



Test Bed 2: Case Study and Test Sites

This topic describes the sample business case study, Outsourced Call Centers, developed to reflect real-world contact center deployments. This topic also provides information on the relationships, topology, components, and definitions of the Test Bed 2 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:

- [Outsourced Call Centers Case Study](#)
- [Parent and Child Test Sites](#)

Outsourced Call Centers Case Study

Sample Business Requirements

Over the years, Global Services Financial (the company discussed in the Financial Business case study) has noticed a decline in call volumes at the call centers as more customers use GSF's web site for services. Rather than closing or consolidating the call centers, GSF has contracted their services on an outsourced basis to one of their partner companies, Siren Supplies and Stores (SS&S). A parent and child business model has been implemented for this particular case study, where two sites in the GSF organization act as parent sites and two existing call centers, and a new call center, act as child sites.

In this parent and child business model, SS&S customer calls are routed from the two parent sites to three child call center sites and handled by outsourcer agents in these sites. GSF still routes some of its own customer calls directly from the PSTN to core GSF agents at two of these outsourcer sites.

[Table 1](#) lists the site name, the site number, the number of agents answering GSF (core) and SS&S (outsourcer) calls, and the related BHCA at these sites.



Note

There are no agents handling calls at Canton (Site1) and Clinton (Site4), these sites route calls to agents in the child sites.

Table 1 Number of Outsourcer Agents at Sites

Site Name	Site Number	BHCA	Number of Agents	Agents/Cluster
Canton, KS [parent site]	Site1	n/a	no agents	n/a
Clinton, MO [parent site]	Site4	n/a	no agents	n/a
Core Agents for GSF				
Clover, UT [small data center and call center]	Site5	9,240	497	Cluster 1: 657 (includes all agents at Site5)
Clovis, NM [small data center and call center]	Site8	1,350	75	Cluster 2: 300 (includes all agents at Site8)
Outsourcer Agents for SS&S				
Clover, UT [child site, small data center and call center]	Site5	2,880	160	Cluster 1: 657 (includes all agents at Site5)
Clovis, NM [child site, small data center and call center]	Site8	2,700 (4,500 for outbound calls)	150 (additional 75 outbound agents)	Cluster 2: 300 (includes all agents at Site8)
Carson City, NV [child site, small data center and call center]	Site9	2,106	117	Cluster 3: 117

Cross-Trained Agents

Like GSF, SS&S 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.

SS&S has 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 just route calls to agents in the child sites.

At the Clover (Site5) and Clovis (Site8) sites, specific agent and skill groups have been set up for the outsourcer agents who service SS&S customers only. In addition to these outsourcer agents, Clover (Site5) and Clovis (Site8) still have dedicated GSF agents that handle inbound GSF customer calls. Clovis (Site8) agents also handle outbound collection GSF calls. There is no blending of these *core* GSF agents with the outsourcer agents at these sites. Agents at Clover (Site5) and Clovis (Site8) use CTI OS Applications for call control functions.

Carson City (Site9) has no GSF agents. All agents at this site are outsourcer agents that service only SS&S customers. Agents at Carson City (Site9) use CAD Applications for call control functions.

Services and Skill Groups

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

Table 2 *Services, Activities, and Locations*

Skill #	Service	Activity	Locations
01	Account Inquiry	Statement Review, Balance Inquiry	All locations except Carson City (Site9)
02	Literature Request	Process requests for new prospectus and other literature for customers	All locations except Carson City (Site9)
04	Member Banking	Internet Banking Service for customers	All locations except Carson City (Site9)
05	Customer Collections	Credit Card collections and account services	Clovis (Site8) (group of dedicated agents for outbound calls)
06	Catalog Orders	Take new orders from the SS&S Catalog	Clover (Site5), Clovis (Site8) and Carson City (Site9)
07	Order Status	Answer inquiries on prior catalog orders	Clover (Site5), Clovis (Site8) and Carson City (Site9)
08	Computer Technical Support	Help customers requiring technical assistance	Clover (Site5), Clovis (Site8) and Carson City (Site9)

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.

Parent Sites (Site1 & Site4)

The following is a brief summary of Site1/4-relevant information:

- Act as parent sites in the parent and child business model
- Have a distributed Unified ICME system that serves as the enterprise routing point for outsourced calls
- Handle Parent and Child calls
- Use Unified CVP for call treatment and queuing
- Have no agents

Clover, UT (Site5)

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

- Acts as a child site in the parent and child business model
- A small data center and call center for both GSF and SS&S customers

- Uses 497 core GSF agents to handle GSF customer calls that come directly to this site via PSTN gateways
- Uses 160 outsourcer agents to handle SS&S customer calls that come to this site via Site1 and Site 4 parent sites
- Agents at this site use CTI OS Desktop Application to handle Parent and Child calls
- Has its own Unified Communications Manager cluster for processing both GSF calls and outsourcer calls for this site
- Has its own Unified IP IVR for call treatment and queuing for both types of calls

Table 3 lists the skill sets of the agents at the Clover site and the agent to BHCA numbers.

Table 3 Agent Profile for Clover (Site5)

Call Flow	Skills and Services	Number of Agents	BHCA
Core Agents for GSF Customers (total BHCA: 9,240)			
Call Flow #1a	#51101 – Account Inquiry	158	3,072
Call Flow #1b	#51202 – Literature Request	158	2,976
Call Flow #1d	#51404 – Member Banking	157	3,000
Call Flow #2a	#52201X – Transfers within Site5	12	96
Call Flow #2a	#52201C – Conferences within Site5	12	96
Outsourcer Agents for SS&S Customers (total BHCA: 2,880)			
Call Flow #4a	#54606 – Distribution Center Catalog Orders	42	756
Call Flow #4b	#54707 – Distribution Center Order Status	47	846
Call Flow #4c	#54808 – Retail Center Computer Technical Support	71	1,278

Clovis, NM (Site8)

The following is a brief summary of Site8-relevant information:

- Acts as a child site in the parent and child business model
- A small data center and call center for both GSF and SS&S customers
- Uses 75 core GSF agents to handle inbound GSF customer calls that come directly to this site via PSTN gateways
- Uses 150 outsourcer agents to handle inbound SS&S customer calls that come to this site via Site1 and Site 4 parent sites
- Has 75 dedicated agents who place outbound calls to SS&S customers for collection services
- Agents at this site use CTI OS Desktop Application to handle Parent and Child calls only
- Has its own Unified Communications Manager cluster for processing both GSF calls and outsourcer calls for this site
- Has its own Unified CVP for call treatment and queuing for both types of calls

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: 1,350 (30% of call volume)

Calls Busy: 1,575 (35% of call volume)

Calls Not Answered: 1,575 (35% of call volume)

Total Calls Dialed: 4,500

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 Siren Supplies & Stores immediately at 1-888-555-1212. Thank you.”

Table 4 lists the skill sets of the agents at the Clovis site and the agent to BHCA numbers.

Table 4 Agent Profile for Clovis (Site8)

Site	Skills and Services	Number of Agents	BHCA
Core Agents for GSF Customers (total BHCA: 1,350)			
Call Flow #1a	#81101 – Account Inquiry	36	648
Call Flow #1b	#81202 – Literature Request	8	144
Call Flow #1d	#81404 – Member Banking	31	558
Outsourcer Agents for SS&S Customers (total BHCA: 7,200)			
Call Flow #3 – Customer Collection	#83505 – Collections	75	4,500
Call Flow #4a	#84606 – Distribution Center Catalog Orders	38	684
Call Flow #4b	#84707 – Distribution Center Order Status	44	792
Call Flow #4c	#84808 – Retail Center Computer Technical Support	68	1,224

Carson City, NV (Site9)

The following is a brief summary of Site9-relevant information:

- Acts as a child site in the parent and child business model
- Is a small data center and call center for SS&S customers only
- Has 117 outsourcer agents to handle inbound SS&S customer calls that come to this site via Site1 and Site 4 parent sites
- Agents at this site use CAD Desktop Application to handle Parent and Child calls
- Has its own Unified Communications Manager cluster for call processing
- Has its own Unified IP IVR for call treatment and queuing

Table 5 lists the skill sets of the agents at the Carson City site (total BHCA: 2,106) and the agent to BHCA numbers.

Table 5 Agent Profile for Carson City (Site9)

Site	Skills and Services	Number of Agents	BHCA
Call Flow #4a (outsourced calls)	#94606 – Distribution Center Catalog Orders (outsourcer agents only)	27	486
Call Flow #4b (outsourced calls)	#94707 – Distribution Centerboard Status (outsourcer agents only)	32	576
Call Flow #4c (outsourced calls)	#94808 – Retail Center Computer Technical Support (outsourcer agents only)	58	1,044

Sample Call Flows

The sample call flows created for this business case study reflect the typical retail customer business requirements. These sample call flows exercise specific features and functions of the contact center environment.

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 \(SS&S\) Calls](#)
 - Call Flow #4a—Distribution Center Catalog Orders Skill Group
 - Call Flow #4b—Distribution Center Orders Status Skill Group
 - Call Flow #4c—Retail Center Computer Technical Support 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 at Site5
 - Agents are at Site5 (GSF and outsourcer calls)
- Unified Communications Manager Cluster #2:
 - Unified Communications Manager cluster at Site8
 - Agents are at Site8 (GSF, outbound and outsourcer calls)

Traffic between Site5 and Site8 (occurring between Cluster 1 and Cluster 2) is considered *inter-cluster* or crossing between clusters.

- Unified Communications Manager Cluster #3:

- Unified Communications Manager cluster at Site9
- Agents are at Site9 (outsourcer calls)

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.

If agents are not available at the local site, the call is usually queued for an agent in that skill group at the local site.

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 and Unified CVP Post-Routed call flows are set up as follows:

- Unified Communications Manager Cluster #1: Agents at Site5
- Unified Communications Manager Cluster #2: Agents at Site8

[Table 6](#) provides a list of the sites and their local access numbers, estimated BHCA, and agents per site for General Information Requests lines.

Table 6 **General Information Request Local Lines**

Site	Local Number	Est. BHCA / Site	Agents / Site
Clover, UT (Site5)	435-233-4636 (INFO)	9,048	497
Clovis, NM (Site8)	575-858-4636 (INFO)	1.350	75



Note

All the BHCA numbers above are for inbound (GSF only) Unified Communications Manager Post-Routed and Unified CVP Post-Routed calls; no outbound or conference/transfer call information is included.

Call Flow Logic

The Unified IP IVR (at clusters #1 and #3) or Unified CVP (at cluster #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 Services 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.’

If the user does not make a selection when prompted, after multiple requests for a response, the system plays a courtesy message and disconnects the user.

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 the call arrived at. For example, calls from the Clover (Site5) toll-free number are targeted to be answered by an agent in a selected 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. The number of calls in any of these queues is controlled by a variable in an *admin script*, which varies based upon conditions such as agent-to-call ratios, and so on.

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 7](#) lists the BHCA and the number of agents available for each of the related skill groups at Clover and Clovis.

Table 7 Agents/BHCA per Skill Group per Site

Site	BHCA/Agents	X1001-Acct	X1002-Lit	X1004-Bank	Total
Site5	BHCA	3,072	2,976	3,000	9,048
	Agents	158	158	157	473
Site8	BHCA	648	144	558	5,850
	Agents	36	8	31	150



Note

The BHCA listed in this table is per site. The BHCA and agent numbers listed in this table for the different sites do not include any outbound information or conference/transfer calls.

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 2.0% of all calls terminating with them using a post-route that they have initiated. Additionally, another 2.0% of conferences would be comprised of premium customers, who are identified by the system when they call a special toll-free number. The original agent, as a courtesy, would conference premium customer calls to an agent within the same skill group, instead of doing a *blind* transfer.

Typically, calls conference/transfer between agent groups are designated to the same service or Unified Communications Manager cluster. For instance, Clover (Site5) calls are transferred or conferenced with other agents at the same site in the same skill group. Approximately, a total of 4% of calls are transferred and/or conferenced within Clover (Site5).

Table 8 provides agent and estimated BHCA for conference and transfer calls within Clover (Site5).

Table 8 Transfers and Conferences within Site5

Site5	Est. BHCA / Site	Agents / Site
Transfers	96	12
Conferences	96	12

Call Flow #3: Collection Calls (Outbound)

GSF has assigned outsourcer agents at Site8 to handle overflow calls from their partner company, The outbound Collections skill group performs follow-up calls to SS&S customers. The Collections group at Clovis (Site8) has 75 dedicated agents who make outbound calls using the *Collections* campaign.

For Site8, the Cisco Outbound Option (Outbound Option) system places outbound calls with an estimated 4,500 BHCA. Approximately 30% of the total calls placed are successful and will be handled by a group of 75 agents as shown below:

Calls Answered: 1,350 (30% of call volume)

Calls Busy: 1,575 (35% of call volume)

Calls Not Answered: 1,575 (35% of call volume)

Total Calls Dialed: 4,500

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 Clovis (Site8) site, calls are made in the *Predictive Mode*, using agents from the ‘83505 – Collections’ group to make the outbound collection calls.

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 Siren Supplies & Stores immediately at 1-888-555-1212. Thank you.”

Call Flow #4: Outsourced (SS&S) Calls

GSF has assigned outsourcer agents at Site5, Site8, and Site9 to handle overflow calls from their partner company, Siren Supplies & Stores. Customers calling into SS&S are diverted at the carrier network to the GSF locations by dialed number.

Table 9 provides a list of the sites and their internal redirect numbers, estimated BHCA, and agents per site for the outsourced calls.

Table 9 Outsourcer Agents at GSF Site5, Site8 and Site9

Site	Internal Redirect Number	Est. BHCA / Site	Agents / Site
Clover, UT (Site5)	435-232-5211 (Distribution Center and Retail Store Calls)	2,880	160
Clovis, NM (Site8)	575-858-8591 (Distribution Center and Retail Store Calls)	2,700	150
Carson City, NV (Site9)	919-552-3208 (Distribution Center and Retail Store Calls)	2,106	117



Note

Customers do not actually have to dial these *internal* redirect numbers. 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 IP IVR (clusters 1 and 3) and Unified CVP (cluster 2) plays the following series of prompts and messages (of 10 second duration) for the calls coming into the outsourcer sites:

“Thank you for calling Siren Supplies & Stores, your call may be recorded for quality purposes.

For catalog orders, please press 1

For order status, please press 2

For computer technical support, please press 3.”

If the call came in on the:

- Distribution Center Catalog Orders line and an agent is available for that skill group, the call is routed to any agent at any of the two sites who has the ‘x401 – Distribution Center Catalog Orders Skill.’
- Distribution Center Orders Status line and an agent is available for that skill group, the call is routed to any agent at any of the two sites who has the ‘x402 – Distribution Center Orders Status Skill.’
- Retail Center Computer Technical Support line and the agent is available for that skill group, the call is routed to any agent at any of the two sites who has the ‘x408 – Retail Center Computer Technical Support Skill.’

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.

Agents /BHCA to Skill Group Breakdown

For the local-line inbound traffic dealing with redirected outsourced calls, [Table 10](#) lists the BHCA and the number of outsourcer agents available for each of the related skill groups at Clover, Clovis, and Carson City.



Note The BHCA listed in this table is for the outsourcer sites. The numbers listed in this table for Site5 and Site8 does not include any core BHCA or agent information.

Table 10 Agents/BHCA per Skill Group per Outsourcer Site

Site	BHCA/Agents	X01-Cat Orders	X02-Ord Status	X08-Tech Spt	Total
Site5	BHCA	756	846	1,278	2,880
	Agents	42	47	71	160
Site8	BHCA	684	792	1,224	2,700
	Agents	38	44	68	150
Site9	BHCA	486	576	1,044	2,106
	Agents	27	32	58	117

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 11](#) 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 11 Summary of Call Handling and Queueing for Unified Communications Manager Post-Routed and Parent and Child 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.

Table 11 Summary of Call Handling and Queuing for Unified Communications Manager Post-Routed and Parent and Child Call Flow Sites (continued)

Call Flow#	Call Type	Eligible Sites	Call Treatment by System
Call Flow #2	Agent-Initiated Conference/Transfers	Site 5 only	<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	Site8 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. • If answering machine is detected, system leaves message asking customer to call back and terminates call.
Call Flow #4	Outsourced Calls	Local site only	<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.

Parent and Child Test Sites

The following five sites make up the single-site, multisite centralized, and multisite distributed deployment models for testing the parent and child call flow:

- Canton/Site1: [Parent Site](#)
- Clinton/Site4: [Parent Site](#)
- Clover/Site5: [Child Site and Call center](#)
- Clovis/Site8: [Child Site and Call Center](#)
- Carson City/Site9: [Child Site](#)

See [Topology of Parent and Child Sites](#) for a complete map of the five sites, their individual topologies, and the relationship between the sites. See [Table 12](#) for a comprehensive view of the different components deployed at the various Child sites. See [Parent and Child Test Site Definitions](#) for more information on the individual sites and topologies in Test Bed 2.

Site Relationships and Call Routing

Listed below are the relationships of the five sites and the call routing deployed in Test Bed 2.

Multisite Centralized Site Relationships

- Site1 and Site4 are parent sites which *share* Unified ICME components over the WAN.
- Site5, Site8 and Site 9 have their own Unified Communications Manager clusters and operate as independent single site deployments.

Parent Sites:

- Site1 and Site4 are parent sites.
- Both Site1 (Side A) and Site4 (Side B) have the following component configuration for the parent system:
 - Central Controller (Progger) components for parent systems
 - Unified CVP systems that service Unified CVP Post-Routed calls

Child Sites:

- Child sites include Site5, Site8 and Site9. These sites have Unified CCE components, Unified CCGEs and Unified SCCGs in their sites.
 - Site5 has its own duplex Rogger system (Side A and Side B) for built-in redundancy.
 - Site8 has its own duplex Rogger system (Side A and Side B) for built-in redundancy.
 - Site9 has its own duplex Progger (colocated with Unified SCCG) system (Side A and Side B) for built-in redundancy.

Parent and Child Call Routing

The parent systems in Site1/Site4 route calls to the three child systems in Site5, Site8 and Site9. Calls are also routed directly to these child systems. Calls in the parent and child model are routed in one of the following ways:

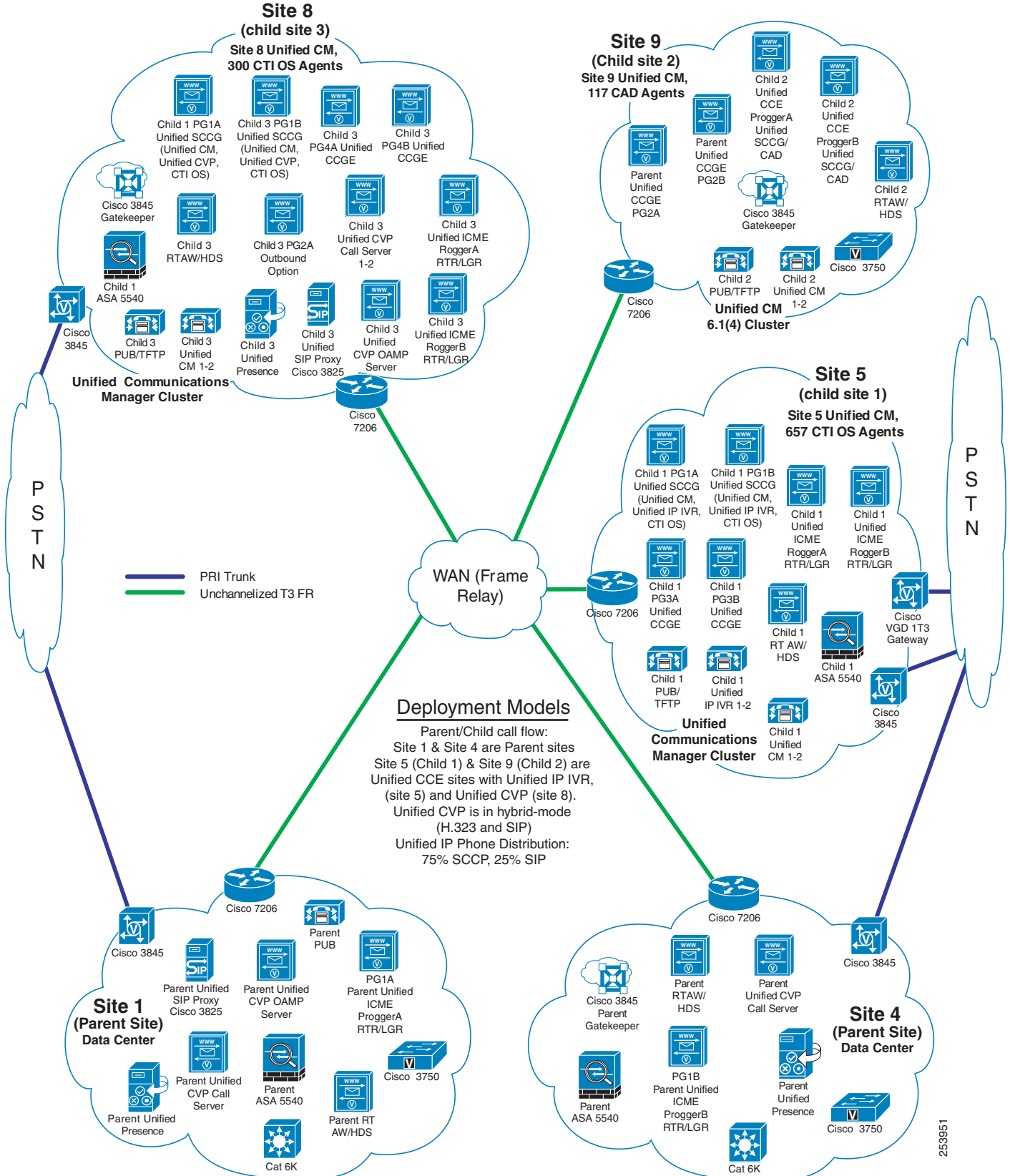
- Calls can be translation-routed from the parent Unified ICME system to either of the three child Unified CCE systems. Each child system is treated as a separate ACD by the parent system. The Unified CVP system at the data centers performs the initial call treatment at the parent site. Site5 and Site9 use Unified IP IVR and Site8 uses Unified CVP to provide queuing capabilities locally at the child sites.
- Site5 and Site8 can route calls incoming to their sites through voice gateways that are not related to the parent system.
- The types of call flows operating in Test Bed 2 include Unified Communications Manager Post-Routed, Unified CVP Post-Routed, Parent and Child and Outbound Option call flows.

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

Topology of Parent and Child Sites

The topology and relationships of the five sites in Test Bed 2 configured in the parent and child model and participating components are shown in [Figure 1](#).

Figure 1 Parent and Child Sites in Test Bed 2



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Snapshot of Parent and Child Sites Components

Table 12 provides a comprehensive view of the different components deployed at the various parent and child sites. For specific component names and quantities, see the individual site descriptions in this section.

Table 12 *Comprehensive Parent and Child Sites Components List*

Components	Site1	Site4	Site5	Site8	Site9
Parent	X	X			
Child			X	X	X
Outsourcer Agents			160	150	117
Outsourcer BHCA			2,880	2,700	2,106
Standalone			X	X	
Standalone Agents			497	75	
Standalone BHCA			9,240	1,350	
Unified Communications Manager Cluster			X	X	X
Music On Hold (MoH)			X	X	X
HW Conference/MTP/Transcoder			X	X	X
Unified ICME Progger	X	X			X
Unified ICME Rogger			X	X	
Unified Intelligence Center	X				
RT AW/HDS	X		X	X	X
Unified Intelligence Center	X				
Unified Contact Center Gateway Enterprise (Unified CCGE)			X	X	X
Unified System Contact Center Gateway (Unified SCCG)			X	X	
Peripheral Gateway (Unified Communications Manager/CTI OS/VRU)			X	X	
Peripheral Gateway (Unified Communications Manager/CAD)					X
Peripheral Gateway (Outbound Dialer)				X	
Access Switch	X	X	X	X	X
Distribution Switch	X	X			
IOS (H.323) Gateway		X		X	
IOS (SIP) Gateway	X		X	X	

Table 12 Comprehensive Parent and Child Sites Components List (continued)

Components	Site1	Site4	Site5	Site8	Site9
PSTN Gateway	X	X	X	X	
VXML Gateway	X	X		X	
Gatekeeper		X		X	X
WAN Router	X	X	X	X	X
Unified Presence	X			X	
Unified SIP Proxy	X			X	
Unified IP IVR			X		X
Unified CVP Call Server	X	X		X	
Unified CVP OAMP Server	X			X	
CAD Agent/Supervisor Desktop					X
CTI OS Agent/Supervisor Desktop			X	X	
DHCP Server (on router)			X	X	X
Unified IP Phones (SCCP and SIP)			X	X	X
Cisco Security Agent	X	X	X	X	X
Cisco ASA 5500 Series Adaptive Security Appliances	X	X	X	X	
Unified Operations Manager	X	X	X	X	X
Third-Party Software	X	X	X	X	X

Parent and Child Test Site Definitions

The following section describes the sites that were created for the various deployment models in Test Bed 2 for testing Parent and Child call flows, Unified Communications Manager Post-Routed, Unified CVP Post-Routed, and Outbound Option call flows. Each topic defines the design characteristics of an individual site and includes a logical topology map and a site equipment table.

Site1: Parent Site

Site Profile

This site participates as the parent, along with Site4, in the parent and child model.

The test site is deployed as follows:

- Agents:
 - There are no agents and ingress calls are not answered at this site.

- Call Flows:
 - Unified CVP at Site1/Site4 (parent sites) is used to provide the initial call treatment (prompting) and queuing for the Unified CVP Post-Routed call flow. Unified IP IVR and Unified CVP can also provide subsequent queuing at the child sites.
 - A Cisco 3845 gateway acts as a SIP gateway into this site and is used to terminate the traffic originating from the PSTN simulators. It also acts as the PSTN and VXML gateways.
- Call Processing/Routing:
 - A PG, Router and Logger (Progger) provides enterprise-wide Unified ICME capability by distributing voice and data from multiple channels to enterprise resources.
 - An Progger (Side A) is located at this hub. There is a dedicated private and separate visible WAN connection to the Progger (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). There is one RT AW/HDS (Side A parent) located at this site.
 - Reporting functionality is provided by Unified Intelligence Center.
 - Both Unified CVP systems provide call treatment and queuing based on the type of post-routed calls coming into Site1.
- Infrastructure:
 - The Peripheral Gateway (PG), which is a VRU PG, provides communications between the Unified CVP and Unified ICME systems.
 - The Cisco 3845 SIP 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.
 - 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 2.
 - Perfmon is installed at this site to provide reporting and troubleshooting information.
- Redundancy and Failover:
 - Failover capabilities are in place in Site4 for Unified CVP.
 - The second Progger 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 Windows-based servers.
 - Cisco ASA 5500 Series Adaptive Security Appliances provides firewall protection, intrusion protection, and policy enforcement capabilities.

Figure 2 shows the logical topology of Site1.

Figure 2 Site1 Logical Topology

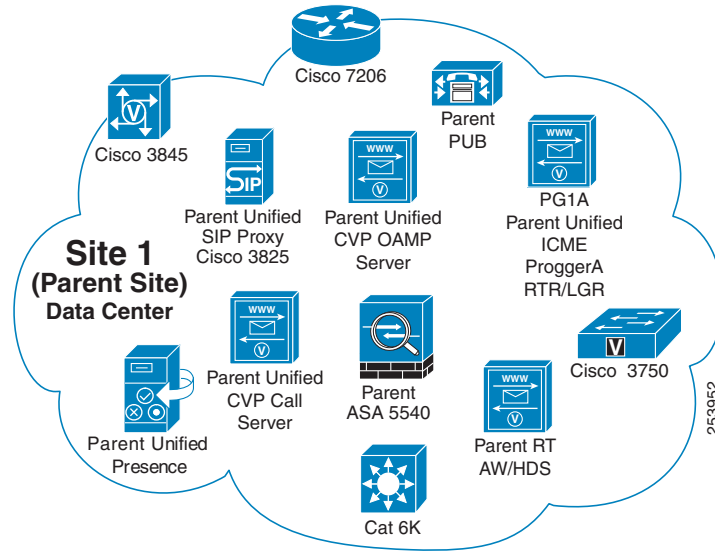


Table 13 lists the equipment, quantity and hardware platforms used in Site1. Use the reference information in the table to access corresponding software versions and model numbers.

Table 13 Site1 Equipment List

Component	Hardware Platform	Quantity
Access Switch	WS-C3750G	1
Cisco Adaptive Security Appliance	Cisco ASA 5540	1
Distribution Switch	WS-C6509	1
PSTN/VXML Gateway (SIP)	CISCO3845	1
Progger	MCS-7845	1
RT AW/HDS	MCS-7845	1
Unified CVP Call Server	MCS-7845	1
Unified CVP OAMP Server	MCS-7845	1
Unified Intelligence Center	MCS-7845	1
Unified SIP Proxy	Proxy module on 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

Site4: Parent Site

Site Profile

This site participates as the backup parent, for Site1, in the parent and child model.

The test site is deployed as follows:

- Agents:
 - There are no agents and ingress calls are not answered at this site.
- Call Flows:
 - Unified CVP at Site1/Site4 (parent sites) is used to provide the initial call treatment (prompting) and queuing for the Unified CVP Post-Routed call flow. Unified IP IVR and Unified CVP can also provide subsequent queuing at the child sites.
 - Cisco 3845 gateway acts as a H.323 gateway into this site and is used to terminate the traffic originating from the PSTN simulators.
- Call Processing/Routing:
 - An Unified ICME Progger (Side B) is located at this hub. There is a dedicated private and separate visible WAN connection to the other Unified ICME Progger (Side A) in Site1.
 - Unified CVP provides call treatment and queuing based on the type of post-routed calls coming into Site4.
- Infrastructure:
 - The Peripheral Gateway, which is a VRU PG, provides communications between the Unified CVP and Unified ICME systems.
 - Two gatekeepers are implemented in GUP cluster models.
 - A WAN router and DS3 link provide connectivity to other sites through a Frame Relay cloud.
 - Windows 2003 Active Directory provides the active directory structure and DNS services.
- Network Management:
 - Perfmon is installed at this site to provide reporting and troubleshooting information.
- Redundancy and Failover:
 - Failover capabilities are in place in Site1 for Unified CVP.
 - Redundancy for the Progger is in place with the Progger (Side A) located in Site1.
 - Gatekeepers are implemented in GUP cluster models.
- 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 3 is a logical topology of Site4.

Figure 3 Site4 Logical Topology

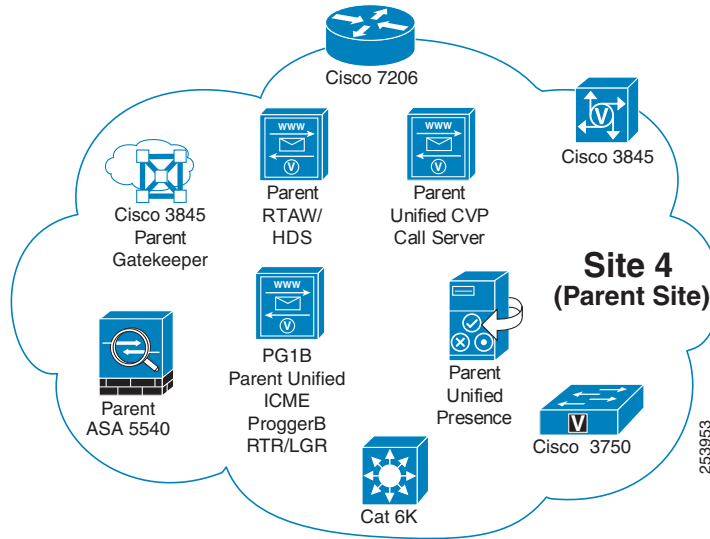


Table 14 lists the equipment, quantity and hardware platforms used in Site4. Use the reference information in the table to access corresponding software versions and model numbers.

Table 14 Site4 Equipment List

Component	Hardware Platform	Quantity
Access Switch	WS-C3750	1
Cisco Adaptive Security Appliance	Cisco ASA 5540	1
Distribution Switch	WS-C6509	1
Gatekeeper (GUP cluster)	Cisco 3845	2
PSTN/VXML Gateway (H.323)	CISCO3845	1
Progger	MCS-7845	1
RT AW/HDS	MCS-7845	1
Unified CVP Call Server	MCS-7845	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

Site5: Child Site and Call center

Site Profile

Site5 is a call center that acts as a child site to the parents site in the parent and child deployment. Site5 also is a single-site deployment participating in the Unified Communications Manager Post-Routed model.

The test site is deployed as follows:

- Agents:
 - 160 agents handle outsourced calls (parent and child calls) with a BHCA of 2,880.
 - 497 agents handle local inbound calls (Unified Communications Manager Post-Routed calls) with a BHCA of 9,240.
 - Agents at this site use CTI OS Agent Desktop Application to handle all calls.
- Call Flows:
 - Unified IP IVR servers at Site5 provide local call treatment, management, and queuing.
- Call Processing/Routing:
 - Child Unified ICME Roggers, each of which contains the Router and Logger on one device, are located at this site.
 - A child RT AW/HDS is located at this site.
- Infrastructure:
 - A small Unified Communications Manager cluster has 1 first node and 2 subsequent nodes.
 - Unified CCGE supports one Peripheral Interface Manager (PIMs) to provide connectivity to the peripherals or child systems at the remote sites.
 - Unified SCCGs are used to communicate with the local Unified Communications Manager cluster, Unified IP IVR, and CTI OS servers.
 - A Cisco 3845 Gateway and the Cisco VGD 1T3 Voice Gateway allow inbound calls to be routed directly to this site from the PSTN.
 - 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:
 - 118 SCCP and 42 SIP phones located at this site are used by agents handling outsourced calls.
 - 220 SCCP and 77 SIP phones located at this site are used by agents handling local inbound calls.
- 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.

- Cisco ASA 5500 Series Adaptive Security Appliances provides firewall protection and policy enforcement capabilities.

Figure 4 shows the logical topology of Site5.

Figure 4 Site5 Logical Topology

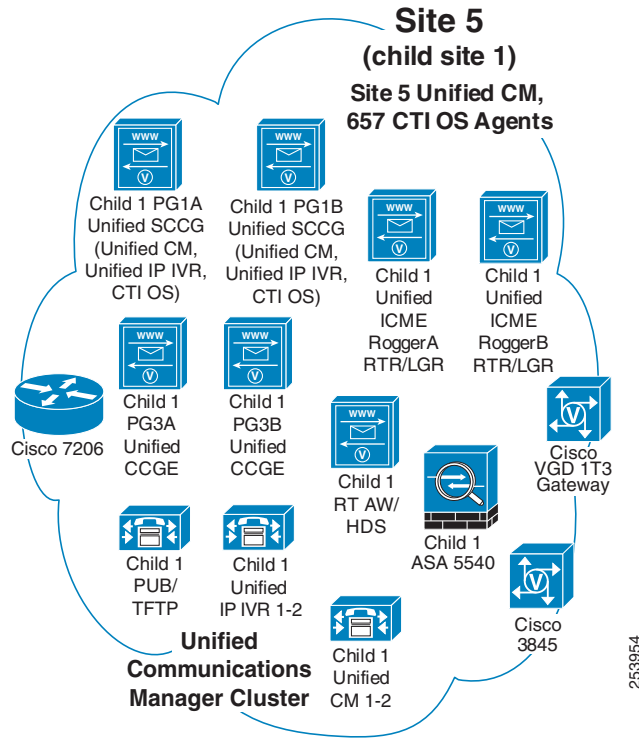


Table 15 lists the equipment, quantity and hardware platforms used in Site5. Use the reference information in the table to access corresponding software versions and model numbers.

Table 15 Site5 Equipment List

Component	Hardware Platform	Quantity
Access Switch	WS-C3750	1
Cisco Adaptive Security Appliance	Cisco ASA 5540	1
CTI OS Agent and Supervisor Desktop	Windows XP and Vista	n/a
Unified CCGE	MCS-7845	2
Unified SCCG (Unified Communications Manager/Unified IP IVR/CTI OS)	MCS-7845	2
PSTN/VXML Gateway (H.323)	CISCO3845	1
PSTN Gateway (Voice)	Cisco VGD-1T3	1
Rogger	MCS-7845	2
RT AW/ HDS (Child)	MCS-7845	2
Unified Communications Manager	MCS-7845	3
Unified IP IVR	MCS-7845/UCS C210	2/1

Table 15 Site5 Equipment List (continued)

Component	Hardware Platform	Quantity
Unified IP Phones	Unified IP Phones (SCCP and SIP) 69xx, 79xx, 89xx, and 99xx Series	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

Site8: Child Site and Call Center

Site Profile

Site8 is a call center that acts as a child site to the parents site in the parent and child deployment. Site8 also is a single-site deployment participating in the Unified CVP Post-Routed model.

The test site is deployed as follows:

- Agents:
 - 150 agents handle outsourced calls (parent and child calls) with a BHCA of 2,700.
 - 75 agents handle outbound calls for credit collection services with a BHCA of 4,500.
 - 75 agents handle local inbound calls (Unified CVP Post-Routed calls) with a BHCA of 1.350.
 - Agents at this site use CTI OS Agent Desktop Application to handle all calls.
- Call Flows:
 - Unified CVP call servers provide local call treatment, management, and queuing.
- Call Processing/Routing:
 - Child Unified ICME Roggers, each of which contains the Router and Logger are located at this site.
 - A child RT AW/HDS is located at this site.
- Infrastructure:
 - A small Unified Communications Manager cluster has 1 first node and 2 subsequent nodes.
 - Unified CCGE supports a Peripheral Interface Manager (PIM) to provide connectivity to the child system at the site.
 - Unified SCCGs are used to communicate with the local Unified Communications Manager cluster, the Unified CVP system, 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:

- 104 SCCP and 46 SIP phones located at this site are used by agents handling outsourced calls.
- 53 SCCP and 22 SIP phones located at this site are used by agents to handle outbound collection calls.
- 47 SCCP and 28 SIP phones located at this site are used by agents handling local inbound calls.
- 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.
 - Cisco ASA 5500 Series Adaptive Security Appliances provides firewall protection and policy enforcement capabilities.

Figure 5 shows the logical topology of Site8.

Figure 5 Site8 Logical Topology

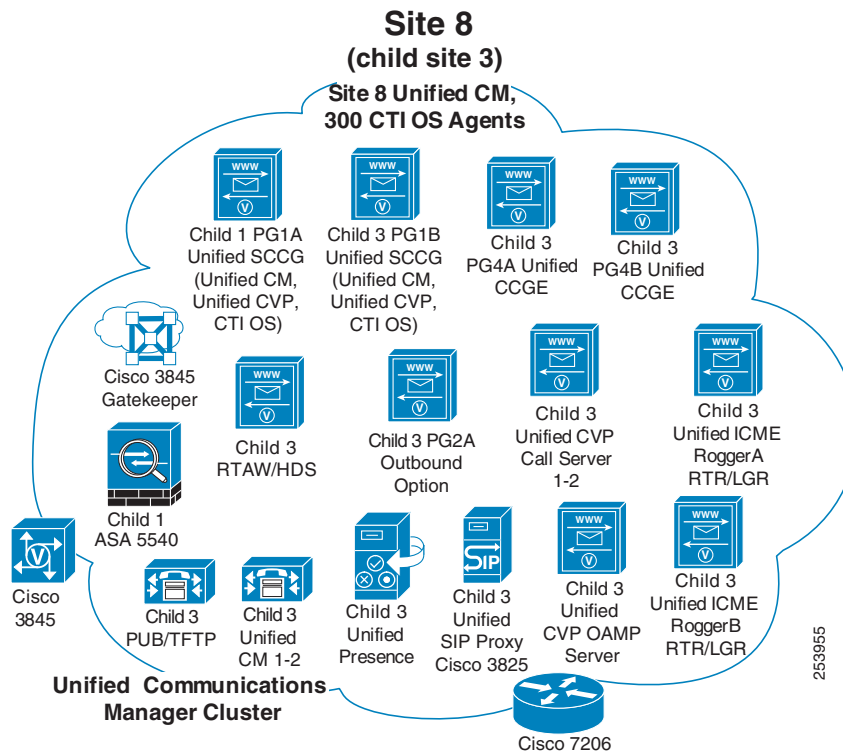


Table 16 lists the equipment, quantity and hardware platforms used in Site8. Use the reference information in the table to access corresponding software versions and model numbers.

Table 16 Site8 Equipment List

Component	Hardware Platform	Quantity
Access Switch	WS-C3750G	1
Cisco Adaptive Security Appliance	Cisco ASA 5540	1
Cisco Agent and Supervisor Desktop	Windows XP and Vista	n/a
PSTN/VXML Gateway (SIP/H.323)	CISCO3845	3

Table 16 Site8 Equipment List (continued)

Unified CCGE	MCS-7845	2
Unified SCCG (Unified Communications Manager/Unified CVP/CTI OS)	MCS-7845	2
Peripheral Gateway (Outbound Dialer)	MCS-7845	1
Rogger (Child)	MCS-7845	2
RT AW/HDS (Child)	MCS-7845	1
Unified Communications Manager	MCS-7845	3
Unified CVP Call Server	MCS-7845	2
Unified CVP OAMP Server	MCS-7825	1
Unified SIP Proxy	Proxy module on CISCO3825	1
Unified IP Phones	Unified IP Phones (SCCP and SIP) 69xx, 79xx, 89xx, and 99xx Series	n/a
WAN Router	Cisco 7206	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

Site9: Child Site

Site Profile

Site9 is a call center that acts as a child site to the parent site in the parent and child deployment.

The test site is deployed as follows:

- Agents:
 - 117 agents use Cisco Agent Desktop (CAD) Application for call control functions.
 - Calls arriving at this site have a BHCA of 2,106.
 - Agents in this site only handle outsourced calls (parent and child calls).
- Call Flows:
 - Call treatment, management, and queuing is provided at the parent site.
- Call Processing/Routing:
 - Child Unified ICME Prognosers, each of which contains the PG, Router, Logger, and CAD on one device, are located at this site.
 - One Child RT AW/HDS is located at this site.
- Infrastructure:
 - A Unified Communications Manager cluster (running a previous version of the software to verify interoperability) has 1 first node and 2 subsequent nodes.

- Unified CCGE supports a Peripheral Interface Manager (PIM) to provide connectivity to the child system at the site.
- Unified SCCGs (colocated on the Progger) are used to communicate with the local Unified Communications Manager cluster, the Unified CCE system, and CAD 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.
- Windows 2003 provides the active directory structure and DNS services.
- Unified IP Phones:
 - 117 SCCP 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 6 shows the logical topology of Site9.

Figure 6 Site9 Logical Topology

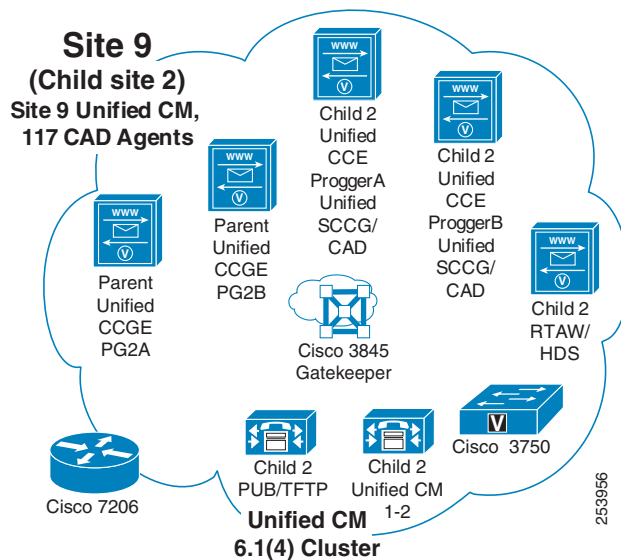


Table 17 lists the equipment, quantity and hardware platforms used in Site9. Use the reference information in the table to access corresponding software versions and model numbers.

Table 17 Site9 Equipment List

Component	Hardware Platform	Quantity
Access Switch	WS-C6506	1
Cisco Agent and Supervisor Desktop	Windows XP and Vista	n/a
Unified CCGE	MCS-7845	2
Progger (with colocated Unified SCCG)	MCS-7845	2
RT AW/HDS	MCS-7845	1

Table 17 **Site9 Equipment List (continued)**

Unified Communications Manager	MCS-7845	3
Unified IP Phones	Unified IP Phones (SCCP) 794x/796x/797x Series	n/a
WAN Router	Cisco 7206	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

