



ICM Platform Planning

After you have the system sizing considerations, you can begin to order the appropriate server configuration. First, however, determine how many Unified ICM nodes you need.

The number of servers required in a Unified ICM system depends on the configuration of the central controller, PGs, NICs, and other nodes. For example, a duplexed central controller configuration requires more servers because the CallRouter and Logger are duplicated.



Note All contact center enterprise solutions must now run on virtual machines, they are no longer supported on bare hardware. For hardware requirements for Unified CCE virtualized systems, see the *Solution Design Guide for Cisco Unified Contact Center Enterprise* at http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_implementation_design_guides_list.html and *Virtualization for Unified Contact Center Enterprise* at http://www.cisco.com/c/dam/en/us/td/docs/voice_ip_comm/uc_system/virtualization/virtualization-unified-contact-center-enterprise.html.

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Number of Servers Required

The following table shows how to determine the number of servers required in your system.

The counts of servers in this example are based on an Unified ICM configuration that has the following characteristics:

- The Unified ICM system has a duplexed, geographically distributed central controller (in other words, each central site has a CallRouter and a Logger).
- One side of the central controller (Central Site 1) is located at a call center and consequently has a PG to serve one or more ACDs. The PG is duplexed (two servers) for fault tolerance.
- This Unified ICM installation has three remote call center sites and two Admin sites.

Table 1: Sample Server Requirements

Sites	Node Types					
	CallRtr	Lgr	Call/Lgr	DB Server	PG	Administration & Data Server with HDS
Central Site 1	1	1	-	-	2	1
Central Site 2	1	1	-	-	-	1
Remote Call Center 1	-----	-----	-----	-----	2	-
Remote Call Center 2	-----	-----	-----	-----	2	-
Remote Call Center 3	-----	-----	-----	-----	2	-
Admin Site 1	-----	-----	-----	-----	-----	1
Admin Site 2	-----	-----	-----	-----	-----	1
Total Nodes:	2	2			8	4
Key:	----- These servers are not installed at this type of site. - Not selected as an option in this particular configuration.					

ICM Platform Considerations

For information on server configurations and examples of supported server platforms, see *Contact Center Enterprise Compatibility Matrix* at <https://www.cisco.com/c/en/us/support/customer-collaboration/unified-contact-center-enterprise/products-device-support-tables-list.html>.

Processor Utilization



Note Required only in ICM Gateway SQL configurations.

As a general rule for all Unified ICM nodes, keep processor utilization below 60 percent of the maximum expected call load on the system. This is needed to smooth out call request “spikes” as well as to allow enough reserve capacity to perform activities such as re-synchronization and background cleanup. Non-ICM software can make up a part of the 60 percent maximum load. The processor utilization figure (60 percent) covers all software running on the platform.

In addition to the utilization requirement, no software on the system can run at a priority equal to or higher than the Unified ICM software for more than 100 milliseconds in uninterrupted bursts. In other words, the Unified ICM software needs to run on the system at least as frequently as once every 100 milliseconds. This

is usually not a problem unless device drivers or other kernel-level software is installed, or process/thread priorities have changed incorrectly.

Paging Requirements

The most time-critical component of the Unified ICM system, the CallRouter node, must not be delayed due to disk I/O (that is, paging). The only disk I/O that should be occurring on Unified ICM machines is for log file writes and database I/O. The database I/Os occur on Logger and Administration & Data Server machines. The simple rule is to provide enough main memory so that the entire working sets of critical processes remain in memory.

For complete and current information about RAM and other platform requirements, see the Virtualization information https://www.cisco.com/c/dam/en/us/td/docs/voice_ip_comm/uc_system/virtualization/virtualization-unified-contact-center-enterprise.html.

Make sure the database platforms (Loggers, Administration & Data Servers, and Unified ICM Gateway SQL machines) have enough main memory so that all first level index pages are kept in main memory cache.

Logger Expansion

The Logger platform you order can include a combination of internal and external SCSI hard drives. As your call center enterprise grows, your database requirements typically grow as well. You may have more services, skill groups, and routes in your configuration, and you may route more calls each day. This database growth means more historical data stored in the central database.

When your database requirements change, contact your Unified ICM software support provider to have the storage capacity of the central database increased.



Note For information about data storage in virtualized deployments, see Virtualization for Unified Contact Center Enterprise at http://www.cisco.com/c/dam/en/us/td/docs/voice_ip_comm/uc_system/virtualization/virtualization-unified-contact-center-enterprise.html.

You can allocate more database space after you install your system by:

- Remotely adding database space (if current disk space allows).
- Installing “hot-plugable” disk drives and configuring the disks while the system is running.

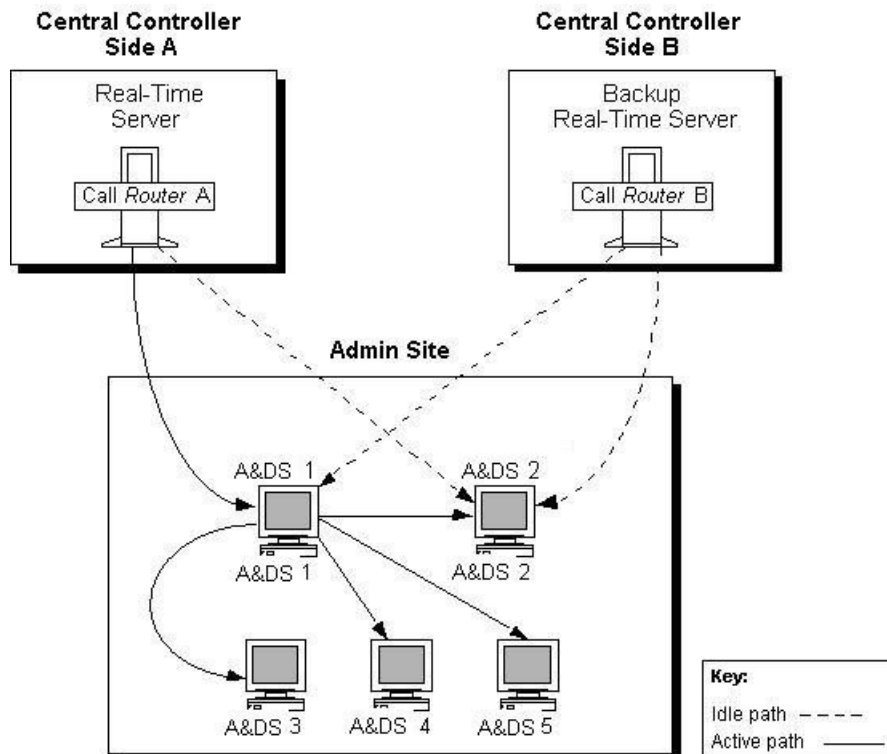


Note After you install the Unified ICM system, see *Administration Guide for Cisco Unified ICM Enterprise* for information on how to manage database space.

Administration and Data Server Planning

To allow users to monitor current call center activity, the Unified ICM system forwards real-time data to Administration & Data Servers at selected sites throughout the call center enterprise. The following figure illustrates the real-time architecture of the Unified ICM system.

Figure 1: Real-Time Architecture of the Unified ICM System



Real-time call and agent group status data arrives at the central controller from the Peripheral Gateways, which are constantly monitoring activity at each call center. The CallRouter acts as the real-time server. The CallRouter for the other side of the central controller acts as a back-up real-time server.

The CallRouter is responsible for providing real-time data to one or more Administration & Data Servers at each administrator site. Administration Clients at the site receive their real-time data through a connection to a Administration & Data Server. Administration Clients do not have the local database and Administration & Data Server processes are required to receive real-time data directly from the CallRouter.

Administrator Sites

Administration & Data Servers can be located with one or both sides of the central controller, at a call center, or at another site. An administrator site is any site that contains Administration & Data Servers. Each administrator site requires at least one Administration & Data Server. You should use two Administration & Data Servers (as shown in [Administration and Data Server Planning, on page 3](#)) to provide fault tolerance in the real-time data distribution architecture.

The primary Administration & Data Server maintains an active connection to the real-time server through which it receives real-time data. The secondary Administration & Data Server also maintains connections to the real-time server; however, these connections remain idle until needed (for example, in cases where the primary Administration & Data Server is unavailable for some reason). In sites that have two Administration & Data Servers, the Administration Clients are configured to automatically switch to a secondary Administration & Data Server if the first distributor becomes non-functional for any reason.

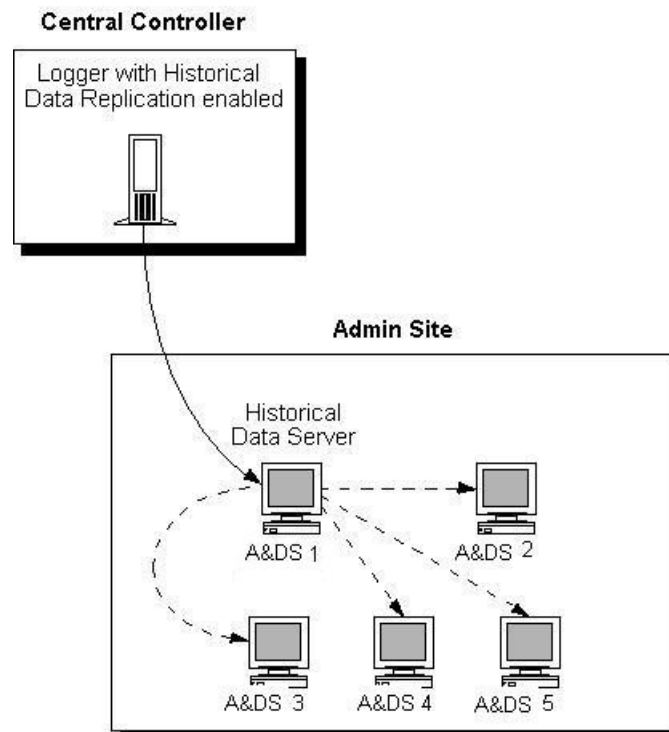
Administration Client Requirements

An Administration & Data Server can serve many Administration Clients. See the Contact Center Enterprise Compatibility Matrix at <https://www.cisco.com/c/en/us/support/customer-collaboration/unified-contact-center-enterprise/products-device-support-tables-list.html> for information about requirements.

Historical Data Servers

Historical data is stored both as individual call detail records and also rolled up and stored as interval records. An Administration & Data Server with a Historical Data Server (HDS) stores historical data that supports reporting queries. Administration & Data Servers at the site query historical data from the HDS rather than directly from the Logger.

Figure 2: Historical Data Server Architecture



To set up a Historical Data Server, you must configure the Logger to perform historical data replication. You must also configure the real-time Administration & Data Server as an HDS. You can then create an HDS database on the real-time distributor.

Information in the real-time feed tells each Administration Client where to obtain historical data. If the real-time distributor is a Historical Data Server, then it instructs its clients to get historical data from it. Otherwise, it instructs its clients to get historical data from the Logger.

Each Logger can support up to two HDSs. The Administration Server, Real-time and Historical Data Server, and Detail Data Server (AW-HDS-DDS) can be enabled only on the primary distributor. The AW-HDS-DDS server role is disabled on the secondary real-time Administration & Data Server.

HDS Features

The HDS eliminates the performance impact on the central database from multiple Administration & Data Servers accessing the central database to generate reports. In systems that have multiple remote Administration & Data Servers, the HDS brings Unified ICM historical reporting data closer to the user. Each HDS provides a set of database tables. You can set specific times for retaining data in these tables. These capabilities give you flexibility in setting up reporting capabilities on a site-by-site basis.

The Historical Data Server also provides:

- Greater flexibility in leveraging Internet applications.
- An open interface for data mining and data warehousing applications.
- Host for other database tables and have them work with the HDS.
- Improved security and data access capabilities.

See the Contact Center Enterprise Compatibility Matrix at <https://www.cisco.com/c/en/us/support/customer-collaboration/unified-contact-center-enterprise/products-device-support-tables-list.html> for information on HDS requirements.