



Test Bed 1: Case Study and Test Sites

This topic describes the sample business case study, Financial Business, developed to reflect real-world contact center deployments. This topic also provides information on the relationships, topology, components, and definitions of the Test Bed 1 sites, that was designed and tested as part of Cisco Unified Communications System Release 8.5(1) for the contact center family of products.

This topic contains the following sections:

- [Financial Business Case Study](#)
- [Unified IP IVR Test Sites](#)

Financial Business Case Study

Global Siren Financial (GSF), a global multi-billion dollar financial services firm, offers the following services to its customers:

- Brokerage services
- Securities sales
- Internet banking
- Account and collection services

Call Centers or Sites

GSF depends on its call centers to be the primary interface to its customers and brokers who resell their securities in the United States. The brokers need to have a reliable, cost effective, and efficient way to manage their customer contacts across the eight contact center sites. These sites participate in the Unified Communications Manager Post-Routed, Parent and Child and Outbound Option call flows testing.

For ease of use, the site names have been mapped to specific site numbers. [Table 1](#) lists the site name, the site number, the number of agents, and number of agents per Unified Communications Manager cluster, and the Busy Hour Call Attempt (BHCA) at each of the eight sites.



Note

BHCA numbers include all traffic; including inbound, outbound, transfer, and conference call volume.

Table 1 **Number of Agents at Sites**

Site Name	Site Number	BHCA	Number of Agents	Agents/Cluster
Canton, KS [multi-site hub/data center]	Site1	n/a	no agents	Cluster 1: 1,294 (includes 300 mobile agents)
Chicago, IL [call center and remote of Site1/Site4]	Site2	8,694	452	
Clifton, TX [call center and remote of Site1/Site4]	Site3	10,746	542	
Clinton, MO [backup multi-site hub/data center]	Site4	n/a	no agents	
Clover, UT [small data center and call center]	Site5	2,106 (72,000 for outbound calls)	103 (Additional 1000 outbound agents)	Cluster 2: 141 (includes 103 GSF agents from Site5 and 38 agents from Site6)
Carefree, AZ [call center and remote of Site5]	Site6	684	38	Cluster 2 (in Site5)
Virtual Call Center (Cisco Unified Mobile Agents)	Site7	5,400	300	Cluster 1: 1294 (includes 994 site2 and Site3 local agents)
Casper, WY [child site and call center]	Site12	3,670	200	Cluster: 3

Cisco Unified Mobile Agents

With Cisco Unified Mobile Agent (Unified Mobile Agent) functionality, 300 mobile agents “grouped” in Site7 (a virtual call center) use their regular PSTN or cell phones to accept and handle call center calls. The mobile agents in Site7 are part of a GSF Pandemic Response Team created to ensure call center operations are not disrupted when a major emergency event could close the formal call centers. The mobile agents are grouped in skill groups modeled after Site2 and Site3 GSF customer service teams,

but are distributed across the country. These agents use a Cisco Enterprise Class Teleworker 881 VPN router at home with a cable modem for data connectivity and a GSF-supplied local POTS line to ensure voice quality for their calls.

Services and Skill Groups

Table 2 lists the services that the agents at the call centers provide to the customers of GSF.

Table 2 Services, Activities, and Locations

Skill #	Service	Activity	Locations
01	Account Inquiry	Statement Review, Balance Inquiry	All locations including mobile agents in Site7 Note Additionally, sub-groups have been created within this skill group to receive transfer and conference calls from other groups
02	Literature Request	Process requests for new prospectus and other literature for customers	All locations including mobile agents in Site7
04	Member Banking	Internet Banking Service for customers	All locations including mobile agents in Site7
05	Customer Collections	Credit Card collections and account services	Clover (Site5) (group of dedicated agents for outbound calls)
06	Catalog Orders	Take new orders from the GSF Catalog	Casper (Site12)

Cross-Trained Agents

GSF has cross-trained the majority of their agents at the various call center sites to provide a variety of account services to both end-customers and brokers who resell their securities.



Note

There are no agents handling calls at Canton (Site1) and Clinton (Site4); these are just data centers.

GSF offers a banking service to its customers with traditional checking, savings, and investment options like money market and 401K accounts as an *internet bank* with no traditional branch banking locations.

Chicago and Clifton Agents

The call centers in the Chicago (Site2) and Clifton (Site3) sites are set up to handle the above customer calls and services. These sites use the Computer Telephony Integration Object Server (CTI OS) Desktop Applications to handle call control functions.

Clover and Carefree Agents

Agents in the Clover (Site5) and Carefree (Site6) sites are also set up to handle similar calls, but use Cisco Agent Desktop (CAD) Applications for call control functions. A group of dedicated agents in Carefree (Site5) perform only outbound collection calls on their customer credit card accounts.

Casper Agents (Outsourced Agents)

GSF has acquired a small company in a geographical area that has no GSF call centers and integrated it into the parent company as a child site. Agents in Casper (Site12) receive calls that are routed to their call center from the parent sites (Site1/Site4). These sites use the Cisco Agent Desktop (CAD) Desktop Applications to handle call control functions.

Remote and Mobile Agents

Site7 acts as a virtual call center for all mobile agents associated with the call center sites that use their regular PSTN or cell phones to handle call center calls.

Site and Agent Profiles

All the sites discussed in this section are open 24x7. The number of agents listed in the tables are the number of staffed agents per shift.

Data Centers (Site1 & Site4)

Canton (Site1) and Clinton (Site4) are data centers. The following is a brief summary of site-relevant information:

- Have a distributed Unified ICME system that serves as the enterprise routing point for regular and outsourced calls
- Handle Unified Communications Manager Post-Routed and Parent and Child calls
- Use Unified IP IVR for call treatment and queuing
- Share a Unified Communications Manager cluster for call processing
- Have no agents

Chicago, IL (Site2)

The following is a brief summary of Site2-relevant information:

- Has 452 agents who use CTI OS Desktop Application
- Handles Unified Communications Manager Post-Routed calls
- Uses Unified IP IVR in Site1/Site4 for call treatment and queuing
- Uses Unified Communications Manager cluster in Site1/Site4 for call processing
- Operates as a call center for GSF customers

[Table 3](#) lists the skill sets of the agents at the Chicago site (total BHCA: 8,694) and the agent to BHCA numbers.

Table 3 Agent Profile for Chicago (Site2)

Call Flow	Skill Group and Service	Number of Agents	BHCA
Call Flow #1a	#21101 – Account Inquiry	149	2,718
Call Flow #1b	#21202 – Literature Request	82	1,638
Call Flow #1d	#21404 – Member Banking	191	3,798

Table 3 *Agent Profile for Chicago (Site2) (continued)*

Call Flow	Skill Group and Service	Number of Agents	BHCA
Call Flow #2a	#22101X – Transfers from Clifton (Site3)	15	270
Call Flow #2a	#22101C – Conferences from Clifton (Site3)	15	270

Clifton, TX (Site3)

The following is a brief summary of Site3-relevant information:

- Has 542 agents who use CTI OS Desktop Application
- Handles Unified Communications Manager Post-Routed calls
- Uses Unified IP IVR in Site1/Site4 for call treatment and queuing
- Uses Unified Communications Manager cluster in Site1/Site4 for call processing
- Operates as a call center for GSF customers

Table 4 lists the skill sets of the agents at the Clifton site (total BHCA: 10,746) and the agent to BHCA numbers.

Table 4 *Agent Profile for Clifton (Site3)*

Call Flow	Skills and Services	Number of Agents	BHCA
Call Flow #1a	#31101 – Account Inquiry	140	2,790
Call Flow #1b	#31202 – Literature Request	87	1,746
Call Flow #1d	#31404 – Member Banking	285	5,670
Call Flow #2a	#32101X – Transfers from Chicago (Site2)	15	270
Call Flow #2a	#32101C – Conferences from Chicago (Site2)	15	270

Clover, UT (Site5)

The following is a brief summary of Site5-relevant information:

- Has 103 core agents who use CAD Desktop Application to service GSF customers
- Has 1000 dedicated agents who place outbound calls to customers for collection services
- Core agents handle Unified Communications Manager Post-Routed calls
- Has its own Unified IP IVR for call treatment and queuing for both types of calls

Table 5 lists the skill sets of the agents at the Clover site (total BHCA: 74,106) and the agent to BHCA numbers.

Table 5 *Agent Profile for Clover (Site5)*

Call Flow	Skills and Services	Number of Agents	BHCA
Call Flow #1a	#51101 – Account Inquiry	25	450

Table 5 Agent Profile for Clover (Site5) (continued)

Call Flow	Skills and Services	Number of Agents	BHCA
Call Flow #1b	#51202 – Literature Request	6	108
Call Flow #1d	#51404 – Member Banking	72	1,296
Call Flow #3– Customer Collection	#53505 – Collections	1,000	72,000

For the outbound agents in this site that are dedicated to the Customer Collections skill group, the expected call distribution numbers with customers are as follows:

Calls Answered: 21,600 (30% of call volume)

Calls Busy: 25,200 (35% of call volume)

Calls Not Answered: 25,200 (35% of call volume)

Total Calls Dialed: 72,000

The following recorded message (timed to play for 60 seconds) is played for customer calls that are answered by an answering machine:

“We have an important message for you. Please contact Global Siren Financial Bank immediately at 1-888-555-1212. Thank you.”

Carefree, AZ (Site6)

The following is a brief summary of Site6-relevant information:

- Has a total of 38 agents who use CAD Desktop Application
- Handles Unified Communications Manager Post-Routed calls
- Uses Unified IP IVR in Site5 for call treatment and queuing
- Uses the Unified Communications Manager cluster in Site5 for call processing
- Operates as a call center for both inbound and outbound calls

Table 6 lists the skill sets of the agents at the Carefree site (total BHCA: 684) and the agent to BHCA numbers.

Table 6 Agent Profile for Carefree (Site6)

Site	Skills and Services	Number of Agents	BHCA
Call Flow #1a	#61101 – Account Inquiry	19	342
Call Flow #1b	#61202 – Literature Request	1	18
Call Flow #1d	#61404 – Member Banking	18	324

Virtual Call Center (Site7)

A *virtual* site was created to “group” all the mobile agents associated with the call center. The following is a brief summary of Site7-relevant information:

- Has 300 mobile agents who use regular PSTN or cell phones and CTI OS Agent Desktop to handle customer calls
- Uses Unified IP IVR in Site1/Site4 for call treatment and queuing
- Uses the Unified Communications Manager cluster in Site1/Site4 for call processing
- Operates as a virtual call center for inbound calls

Table 7 lists the skill sets of the mobile agents in the virtual call center (total BHCA: 5,400) and the agent to BHCA numbers.

Table 7 Agent Profile for Virtual Call Center (Site7)

Site	Skills and Services	Number of Agents	BHCA
Call Flow #1a	#71101 – Account Inquiry	150	2,700
Call Flow #1b	#71202 – Literature Request	30	540
Call Flow #1d	#71404 – Member Banking	120	2,160

Casper, WY (Site12)

The following is a brief summary of Site12-relevant information:

- Has 200 agents who use CAD Desktop Application
- Handles Parent and Child calls
- Uses Unified Contact Center Express (Unified CCX) at this site for call treatment and queuing
- Uses Unified Communications Manager cluster at this site for call processing
- Operates as a call center for GSF customers

Table 8 lists the skill set of the agents at the Casper site (total BHCA: 3,760) and the agent to BHCA numbers.

Table 8 Agent Profile for Casper (Site12)

Call Flow	Skill Group and Service	Number of Agents	BHCA
Call Flow #4a	#124606 – Distribution Center Catalog Orders	200	3,760

Sample Cisco Unified Communications Manager Post-Routed Call Flows

The four types of sample call flows discussed in this section are as follows:

- [Call Flow #1: General Information Calls \(Inbound\)](#)
 - Call Flow #1a—Account Inquiry Skill Group
 - Call Flow #1b—Literature Request Skill Group
 - Call Flow #1d—Member Banking Skill Group
- [Call Flow #2: Agent-Initiated Calls \(Conference/Transfers\)](#)
- [Call Flow #3: Collection Calls \(Outbound\)](#)
- [Call Flow #4: Outsourced Calls](#)
 - Call Flow #4a—Distribution Center Catalog Orders Skill Group

Call Handling Overview

Agents and the Unified Communications Manager clusters at the sites handling the call flows are set up as follows:

- Unified Communications Manager Cluster #1:
 - Unified Communications Manager cluster (CoW) at Site1/Site4
 - Agents are at Site2, Site3, and Site 7

Traffic between Site1/Site4 and Site2, Site3, and Site7 (in Cluster 1) is considered *intra-cluster* or occurring within their *home* cluster.
- Unified Communications Manager Cluster #2:
 - Unified Communications Manager cluster at Site5
 - Agents are at Site5 and Site6

Traffic between Site5 and Site6 is considered intra-cluster or occurring within their home cluster.
- Unified Communications Manager Cluster #3:
 - Agents at Site12

Typically, all call flows have inbound BHCA targeted for each specific site. As such, there should be adequate agents at each site to handle the inbound local BHCA sent to that site.

Furthermore, specific skill groups and sites are identified as targets for call *overflow* which occurs when agents are not available at the site that the call originally came in at (local site).

When a call arrives at the local site and agents are unavailable, the system checks for available agents in that skill group at other clustered sites. When selecting an overflow site, agents that belong to the home cluster are preferred over agents in a different cluster.

For instance, using the agent and cluster set up described above, a call that comes into Site5 is first sent to agents at Site5. If agents are unavailable at Site5, then the call is sent to available agents at Site6.

If agents are not available at any of the sites, the call is usually queued for an agent in that skill group at the local site (Site5 in this example). However, calls can be handled in a variety of ways depending on the call treatment logic and rules.

See [Summary of Call Handling and Queueing](#) to understand how calls are handled for the sample call flows described in this section.

Call Flow #1: General Information Calls (Inbound)

GSF provides its customers with toll-free numbers to call into their regional contact centers. Customers who call into these access numbers are presented with a menu of choices. Based on the selection they make, they are transferred to the agents at that site who provide that service for that region.

Agents and the Unified Communications Manager clusters at the sites handling the Unified Communications Manager Post-Routed call flow are set up as follows:

- Unified Communications Manager Cluster #1: Agents at Site2, Site3, and Site7
- Unified Communications Manager Cluster #2: Agents at Site5 and Site6

Table 9 provides a list of the sites and their local access numbers, estimated BHCA, and agents per site for General Information Requests lines.

Table 9 General Information Request Local Lines

Site	Local Number	Est. BHCA / Site	Agents / Site
Chicago, IL (Site2)	773-212-4636 (INFO)	8,154	422
Clifton, TX (Site3)	254-352-4636 (INFO)	10,206	512
Clover, UT (Site5)	435-233-4636 (INFO)	1,854	103
Carefree, AZ (Site6)	480-321-4636 (INFO)	684	38
Virtual Call Center (Site7)	254-352-5535	5,400	300 (mobile agents)



Note

All the BHCA numbers above are for inbound Unified Communications Manager Post-Routed calls; no outbound or conference/transfer call volume is included.

Call Flow Logic

The Unified IP IVR (at clusters #1 and #2) plays the following series of prompts and messages (of 10 second duration) for calls that come into the call centers:

“Thank you for calling Global Siren Financial. Please select from one of the following services:

- For your current account information and balances, press 1
- To request information on any of our banking or brokerage services, press 2
- To speak to a personal banker, press 3
- Or stay on the line to be transferred to a personal banker.”

If the caller presses:

- 1 and an agent is available for that skill group, the call is routed to any agent at the local site who has the ‘x1101 – Account Inquiry Skill.’
- 2 and an agent is available for that skill group, the call is routed to any agent at the local site who has the ‘x1202 – Literature Request Skill.’
- 3 and the agent is available for that skill group, the call is routed to any agent at the local site who has the ‘x1404 – Member Banking Skill.’

- An invalid selection, the system transfers the call to any agent in any site with the ‘x1404 – Member Banking Skill.’

If the user does not make a selection when prompted, the system transfers the call to any agent in any site in the Member Banking skill group.

Call Handling and Queueing

GSF has published toll-free numbers for each regional area to encourage local contact with the regional call centers. All calls coming into these toll free numbers will be *designated* to the specific site (or cluster of sites) the call arrived at. For example, calls from the Chicago (Site2) toll-free number are targeted to be answered by an agent in that skill group at that site (based on the longest available or most idle agent).

If there are no available agents, the call stays in a call queue at that site for the next available agent. Unnecessary intra-site call transfers and network usage are avoided by keeping the calls “local.”

Unanswered calls remain in their respective queues, regardless of the length of time they are in queue.

If there are more than 20 calls in any of these queues, the caller hears an announcement before being put on hold:

“We are experiencing heavier than normal call volumes. There are << *number of calls inserted from real time feed* >> ahead of you in this queue. You may wish to call back later for faster service.”

The system does not terminate this call. Callers who wish to wait are allowed to continue to hold in queue once this message is played. It is up to the caller’s discretion to hang up and terminate the call.

Agents/BHCA to Skill Group Breakdown

For the local-line inbound traffic dealing with General Information Requests, [Table 10](#) lists the BHCA and the number of agents available for each of the related skill groups at Chicago, Clifton, Clover, Carefree and the virtual call center.

Table 10 Agents/BHCA per Skill Group per Site

Site	BHCA/Agents	X1001-Acct	X1002-Lit	X1004-Bank	Collections	Total
Site2	BHCA	2,718	1,638	3,798	n/a	8,154
	Agents	191	82	145		422
Site3	BHCA	2,790	1,746	5,670	n/a	10,206
	Agents	140	87	285		512
Site5	BHCA	450	108	1,296	72,000 (outbound calls)	74,106
	Agents	25	6	69	1000 (outbound agents)	1,103
Site6	BHCA	342	18	324	n/a	684
	Agents	19	1	18		38
Site7	BHCA	2,700	540	2,160	n/a	5,400
	Agents	150	30	120		300

Call Flow #2: Agent-Initiated Calls (Conference/Transfers)

Once a call is answered by an agent, the agent may need to perform additional call processing manually using the conference and transfer features of contact center functionality.

Based on historical volumes, GSF expects that agents will need to transfer 5.0%. The original agent, as a courtesy, would conference customer calls to the another agent in the same skill group, instead of doing a *blind* transfer. The agent can stay on the line with the customer and introduce the customer to the new agent. This is a *consultative* transfer.

Call Handling and Queueing

Typically, calls conference/transfer between agents are designated to the same service or Unified Communications Manager cluster. For instance, Chicago (Site2) calls that transfer or conference typically only go to Clifton (Site3) as intra-cluster traffic.

Approximately, a total of 5% of calls are transferred and/or conferenced from Chicago (Site2) to Clifton (Site3).



Note

Sometimes, when a site accepts calls from multiple remote sites, a specific skill group may be set up and designated to accept just this inbound re-directed traffic.

Call Flow #3: Collection Calls (Outbound)

The outbound Collections skill group performs follow-up calls to GSF customers. For Site5, the Cisco Outbound Option (Outbound Option) system places outbound calls with an estimated 72,00 BHCA. The Collections group at Clover (Site5) has 1000 dedicated agents who make outbound calls using the *Collections* campaign. Approximately 30% of the total calls placed are successful as shown below:

Calls Answered: 21,600 (30% of call volume)

Calls Busy: 25,200 (35% of call volume)

Calls Not Answered: 25,200 (35% of call volume)

Total Calls Dialed: 72,000

Call Handling and Queueing

Outbound calls are handled by a predictive dialer where the system dials several calls at once. This is done since some of the calls do not complete due to bad numbers, busy lines, etc. When a customer answers the call, an agent is immediately connected to the customer to perform the collections request.

At the Clover (Site5) site, calls are made in the *Predictive Mode*, using agents from the '53505 – Collections' group to make the outbound collection calls as well as take any inbound calls meant for this skill group assignment.

If the outbound Campaign detects an answering machine, the system plays the following 60-second message to the customer before terminating the call:

"We have an important message for you – please contact Global Siren Financial Bank immediately at 1-888-555-1212. Thank you."

Call Flow #4: Outsourced Calls

GSF has acquired a small company in a geographical area that has no GSF call centers and integrated it into the parent company as a child site. Agents in Casper (Site12) receive calls that are routed to their call center from the parent sites (Site1/Site4). GSF has assigned outsourcer agents at Site12 to handle catalog order calls.

Table 11 provides the site and its internal redirect number, estimated BHCA, and agents in the site for the outsourced calls.

Table 11 Outsourcer Agents at Casper (Site12)

Site	Internal Redirect Number	Est. BHCA / Site	Agents / Site
Casper, WY (Site12)	307-232-3613 (Distribution Center Catalog Orders)	3,670	200



Note

Customers do not actually have to dial the *internal* redirect number. The carrier routes these calls on a percent allocation basis, for load-balancing purposes, between the two GSF locations (Site1 and Site4), which act as parent sites.

Call Flow Logic

The Unified CVP (cluster 2) plays the following series of prompts and messages (of 10 second duration) for the calls coming into the child site:

“Thank you for calling Siren Supplies & Stores, your call may be recorded for quality purposes. For catalog orders, please press 1”

If an agent is available at Site12, the call is routed to that agent.

Call Handling and Queueing

If there are no available agents, the call stays in a call queue at that site for the next available agent.

Unanswered calls remain in their respective queues, regardless of the length of time they are in queue.

The system does not terminate this call. Callers who wish to wait are allowed to continue to hold in queue once this message is played. It is up to the caller’s discretion to hang up and terminate the call.

Summary of Call Handling and Queueing

Based on routing scripts defined by the business logic, it can be seen that the contact center system handles and queues different types of calls in a variety of ways.

Table 12 summarizes this information and lists the different types of sample Unified Communications Manager Post-Routed and Parent and Child call flows discussed previously, the sites that are eligible to handle them, and their treatment by the contact center system.

Table 12 Summary of Call Handling and Queuing for Unified Communications Manager Post-Routed Call Flow Sites

Call Flow#	Call Type	Eligible Sites	Call Treatment by System
Call Flow #1	General Requests	Local site only	<ul style="list-style-type: none"> • If agent is logged on and available, transfers directly to agent. • Once queued locally, not permitted to cross to other sites, even within the same cluster. • Caller must terminate call by hanging up.
Call Flow #2	Agent-Initiated Conf/Transfers	All sites (wherever the agent is located)	<ul style="list-style-type: none"> • If agent is logged on and available, transfers directly to agent. • If agent is not logged on, plays message that agent is unavailable and terminates the call. • If agent is logged on but taking another call, places in queue for that agent and plays message to wait or terminate call.
Call Flow #3	Outbound Collection	Site5 handles outbound calls	<ul style="list-style-type: none"> • Uses predictive Outbound Option. • If called party answers, connects call to agent. • If called party does not answer, does not try the call again within campaign time.
Call Flow #4	Outsourced Calls	Local site only (Site12)	<ul style="list-style-type: none"> • Queues locally until agent is available. • Does not permit crossing to other sites. • Caller must terminate call by hanging up.

Unified IP IVR Test Sites

The following eight sites make up the multisite centralized and multisite distributed deployment models for testing the Unified Communications Manager Post-Routed call flow:

- Canton/[Site1: Data Center Site](#)
- Chicago/[Site2: Remote Site](#)
- Clifton/[Site3: Remote Site](#)
- Clinton/[Site4: Data Center Site](#)
- Clover/[Site5: Branch Office Site](#)
- Carefree/[Site6: Remote Site](#)
- Unified Mobile Agents/[Site7: Virtual Call Center](#)
- Casper/[Site12: Child Site](#)

See [Topology of Cisco Unified IP IVR Sites](#) for a complete map of the eight sites, their individual topologies, and the relationship between the sites. See [Table 13](#) for a comprehensive view of the different components deployed at the various Unified IP IVR sites. See [Unified IP IVR Site Definitions](#) for more information on the individual sites in Test Bed 1.

Site Relationships and Call Routing

Listed below are the relationships of the eight sites and the call routing deployed in Test Bed 1.

Multisite Centralized Site Relationships

- Site1 and Site4 are data centers and parent sites which *share* Unified CCE components over the WAN (CoW).
- Site1 and Site4 participate in one of the multisite centralized configurations and act as the hubs for Site2, Site3, and Site7 and as parent sites for Site12.
- Site5 has its own Unified Communications Manager cluster and participates in the other multisite centralized configuration.
- Site6 is a remote of Site5.
- Site7 acts as a virtual call center for mobile agents.
- Site12 is a child site and has its own Unified Communications Manager cluster, Unified CCX system and Unified CCGE.

Multisite Distributed Site Relationships

- In addition to Site1 and Site4, and Site5 and Site12 have Unified Communications Manager clusters resident at their sites for independent call processing locally.
- Site2, Site3, and Site7 depend on Site1/Site4 for providing call processing functionality and Site6 depends on Site5 for its call processing. Site12 calls are routed to its site from the parent sites.

Single Site Relationships

- Site12 has its own Unified Communications Manager cluster, Unified CCX system and Unified CCGE.

Call Routing

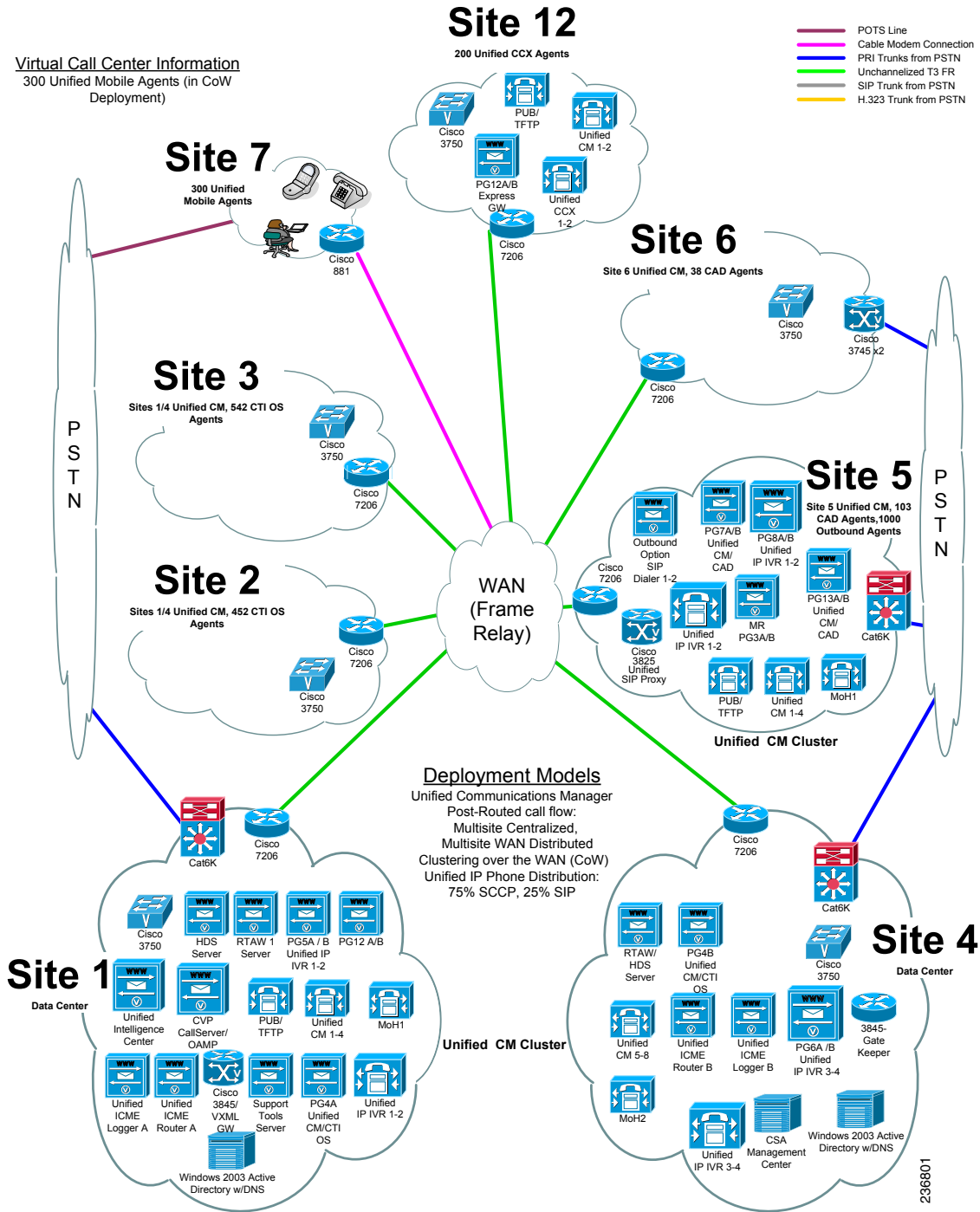
- General call flow—Customer calls come into Test Bed 1 via the data centers (Site1/Site4) and the branch office site (Site5).
- Unified Communications Manager Post-Routed Call Flow—Site1, Site4 and Site5 participate in this call flow and receive calls from the PSTN. Calls coming into these sites are routed over the WAN to agents at Site2, Site3, and Site6.
- Parent and Child Call Flow—Parent system at Site1/Site4 route calls from the PSTN to the child system in Site12 after providing initial call treatment.
- Outbound Option Call Flow—Site5 uses dedicated agents to participate in this call flow.
- Unified Mobile Agent Call Flow—Site7 mobile agents use Unified Mobile Agent functionality and their regular PSTN or cell phones to handle calls based on their skill groups. Calls are routed via Site1/Site4 gateways to the mobile agents' PSTN or cell phones.

[Tested Call Flows](#) discusses these call flows in greater detail.

Topology of Cisco Unified IP IVR Sites

The topology and relationships of the eight sites where Unified CCE with Unified IP IVR is deployed are shown in [Figure 1](#).

Figure 1 Unified IP IVR Sites in Test Bed 1



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Snapshot of Unified IP IVR Sites Components

Table 13 provides a comprehensive view of the different components deployed at the various Unified IP IVR sites. For specific component names and quantities, see [Unified IP IVR Site Definitions](#) for individual site descriptions and topologies.

Table 13 Comprehensive Unified IP IVR Sites Components List

Components	Site1	Site2	Site3	Site4	Site5	Site6	Site7	Site12
Hub/Data Center	X			X				
Branch Office					X			
Remote Site		X	X			X	X	
Parent Sites	X	X						
Single Child Site								X
Agents	0	452	542	0	103	38	300	200
BHCA	n/a	8,694	10,746	n/a	2,106	684	5,400	3,760
Unified Communications Manager Cluster	X			X	X			X
Music On Hold (MoH)	X			X	X			
HW Conference/MTP/Transcoder	X	X	X	X	X	X		
Unified ICME Router	X			X				
Unified ICME Logger	X			X				
RT AW	X			X				
HDS	X							
Cisco Unified Intelligence Center	X							
Peripheral Gateway (Unified Communications Manager/CTI OS/VRU)	X			X	X			
Peripheral Gateway (Unified Communications Manager/CAD)					X			X
Unified Contact Center Gateway Enterprise (Unified CCGE)								X
MR PG (coresident on Outbound Option)					X			
Access Switch	X	X	X	X	X	X		X
Distribution Switch	X			X	X			
SIP Gateway	X				X			
IOS (H.323) Gateway				X				
PSTN/VXML Gateway	X							

Table 13 Comprehensive Unified IP IVR Sites Components List (continued)

Components	Site1	Site2	Site3	Site4	Site5	Site6	Site7	Site12
MGCP Gateway					X			
AS5400XM Gateway: H.323 (Site 4), SIP (Site5)				X	X			
Gatekeeper				X				
WAN Router	X	X	X	X	X	X		X
Unified IP IVR	X			X	X			
Unified Contact Center Express								X
Outbound Option (SIP Dialer)					X			
Unified SIP Proxy					X			
CAD Server: coresident on Unified Communications Manager PG					X			
CTI/CTI OS Server: coresident on Unified Communications Manager PG	X			X				
CAD Agent/Supervisor Desktop					X	X		X
CTI OS Agent/Supervisor Desktop		X	X				X	
DHCP Server (on router)	X	X	X	X	X	X		X
Unified IP Phones (SCCP and SIP)	X	X	X	X	X	X		X
Cisco Security Agent	X	X	X	X	X	X		X
Unified Operations Manager	X	X	X	X	X	X		X
Third-Party Software	X	X	X	X	X	X		X

**Note**

Site7 has a Cisco Telecommuter Router 881 for connectivity to the data centers. Cisco 7507 is the core switch that provides Frame Relay services to the Unified IP IVR sites. 300 mobile agents in Site7 use regular PSTN or cell phones to accept and handle customer calls.

Unified IP IVR Site Definitions

The following section describes the eight sites that were created for the various deployment models in Test Bed 1 for testing Unified Communications Manager Post-Routed, Parent and Child and Outbound Option call flows. Each section in this section defines the design characteristics of an individual site and includes a logical topology map and a site equipment table.

Site1: Data Center Site

Site Profile

Site1 is the hub and the data center in a multisite distributed WAN configuration with Site4 as its backup hub. This site acts as the hub for Site2, Site3, and Site7 remote sites and as a parent site for Site12.

The test site is deployed as follows:

- Agents:
 - There are no agents and ingress calls are not answered at this site.
 - Site1 manages and services the agents located in Site2, Site3, and Site7.
 - Site1 provides initial call treatment and routes calls to outsourcer agents in Site12.
 - With the Unified Mobile Agent option, two CTI ports are provided for each mobile agent, which adds up to 600 CTI ports for the 300 mobile agents associated with Site7.
- Call Flows:
 - Unified IP IVR is used for menu prompting and call queue management of the Unified Communications Manager Post-Routed call flow and load sharing at Site1.
 - The SIP Ingress Gateway is used to terminate the traffic originating from the PSTN simulators.
- Call Processing/Routing:
 - A Unified ICME Router and Logger provide enterprise-wide Unified ICME capability by distributing voice and data from multiple channels to enterprise resources.
 - A Unified ICME Router and Logger (Side A) are located at this hub. There is a dedicated private and separate visible WAN connection to the Router and Logger (Side B) at Site4.
 - The central database is associated with the Logger. The Historical Database Server (HDS) is installed on the Real-Time Admin Workstation (RT AW).
 - Reporting functionality is provided by the Cisco Unified Intelligence Center (Unified Intelligence Center).
 - Unified IP IVR provides call treatment and queuing based on the type of post-routed calls coming into Site1.
- Infrastructure:
 - A Unified Communications Manager cluster has 1 first node and 4 subsequent nodes and a Music-on-Hold (MoH) server.
 - There are 2 types of Peripheral Gateways (PGs) implemented at Site1.
 - The Unified Communications Manager PG supports 1 Peripheral Interface Manager (PIMs) and communicates with the Unified Communications Manager cluster and CTI OS servers.
 - There is a duplexed VRU PG, which supports 2 PIMs, and communicates with the local Unified IP IVR servers.
 - The SIP Ingress Gateway acts as the voice gateway connected directly to the WAN and indirectly to the PSTN simulators.
 - A WAN router and DS3 link provide clustering over the WAN (CoW) private connectivity to the backup data center in Site4.
 - A DHCP Server (on the router) provides IP addresses to the admin Unified IP Phones that are needed for basic functionality testing.
 - Windows 2003 Active Directory provides the active directory structure and DNS services.

- Network Management:
 - Unified Operations Manager is used to monitor the entire network in Test Bed 1.
 - Perfmon is installed at this site to provide reporting and troubleshooting information.
- Redundancy and Failover:
 - The Unified Communications Manager cluster has been set up in 1:1 load sharing mode.
 - Failover capabilities are in place in Site4 for Unified Communications Manager.
 - The second Router and Logger at Site4 provides data center redundancy for this site.
- Security:
 - Cisco Security Agent is implemented as core endpoint security on all the servers.
 - McAfee Antivirus is installed on all the Window-based servers.

Figure 2 shows the logical topology of Site1.

Figure 2 Site1 Logical Topology

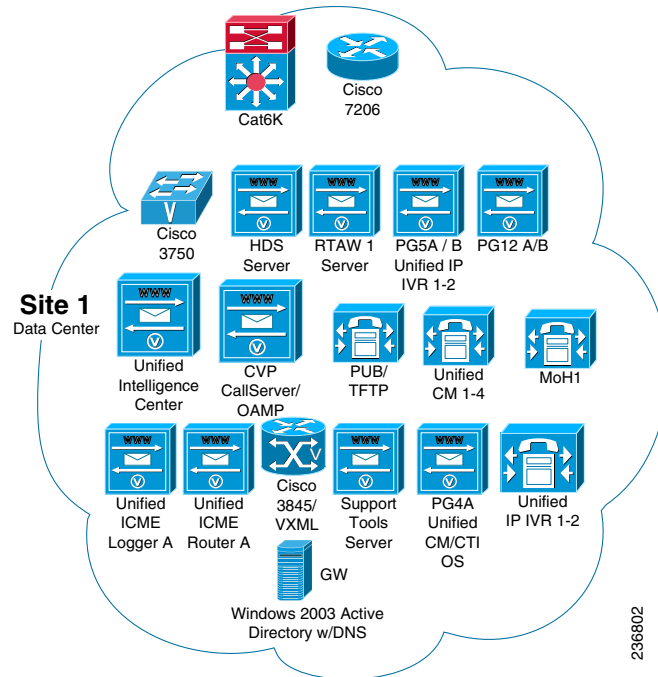


Figure 3 UCS B-Series Server Chassis Blade Layout for Site 1

Blade Details	Cisco UCS Chassis			
BLADE 8	For future Use	CS1-PG5A(1)	For future Use	For future Use
BLADE 7	CS1-LGRA(4)	CS1-PG12B(1)	For future Use	
BLADE 6	For future Use		CS1-PG12A(1)	
BLADE 5	CS1-HDS(4)		For future Use	
BLADE 4	For future Use	For future Use	For future Use	For future Use
BLADE 3	For future Use	For future Use	For future Use	CS1-PG5B(1)
BLADE 2	For future Use	For future Use	For future Use	For future Use
BLADE 1	CS1-RTRA (2)	CS1-ST1(1)	CS1-RTAW1(1)	CS1-PG4A(2)

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Table 14 lists the equipment, quantity and hardware platforms used in Site1. Use the reference information in the table to access corresponding software versions and model numbers.

Table 14 Site1 Equipment List

Component	Hardware Platform	Quantity
Access Switch	WS-C3750	1
Distribution Switch	WS-C6509	1
HW Conference/MTP/Transcoder	CISCO3845	1
Music on Hold (MoH)	MCS-7845	1
PSTN/VXML Gateway (SIP)	CISCO3845	3
Peripheral Gateway (Unified Communications Manager/CTI OS/VRU)	UCS-5108	1
Router	UCS-5108	1
Logger	UCS-5108	1
RT AW/HDS	UCS-5108	1
Unified CVP Call Server and OAMP	MCS-7845	1
Unified Communications Manager	MCS-7845	6
Unified IP IVR	MCS-7845	2
Unified Intelligence Center	MCS-7845	1
Support Tools	UCS-5108	1*
WAN Router	Cisco 7206VXR	1

**Note**

UCS-5108 (Unified Computing System 5108) is a blade server chassis which can handle multiple application servers running on the same chassis. For more information on UCS, please refer to the product guide at:

<http://www.cisco.com/en/US/products/ps10265/index.html>

For installation and configuration documentation on these components, see Components Installation and Configuration Guides at:

http://www.cisco.com/cisco/web/docs/iam/unified/ipcc851/Component_Installation_and_Configuration_Guides.html

Additional configuration information for contact center call flows and components is available at:

http://docwiki.cisco.com/wiki/Category:Unified_Communications_System_Implementation

Site2: Remote Site

Site Profile

Site2 is a small remote office of Site1 in the multisite centralized configuration. It participates in the multisite distributed WAN configuration.

The test site is deployed as follows:

- Agents:
 - 452 agents use CTI OS Desktop Application for call control functions.
 - Calls arriving and being processed here have a BHCA of 8,694.
- Call Flows:
 - Agents receive Unified Communications Manager Post-Routed call flows.
 - Agents in this site receive transfers and conferences from Site3.
- Infrastructure:
 - A WAN router and DS3 link provide connectivity to other sites through a Frame Relay cloud.
 - A DHCP Server (on the router) provides IP addresses to the Unified IP Phones at the site.
- Unified IP Phones:
 - 339 SCCP phones are located at this site.
 - 113 SIP phones are located at this site.
- Security:
 - Cisco Security Agent is implemented as core endpoint security on all the servers.
 - McAfee Antivirus is installed on all the Windows-based servers and the agent desktops.

Figure 4 shows the logical topology of Site2.

Figure 4 Site2 Logical Topology

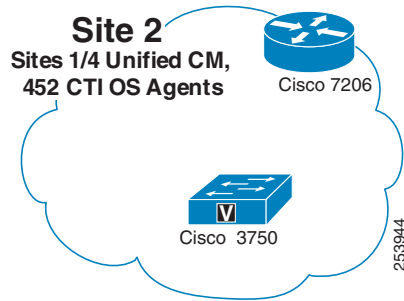


Table 15 lists the equipment, quantity and hardware platforms used in Site2. Use the reference information in the table to access corresponding software versions and model numbers.

Table 15 Site2 Equipment List

Component	Hardware Platform	Quantity
Access Switch	WS-C3750	1
CTI OS Agent and Supervisor Desktop	Windows XP and Vista	n/a
HW Conference/MTP/Transcoder	CISCO3845	1
Unified IP Phones	Unified IP Phones (SCCP and SIP) 794x/796x/797x	n/a
WAN Router	Cisco 7206VXR	1

For installation and configuration documentation on these components, see Components Installation and Configuration Guides at:

http://www.cisco.com/cisco/web/docs/iam/unified/ipcc851/Component_Installation_and_Configuration_Guides.html

Additional configuration information for contact center call flows and components is available at:

http://docwiki.cisco.com/wiki/Category:Unified_Communications_System_Implementation

Site3: Remote Site

Site Profile

Site3 is a medium remote site of Site1 in the multisite distributed configuration. It participates in the multisite distributed WAN configuration.

The test site is deployed as follows:

- Agents:
 - 542 agents use CTI OS Desktop Application for call control functions
 - Calls arriving and being processed here have a BHCA of 10,746.
- Call Flows:
 - Agents receive Unified Communications Manager Post-Routed call flows.

- Agents in this site receive transfers and conferences from Site2.
- Infrastructure:
 - A WAN router and DS3 link provide connectivity to other sites through a Frame Relay cloud.
 - A DHCP Server (on the router) provides IP addresses to the Unified IP Phones at the site.
- Unified IP Phones:
 - 407 SCCP phones are located at this site.
 - 135 SIP phones are located at this site.
- Security:
 - Cisco Security Agent is implemented as core endpoint security on all the servers.
 - McAfee Antivirus is installed on all the Windows-based servers and the agent desktops.

Figure 5 shows the logical topology of Site3.

Figure 5 Site3 Logical Topology

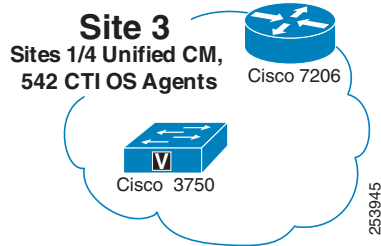


Table 16 shows the equipment, quantity and hardware platforms used in Site3. Use the reference information in the table to access corresponding software versions and model numbers.

Table 16 Site3 Equipment List

Component	Hardware Platform	Quantity
Access Switch	WS-C3750	1
CTI OS Agent and Supervisor Desktop	Windows XP and Vista	n/a
HW Conference/MTP/Transcoder	CISCO3845	1
Unified IP Phones	Unified IP Phones (SCCP and SIP) 794x/796x/797x	n/a
WAN Router	Cisco 7206VXR	1

For installation and configuration documentation on these components, see Components Installation and Configuration Guides at:

http://www.cisco.com/cisco/web/docs/iam/unified/ipcc851/Component_Installation_and_Configuration_Guides.html

Additional configuration information for contact center call flows and components is available at:

http://docwiki.cisco.com/wiki/Category:Unified_Communications_System_Implementation

Site4: Data Center Site

Site Profile

Site4 is a redundant hub and the backup data center for Site1 with which it participates in a multisite centralized configuration for Site2, Site3, and Site7. It is also a parent site for Site12. It also participates in the multisite distributed WAN configuration.

The test site is deployed as follows:

- Agents:
 - There are no agents and ingress calls are not answered at this site.
 - Two CTI ports are provided for each mobile agent, which adds up to 600 CTI ports for the 300 mobile agents in Site7.
- Call Flows:
 - This site acts as a backup to Site1 and helps Site1 manage and service the agents at Site2, Site3, and Site7.
 - Site4 provides initial call treatment and routes calls to outsourcer agents in Site12.
 - Unified IP IVR is used for menu prompting, call queue management, and load sharing of the Unified Communications Manager Post-Routed call flow at Site1.
 - Cisco AS5400XM gateway acts as a H.323 gateway into this site and is used to terminate the traffic originating from the PSTN simulators.
 - Cisco AS5400XM gateway originates outbound calls to mobile agents.
- Call Processing/Routing:
 - A Unified ICME Router and Logger (Side B) are located at this hub. There is a dedicated private and separate visible WAN connection to the other Router and Logger (Side A) in Site1.
 - HDS is installed on the RT AW.
 - Unified IP IVR provides call treatment and queuing to the post-routed calls coming into Site4.
- Infrastructure:
 - A Unified Communications Manager cluster has 4 subsequent nodes and a Music-on-Hold server.
 - There are 2 types of PGs implemented at Site4.
 - The Unified Communications Manager PG supports 1 Peripheral Interface Manager (PIMs) and communicates with the Unified Communications Manager cluster and CTI OS servers.
 - There is a duplexed VRU PG, which supports 2 PIMs, and communicates with the local Unified IP IVR servers.
 - One gatekeeper performs call control.
 - A WAN router and DS3 link provide connectivity to other sites through a Frame Relay cloud.

- A DHCP Server (on the router) provides IP addresses to the Unified IP Phones at the site.
- Windows 2003 Active Directory provides the active directory structure and DNS services.
- Network Management:
 - Unified Operation Manager is used to monitor the entire network in Test Bed 1.
 - Perfmon is installed at this site to provide reporting and troubleshooting information.
- Redundancy and Failover:
 - The Unified Communications Manager cluster has been set up in 1:1 load sharing mode.
 - Failover capabilities are in place in Site1 for Unified Communications Manager.
 - Redundancy Router and Logger are in place with the other Router and Logger (Side A) located in Site1.
- Security:
 - Cisco Security Agent is implemented as core endpoint security on all the servers.
 - McAfee Antivirus is installed on all the Windows-based servers.

Figure 6 is a logical topology of Site4.

Figure 6 Site4 Logical Topology

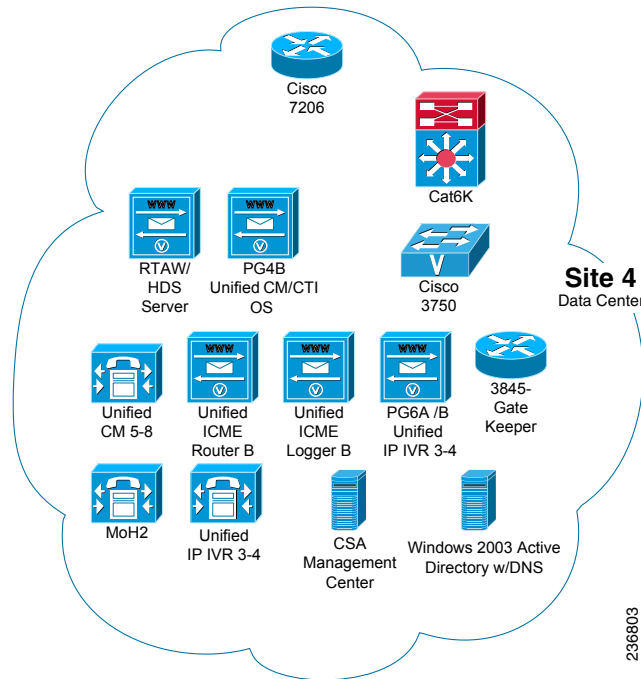


Table 17 lists the equipment, quantity and hardware platforms used in Site4. Use the reference information in the table to access corresponding software versions and model numbers.

Table 17 Site4 Equipment List

Component	Hardware Platform	Quantity
Access Switch	WS-C3750	1
Distribution Switch	WS-C6509	1
Gatekeeper	CISCO3845	1
HW Conference/MTP/Transcoder	CISCO3845	1
HDS	MCS-7845	1
Music on Hold (MoH)	MCS-7845	1
PSTN/VXML Gateway (H.323)	CISCO3845	2
Peripheral Gateway (Unified Communications Manager/CTI OS/VRU)	MCS-7845	3
Router	MCS-7845	1
Logger	MCS-7845	1
RT AW	MCS-7845	1
Unified Communications Manager	MCS-7845	5
Unified IP IVR	MCS-7845	2
WAN Router	Cisco 7206VXR	1

For installation and configuration documentation on these components, see Components Installation and Configuration Guides at:

http://www.cisco.com/cisco/web/docs/iam/unified/ipcc851/Component_Installation_and_Configuration_Guides.html

Additional configuration information for contact center call flows and components is available at: http://docwiki.cisco.com/wiki/Category:Unified_Communications_System_Implementation

Site5: Branch Office Site

Site Profile

Site5 is a medium remote branch office in a multisite centralized configuration for Site6. It also participates in the multisite distributed WAN configuration.

The test site is deployed as follows:

- Agents:
 - 103 agents handle inbound calls which have a BHCA of 2,106.
 - 1000 agents handle only outbound credit card collections calls which have a BHCA of 72,000.
 - Agents at this site use Cisco Agent Desktop (CAD) Application for call control functions.
- Call Flows:
 - Agents receive Unified Communications Manager Post-Routed call flows.
 - Unified IP IVR servers at Site5 provide local call treatment, management, and queuing.

- The MGCP gateway is the voice gateway that is used to accept calls originating from the PSTN simulators. It routes the calls to the local agents or to the WAN gateway for other sites if the local agents are not available.
- The SIP Dialer on the colocated Outbound Option communicates with Cisco Unified SIP Proxy (Unified SIP Proxy) to place outbound customer calls.
- Infrastructure:
 - A small Unified Communications Manager cluster has 1 first node and 2 subsequent nodes and one MoH server.

The Unified Communications Manager PG supports 1 Peripheral Interface Manager (PIMs) and communicates with the Unified Communications Manager cluster, CAD servers, and the Outbound Option server in Site6.

There is a duplexed VRU PG, which supports 2 PIMs, and communicates with the local Unified IP IVR servers.

 - A duplexed MR PG, which supports 1 PIM, communicates with the SIP Dialer on the colocated Outbound Option to select available agents and routes calls to them.
 - A WAN router and DS3 link provide connectivity to other sites through a Frame Relay cloud.
 - A DHCP Server (on the router) provides IP addresses to the Unified IP Phones at the site.
- Unified IP Phones:
 - 828 SCCP phones are located at this site.
 - 275 SIP phones are located at this site.
- Security:
 - Cisco Security Agent is implemented as core endpoint security on all the servers.
 - McAfee Antivirus is installed on all the Windows-based servers and the agent desktops.

Figure 7 shows the logical topology of Site5.

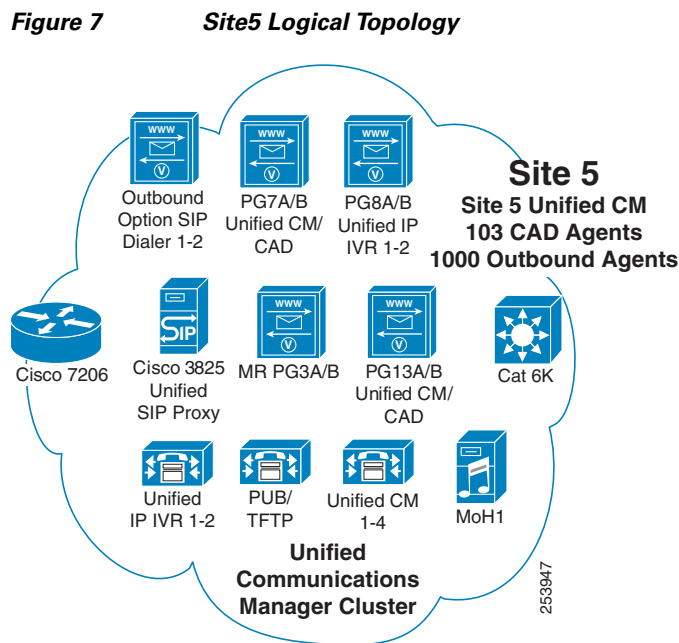


Table 18 lists the equipment, quantity and hardware platforms used in Site5. Use the reference information in the table to access corresponding software versions and model numbers.

Table 18 Site5 Equipment List

Component	Hardware Platform	Quantity
Access Switch	WS-C3750G-48PS-S	2
Cisco Agent and Supervisor Desktop	Windows XP and Vista	n/a
Distribution Switch	WS-C6506	1
HW Conference/MTP/Transcoder	CISCO3845	2
Music On Hold (MoH)	MCS-7845	1
PSTN/VXML Gateways (MGCP & SIP)	CISCO3845	2
PSTN/VXML Gateway (SIP)	Cisco AS5400XM	2
Peripheral Gateway (MR PG)	MCS-7845	2
Peripheral Gateway (Unified Communications Manager/CAD/VRU)	MCS-7845	6
Outbound Option (SIP Dialer)	MCS-7845	2
Unified Communications Manager	MCS-7845	6
Unified IP IVR	MCS-7845	2
Unified IP Phones	Unified IP Phones (SCCP and SIP) 794x/796x/797x	n/a
Unified SIP Proxy	CISCO3825	1
WAN Router	Cisco 7206VXR	1

For installation and configuration documentation on these components, see Components Installation and Configuration Guides at:

http://www.cisco.com/cisco/web/docs/iam/unified/ipcc851/Component_Installation_and_Configuration_Guides.html

Additional configuration information for contact center call flows and components is available at:

http://docwiki.cisco.com/wiki/Category:Unified_Communications_System_Implementation

Site6: Remote Site

Site Profile

Site6 is a small remote office of Site5 which participates in the multisite centralized configuration. It also participates in the multisite distributed WAN configuration.

The test site is deployed as follows:

- Agents:
 - A total of 38 agents use Cisco Agent Desktop (CAD) Application for call control functions.
 - Calls arriving and being processed at this site have a BHCA of 684.
- Call Flows:

- Agents receive Unified Communications Manager Post-Routed call flows.
- Infrastructure:
 - A WAN router and DS3 link provide connectivity to other sites through a Frame Relay cloud.
 - A DHCP Server (on the router) provides IP addresses to the Unified IP Phones at the site.
- Unified IP Phones:
 - 29 SCCP phones are located at this site.
 - 9 SIP phones are located at this site.
- Security:
 - Cisco Security Agent is implemented as core endpoint security on all the servers.
 - McAfee Antivirus is installed on all the Windows-based servers and the agent desktops.

Figure 8 shows the logical topology of Site6.

Figure 8 Site6 Logical Topology

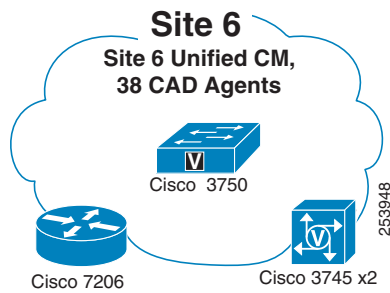


Table 19 lists the equipment, quantity and hardware platforms used in Site6. Use the reference information in the table to access corresponding software versions and model numbers.

Table 19 Site6 Equipment List

Component	Hardware Platform	Quantity
Access Switch	WS-C3750	1
Cisco Agent and Supervisor Desktop	Windows XP and Vista	n/a
Unified IP Phones	Unified IP Phones (SCCP and SIP) 794x/796x/797x	n/a
WAN Router	Cisco 7206VXR	1

For installation and configuration documentation on these components, see Components Installation and Configuration Guides at:

http://www.cisco.com/cisco/web/docs/iam/unified/ipcc851/Component_Installation_and_Configuration_Guides.html

Additional configuration information for contact center call flows and components is available at:

http://docwiki.cisco.com/wiki/Category:Unified_Communications_System_Implementation

Site7: Virtual Call Center

Site Profile

Site7 is the virtual site of mobile agents. Site7 participates in the multisite centralized configuration with Site1/Site4 (cluster #1) and in the multisite distributed WAN configuration.

The test site is deployed as follows:

- Agents:
 - There are 300 mobile agents logically grouped in Site7 who use their regular PSTN and cell phones to handle customer calls.
 - These agents are associated with agents in Site2 and Site3.
 - Calls arriving and being processed at this site have a BHCA of 5,400.
- Infrastructure:
 - A WAN router and DS3 link provide connectivity to other sites through a Frame Relay cloud.
- Remote Phones:
 - Mobile agents use regular PSTN and cell phones that are not controlled by Unified CCE.

Figure 9 shows the logical topology of Site7.

Figure 9 Site7 Logical Topology



Table 20 lists the equipment, quantity and hardware platforms used in Site7. Use the reference information in the table to access corresponding software versions and model numbers.

Table 20 Site7 Equipment List

Component	Hardware Platform	Quantity
Teleworker Access Router	Cisco Teleworker 881	1
Cisco Agent and Supervisor Desktop	Windows XP and Vista	n/a

For installation and configuration documentation on these components, see Components Installation and Configuration Guides at:

http://www.cisco.com/cisco/web/docs/iam/unified/ipcc851/Component_Installation_and_Configuration_Guides.html

Additional configuration information for contact center call flows and components is available at:

http://docwiki.cisco.com/wiki/Category:Unified_Communications_System_Implementation

Site12: Child Site

Site Profile

Site12 is a medium single site that participates as a child site in the multisite distributed WAN configuration with parent sites Site1/Site4.

The test site is deployed as follows:

- Agents:
 - 200 outsourcer agents use CAD Desktop Application for call control functions.
 - Calls arriving and being processed at this site have a BHCA of 3,670.
- Call Flows:
 - Agents receive Parent and Child call flows.
 - Unified CCX provides local call treatment, management, and queuing.
 - Parent system inSite1/Site4 routes the calls to the child system and agents at this site.
- Call Processing/Routing:
 - Unified ICME Router and Logger provides enterprise-wide Unified ICME capability by distributing voice and data from multiple channels to enterprise resources.
 - Unified CCX provides call treatment and queuing based on the type of post-routed calls coming into this site.
- Infrastructure:
 - A small Unified Communications Manager cluster has 1 first node and 2 subsequent nodes.
 - Unified CCGE is used to communicate with the local Unified Communications Manager cluster, Unified CCX, and CTI OS servers.
 - A WAN router and DS3 link provide connectivity to other sites through a Frame Relay cloud.
 - A DHCP Server (on the router) provides IP addresses to the Unified IP Phones at the site.
- Unified IP Phones:
 - 150 SCCP phones are located at this site.
 - 50 SIP phones are located at this site.
- Security:
 - Cisco Security Agent is implemented as core endpoint security on all the servers.
 - McAfee Antivirus is installed on all the Windows-based servers and the agent desktops.

Figure 10 shows the logical topology of Site12.

Figure 10 Site12 Logical Topology

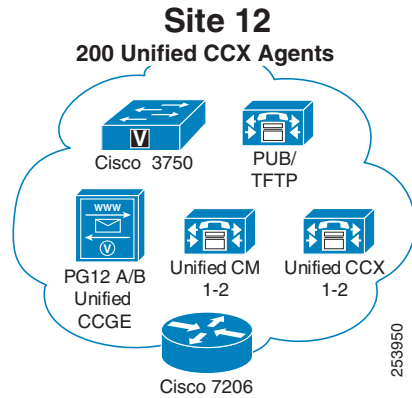


Table 21 lists the equipment, quantity and hardware platforms used in Site12. Use the reference information in the table to access corresponding software versions and model numbers.

Table 21 Site12 Equipment List

Component	Hardware Platform	Quantity
Access Switch	WS-C3750	1
CAD Agent and Supervisor Desktop	Windows XP and Vista	n/a
Unified CCGE	MCS-7845	2
Unified Communications Manager	MCS-7845	3
Unified CCX	MCS-7845	2
Unified IP Phones	Unified IP Phones (SCCP & SIP) 794x/796x/797x	n/a
WAN Router	Cisco 7206VXR	1

For installation and configuration documentation on these components, see Components Installation and Configuration Guides at:

http://www.cisco.com/cisco/web/docs/iam/unified/ipcc851/Component_Installation_and_Configuration_Guides.html

Additional configuration information for contact center call flows and components is available at:

http://docwiki.cisco.com/wiki/Category:Unified_Communications_System_Implementation