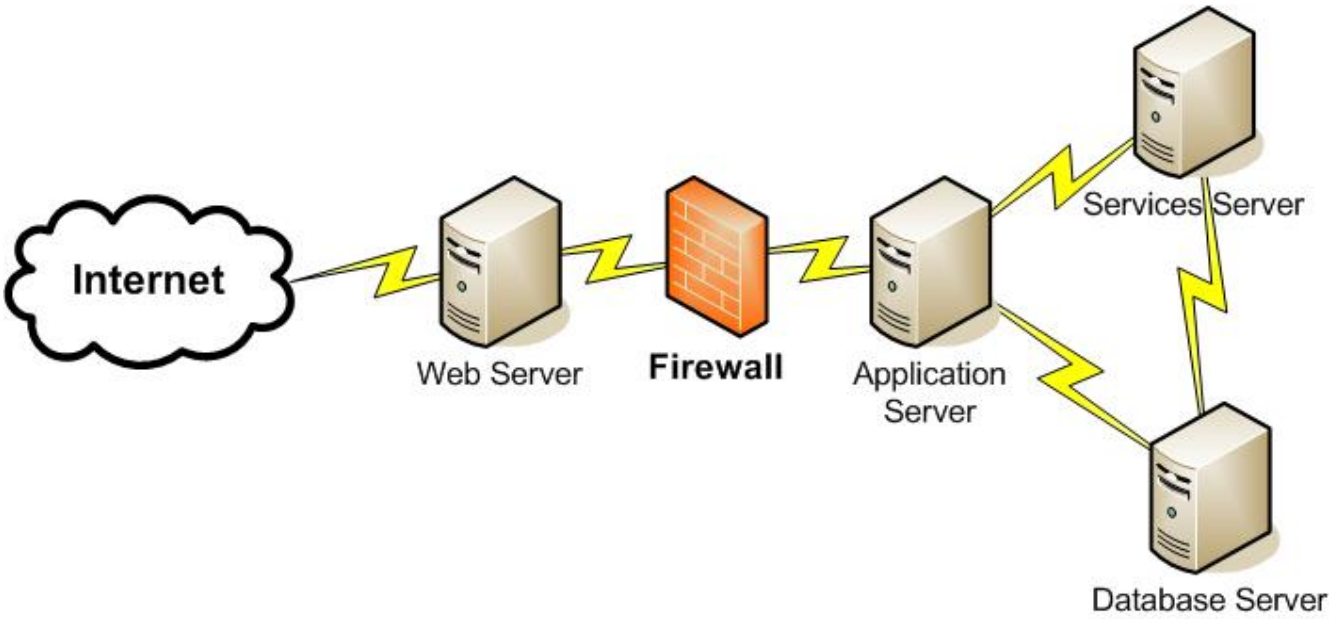
Item	Web Server	Application and Services Server	Database Server
CPU	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled). Quantity: 1	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2

RAM	2 GB	2 GB	4 GB
Hard Disk	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1
Equivalent MCS Configuration	7825 or 7835	7845	7845

7.3 Support for up to 70 concurrent agents with any combination of EIM and WIM usage, an incoming email rate of up to 200,000 emails per month, and with each EIM agent handling 12 emails per hour.

Item	**Web Server**	**Application Server**	**Services Server**	**Database Server (Requires Windows 2003 Enterprise and MSSQL 2000 Enterprise version)**
CPU	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 1	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed) Quantity: 2
RAM	2 GB	2 GB	4 GB	4 GB
Hard Disk	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1	▸ 2 x 73GB RAID 1 – configured as OS and separate logical volume for page file ▸ 4 x 73GB RAID 10 –

				configured for data files, database log files and full text catalogues.
Equivalent MCS Configuration	7825 or 7835	7835 or 7845	7845	7845



7.4 Support for up to 70 concurrent agents for EIM and up to 70 concurrent chat sessions for WIM (140 agents in total, with 70 one-to-one collaborative chat sessions), an incoming email rate of up to 200,000 emails per month, and with each EIM agent handling 12 emails per hour.

This scenario can support the following number of users for each application:

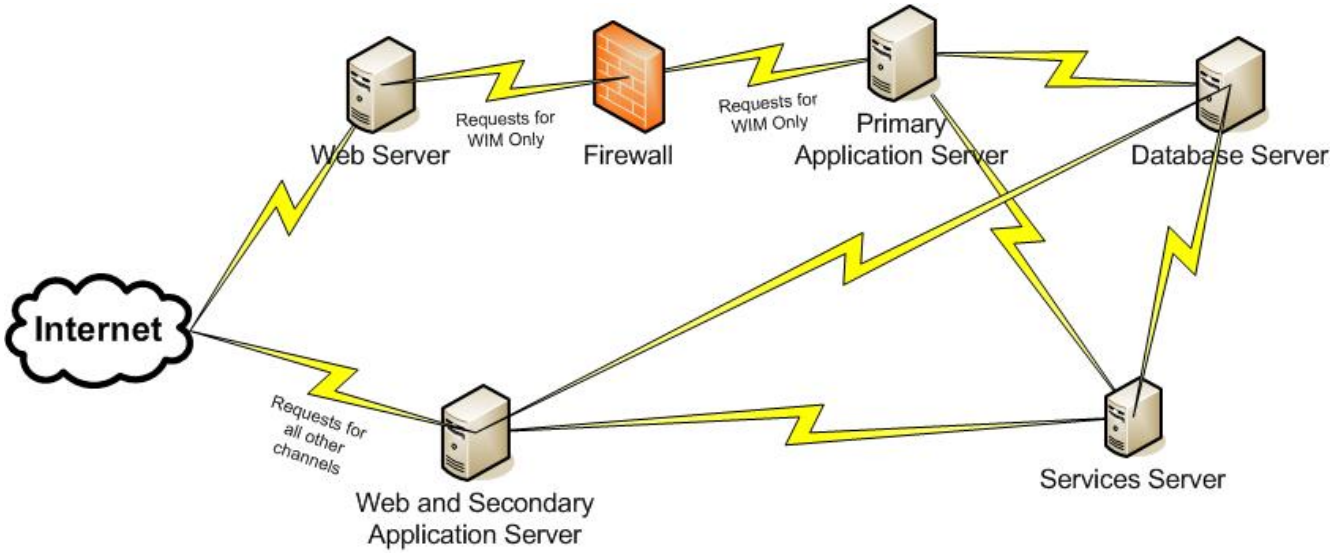
1. Maximum of 70 concurrent WIM agents (70 concurrent agent-customer chat sessions)

> **Note**
>
> Because of a known limitation in Cisco Interaction Manager, all WIM agents have to be supported on the primary application server only.

2. Up to 70 concurrent EIM agents.

Item	**Web Server**	**Application Server**	**Services Server**	**Database Server (Requires Windows 2003 Enterprise and MSSQL 2000 Enterprise version)**
CPU	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 1	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed, with hyper-threading enabled) Quantity: 2	Intel Xeon (3 GHz or higher speed) Quantity: 4
RAM	2 GB	2 GB	4 GB	4 GB
Hard Disk	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1	2 x 73 GB Ultra3 SCSI RAID 1	▸ 2 x 73GB RAID 1 – configured as OS and separate logical volume for page file ▸ 12 x 73GB RAID 10 – split

				into 2 array-sets; one of them configured for data files and other for database log files and full text catalogues.
Equivalent MCS Configuration	7825 or 7835	7835 or 7845	7845	N/A



Note

For all the recommended configurations above, disk space usage on the database server can be minimized and managed efficiently by configuring archive jobs through the Cisco Interaction Manager application, and setting these to run periodically based on different criteria.