



Test Case Studies

This topic provides a brief overview of Cisco Unified Communications System Release 5.0 and the sample business case studies developed to reflect real-world contact center deployments.

This topic contains the following sections:

- [Introduction](#)
- [Understand Test Objectives](#)
- [Sample Business Case Studies](#)

Introduction

Cisco Unified Communications delivers fully integrated communications by enabling data, voice, and video to be transmitted over a single, unified IP network infrastructure. Cisco Unified Communications validated systems are designed to optimize feature functionality, reduce configuration and maintenance requirements, and provide interoperability with a wide variety of other applications. Cisco Unified Communications provides this capability while maintaining a high level of availability, quality of service (QoS), and security for the enterprise network.

Cisco Unified Communications System includes system testing and validation for the following environments:

- IP telephony (IPT)
- Contact center

In this document, we discuss the testing and verification of only the contact center components of the Cisco Unified Communications System Release 5.0.

Overview of Contact Center

Contact center components are an integral part of Cisco Unified Communications family of products. The contact center functionality delivers intelligent contact routing, call treatment, network-to-desktop computer telephony integration (CTI), and multi-channel contact management over an IP infrastructure to call center agents anywhere in the enterprise.

The Cisco IP network infrastructure also permits rapid deployment of emerging applications such as desktop IP telephony, unified messaging, video telephony, desktop collaboration, and enterprise application integration with IP phone displays.

By combining multi-channel automatic call distributor (ACD) functionality with IP telephony in a unified solution, contact center products help to rapidly deploy a distributed contact center infrastructure.

Contact center software profiles each customer using contact-related data such as dialed number and caller-entered digits (CED) and, simultaneously, monitors the resources at contact center to meet customer needs, including agent skills and availability, queue lengths, expected delay and so on.

This combination of customer and contact center data is processed through user-defined routing scripts that graphically reflect a company's business rules, thus enabling contact center software to route each contact to the optimum resource anywhere in the enterprise.

Contact center software enables companies to deploy a complete network-to-desktop CTI strategy, including comprehensive capability at the agent's workstation. A contact center system delivers a uniquely rich set of data to business applications, providing enterprise-wide call-event and customer-profile information to a targeted agent's desktop.

Understand Test Objectives

The intent of conducting system-wide testing is to define and validate the seamless interoperability and stability of components that comprise a complete and optimized Cisco Unified Communications system.

Cisco has done this by designing, installing, configuring, and testing contact center hardware and software that work together in a predictable, effective, and reliable manner.

Cisco has created two fictitious business case studies and has defined real-world business requirements that exercise specific features and functions of the contact center set of products. The first case study represents a financial firm with distributed call centers, including outsourcer call centers. The second is a large distribution and retail company that supports retail call center operations for its customers.

The business requirements were used to design and configure two test beds with sites that reflect these sample business models. The sites were installed with contact center components for testing and verification of the systems designed for these business models.

The testing focuses in varying degrees on performance and behavior issues such as:

- End-to-end functionality
- Interoperability
- Reliability
- Redundancy
- Stability
- Upgradeability
- Stress
- Load

Sample Business Case Studies

Two sample case studies with business requirements were defined to design contact center call flows, and the software and hardware topologies that would support these call flows.

- Financial Business Case Study— Cisco Unified CallManager (Unified CallManager) Post-Routed call flow
- Retail Business Case Study—Cisco Unified Customer Voice Portal (Unified CVP) Post-Routed call flow

**Note**

While these case studies are based on (and derived from) financial and retail industries, the information discussed here can be applicable to other industries, such as health care, manufacturing, and so on.

Deployment models, site configurations, and complex scripting for the call flows were developed from the business requirements.

Deployment models and test sites for both business models are described in detail in [Chapter 2, “Test Deployment Models and Sites”](#).

[Chapter 4, “Tested Call Flows”](#) discusses the specifics of testing call flows and the configuration tasks required to set up these call flows.

This topic has the following sections:

- [Financial Business Case Study](#)
- [Retail Business Case Study](#)

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 CallManager Post-Routed call flow testing.

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

**Note**

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

Table 1-1 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: 973
Chicago, IL [call center and remote of Site1/Site4]	Site2	5055	334	
Clifton, TX [call center and remote of Site1/Site4]	Site3	9258	642	
Clinton, MO [backup multi-site hub/data center]	Site4	n/a	no agents	
Clover, UT [small data center and call center]	Site5	1989	117	Cluster 2: 277
Carefree, AZ [call center and remote of Site5]	Site6	5122	160	
At Home/Telecommuter [associated with Site2]	Site8	n/a	1	part of same cluster as Site2
Carson City, NV [small data center and call center]	Site9	2047	117	Cluster 3: 117

**Note**

A teleworker (remote agent) located at Site8, who is associated with Site2, handles calls coming into Site1 and Site4 based on the skill group assignment.

Outsourced Call Center Services

However, over the years, GSF has noted a decline in call volumes at the call centers as more customers start using 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).

Table 1-2 lists Site2, Site3 and Site9, which have been set up as *outsourcer* sites for offering call center services on a contract basis.

Table 1-2 Number of Outsourcer Agents at Sites (Site2, Site3, and Site9)

Site Name	Site	Number of Outsourcer Agents	Outsourcer BHCA
Chicago, IL	Site2	33	561
Clifton, TX	Site3	45	765
Carson City, NV	Site9	117	2,047
Total		195	3,373

SS&S has modified their carrier-based routing plans to divert calls to these agent groups/locations by dialed number automatically, without consulting the SS&S contact center system first.

Calls for these outsourcer agents are routed directly to the GSF data centers locations at Site1 and Site4, with a 50/50 split between the two sites.

GSF has set up specific agent groups for the outsourcer agents at Site2, Site3, and Site9.

At Site2 and Site3, GSF also has other agents who receive GSF customer calls directly. There is no blending of these *core* GSF agents with the outsourcer agents at these sites.

Site9 has no GSF agents. All agents at this site are outsourcer agents that service only SS&S customers.

Administrative Phones

Additionally, at each site, there are a number of *administrative* phones in conference rooms, break rooms, and manager offices. These phones generate a minimal amount of call volume, but need to be represented in the test environment to model “real” call center operations.

Table 1-3 lists the number of administrative phones and the BHCA for the administrative phones per site.

Table 1-3 Number of Administrative Phones/BHCA

Site Name	Site	Number of Admin Phones	BHCA for Admin Phones
Canton, KS [multi-site hub/data center]	Site1	50	125
Chicago, IL [call center and remote of Site1]	Site2	16	40
Clifton, TX [call center and remote of Site1]	Site3	29	72
Clinton, MO [multi-site hub/data center]	Site4	45	113
Clover, UT [small data center and call center]	Site5	5	12
Carefree, AZ (Site6) [call center and remote of Site5]	Site6	6	15
Carson City, NV [small data center and call center]	Site9	5	12
Total		61	151

As with any typical telephony implementation, a standard amount of conferences and transfers are performed using the administrative phones within the same site. To model the traffic appropriately, total transfers and conferences are estimated at 5% of the total BHCA for the administrative phones.

Services and Skill Groups

Table 1-4 lists the services that the agents at the call centers provide to the customers of GSF.

Table 1-4 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)

Table 1-4 Services, Activities, and Locations (continued)

Skill #	Service	Activity	Locations
04	Member Banking	Internet Banking Service for customers	All locations, except Carson City (Site9)
05	Customer Collections	Credit Card collections and account services	Only Carefree (Site6) (has a group of dedicated agents for outbound calls)

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.



Note

Site8 is set up as a Unified MA site to function like Site2 and handle calls that are routed to Site2.

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 (Site6) perform only outbound collection calls on their customer credit card accounts.

Chicago, Clifton, and Carson City Agents

A separate group of agents at the Chicago (Site2) and Clifton (Site3) locations are set up as outsourcer agents to handle calls from and provide services to SS&S customers.

Agents at Carson City (Site9) are set up exclusively as outsourcer agents and do not take any calls from GSF customers, only from its partner company, SS&S. Agents at this site also use CAD Applications for call control functions.

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.



Note

Canton (Site1) and Clinton (Site4) are data centers, and therefore, do not have any agents.

Chicago, IL (Site2)

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

- Has 334 agents who use CTI OS Desktop Application
- Handles Unified CallManager Post-Routed calls
- Uses Customer Response Solutions (CRS) in Site1/Site4 for call treatment and queuing
- Uses Unified CallManager cluster in Site1/Site4 for call processing
- Operates as a call center for both GSF and SS&S customers

Table 1-5 lists the skill sets of the agents at the Chicago site (total BHCA: 5,616) and the agent to BHCA numbers.

Table 1-5 Agent Profile for Chicago (Site2)

Call Flow	Skill Group and Service	Number of Agents	BHCA
Call Flow #1a	#21101 – Account Inquiry	91	1,365
Call Flow #1b	#21202 – Literature Request	30	450
Call Flow #1d	#21404 – Member Banking	151	2,718
Call Flow #2a	#22101 – Transfers/Conferences from Clifton (Site3)	29	522
Call Flow #4a (outsourced calls)	#2401 – Distribution Center Catalog Orders (outsourcer agents only)	12	204
Call Flow #4b (outsourced calls)	#2402 – Distribution Center Order Status (outsourcer agents only)	7	119
Call Flow #4c (outsourced calls)	#2408 – Retail Center Technical Support (outsourcer agents only)	14	238

Clifton, TX (Site3)

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

- Has 642 agents who use CTI OS Desktop Application
- Handles Unified CallManager Post-Routed calls
- Uses CRS in Site1/Site4 for call treatment and queuing
- Uses Unified CallManager cluster in Site1/Site4 for call processing
- Operates as a call center for both GSF and SS&S customers

Table 1-6 lists the skill sets of the agents at the Clifton site (total BHCA: 10,023) and the agent to BHCA numbers.

Table 1-6 Agent Profile for Clifton (Site3)

Call Flow	Skills and Services	Number of Agents	BHCA
Call Flow #1a	#31101 – Account Inquiry	145	2,175
Call Flow #1b	#31202 – Literature Request	87	1,305
Call Flow #1d	#31404 – Member Banking	350	5,508
Call Flow #2a	#32101 – Transfers/Conferences from Chicago (Site2)	15	270
Call Flow #4a (outsourced calls)	#3401 – Distribution Center Catalog Orders (outsourcer agents only)	10	170
Call Flow #4b (outsourced calls)	#3402 – Distribution Center Order Status (outsourcer agents only)	15	255
Call Flow #4c (outsourced calls)	#3408 – Retail Center Technical Support (outsourcer agents only)	20	340

Clover, UT (Site5)

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

- Has 117 agents who use CAD Desktop Application
- Handles Unified CallManager Post-Routed calls
- Has its own CRS for call treatment and queueing
- Has its own Unified CallManager cluster for call processing
- Operates as a data center and a call center for GSF customers only

Table 1-7 lists the skill sets of the agents at the Clover site (total BHCA: 1,989) and the agent to BHCA numbers.

Table 1-7 Agent Profile for Clover (Site5)

Call Flow	Skills and Services	Number of Agents	BHCA
Call Flow #1a	#51101 – Account Inquiry	33	495
Call Flow #1b	#51202 – Literature Request	6	90
Call Flow #1d	#51404 – Member Banking	72	1,296
Call Flow #2a	#52101 – Transfers/Conferences from Carefree (Site6)	6	108

Carefree, AZ (Site6)

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

- Has a total of 160 agents who use CAD Desktop Application
- Has 108 agents who place outbound calls to customers for collection services
- Handles Unified CallManager Post-Routed calls
- Uses CRS in Site5 for call treatment and queuing
- Uses the Unified CallManager cluster in Clover (Site5) for call processing
- Operates as a call center for both inbound and outbound 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: 1,300 (30% of call volume)

Calls Busy: 1,519 (35% of call volume)

Calls Not Answered: 1,519 (35% of call volume)

Total Calls Dialed: 4,338

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.”

Table 1-8 lists the skill sets of the agents at the Carefree site (total BHCA: 5,202) and the agent to BHCA numbers.

Table 1-8 Agent Profile for Carefree (Site6)

Site	Skills and Services	Number of Agents	BHCA
Call Flow #1a	#61101 – Account Inquiry	23	345
Call Flow #1b	#61202 – Literature Request	1	15
Call Flow #1d	#61404 – Member Banking	18	324
Call Flow #2a	#62201 – Transfers from Clover (Site5)	10	180
Call Flow #3a – Customer Collection	#63101 – Collections	108	4338

Remote Agent (Site8)

A remote agent is located in Site8. Essentially, Site8 can be considered an extension of the call center at Site2 and provides support to GSF customers based on the skill group assignment.

Carson City, NV (Site9)

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

- Has 117 agents who use CAD Desktop Application
- Handles Unified CallManager Post-Routed calls
- Has its own CRS for call treatment and queueing
- Has its own Unified CallManager cluster for call processing
- Operates as a call center for SS&S customers only

Table 1-9 lists the skill sets of the agents at the Carson City site (total BHCA: 2,047) and the agent to BHCA numbers.

Table 1-9 Agent Profile for Carson City (Site9)

Site	Skills and Services	Number of Agents	BHCA
Call Flow #4a (outsourced calls)	#9401 – Distribution Center Catalog Orders (outsourcer agents only)	27	459
Call Flow #4b (outsourced calls)	#9402 – Distribution Center Order Status (outsourcer agents only)	32	544
Call Flow #4c (outsourced calls)	#9408 – Retail Center Technical Support (outsourcer agents only)	58	1,044

Sample Cisco Unified CallManager Post-Routed Call Flows

The 4 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 #2a—Conference/Transfer to Another Skill Group
- **Call Flow #3a: 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 CallManager clusters at the sites handling the call flows are set up as follows:

- Unified CallManager Cluster #1:
 - Unified CallManager cluster (CoW) at Site1/Site4

- Agents are at Site2, Site3, and Site8

Traffic between Site1/Site4 and Site2, Site3, and Site8 (in Cluster 1) is considered *intra-cluster* or occurring within their *home* cluster.

- Unified CallManager Cluster #2:

- Unified CallManager 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 CallManager Cluster #3:

- Unified CallManager cluster at Site9
- Agents are at Site9

Traffic between Site1/Site4 and Site5 (occurring between Cluster 1 and Cluster 2) is considered *inter-cluster* or crossing between clusters.

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 this site either, then the call is sent to agents at Site2, Site3, or Site8.

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 Queuing](#) 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 CallManager clusters at the sites handling the Unified CallManager Post-Routed call flow are set up as follows:

- Unified CallManager Cluster #1: Agents at Site2, Site3 and Site8
- Unified CallManager Cluster #2: Agents at Site5 and Site6

[Table 1-10](#) provides a list of the sites and their local access numbers, estimated BHCA, and agents per site for General Information Requests lines.

Table 1-10 General Information Request Local Lines

Site	Local Number	Est. BHCA / Site	Agents / Site
Chicago, IL (Site2)	800-212-4635 (INFO)	4,533	272 (plus 1 Unified MA at Site8)
Clifton, TX (Site3)	800-352-4635 (INFO)	8,988	538
Clover, UT (Site5)	800-233-4636 (INFO)	1881	117
Carefree, AZ (Site6)	800-321-4636 (INFO)	684	160 (108 are dedicated agents for outbound calls)

**Note**

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

Call Flow Logic

The CRS 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, 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 (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. 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.

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 1-11](#) lists the BHCA and the number of agents available for each of the related skill groups at Chicago, Clifton, Clover, and Carefree.



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 outsourced information.

Table 1-11 Agents/BHCA per Skill Group per Site

Site	BHCA/Agents	X1001-Acct	X1002-Lit	X1004-Bank	Collections	Total
Site2	BHCA	1,365	450	2,718	n/a	4,533
	Agents	91	30	151		272
Site3	BHCA	2,175	1,305	5,508	n/a	8,988
	Agents	145	87	306		538
Site5	BHCA	495	90	1,296	n/a	1,989
	Agents	33	6	72		117
Site6	BHCA	345	15	324	4338	5,202
	Agents	23	1	18	108	160

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 2.5% of all calls terminating with them using a post-route that they have initiated. Additionally, another 2.5% 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 the agent from the second skill group, instead of doing a *blind* transfer

Typically, calls conference/transfer between agent groups are designated to the same service or Unified CallManager cluster. For instance, Chicago (Site2) calls that transfer or conference typically only go to Clifton (Site3) as intra-cluster traffic. In the same manner, Clover (Site5) calls only go to Carefree (Site6).

Approximately, a total of 5% of calls are transferred and/or conferenced from Chicago (Site2) to Clifton (Site3) and from Clover (Site5) to Carefree (Site6).

Call Flow #2a – Conference/Transfer to Another Skill Group

When callers mistakenly select wrong menu choices or dial wrong numbers, the agent taking the call may need to re-direct the caller to a different agent in a specific skill group to handle their request.

Rather than asking the customer to call back, GSF wants the agents to re-qualify calls using the same routing logic that would have been used if the caller had made the correct choice initially.

Agents at all the sites use the Cisco Unified Intelligent Contact Management (Unified ICM) Dialed Number Plan and CTI OS/CAD Desktop Applications for re-routing calls to another agent group.

Calls from Call Flow #1 are the most likely to require re-direction to a different site because of caller or system error. Other call types are handled on an exception basis.

The dial plan handling this type of a call initiates the transfer/conference to a local group first before considering agents at other sites within the same cluster or a different cluster. If no agents are available, the call is queued at the CRS in the home cluster for an agent in the new group, but at a higher priority, as the caller may already have waited in queue for an agent, prior to the transfer.

Call Handling and Queueing

An example of this type of transfer is as follows:

1. A caller presses 1 accidentally when really wanting to press 3. The caller is routed to the Account Inquiry group instead of the Member Banking group at Chicago (Site2).
2. The caller explains the service required to the Account Inquiry agent who takes the call.
3. The agent realizes that customer has made the wrong selection and a transfer is required to route the caller to the Member Banking group.
4. The agent uses the system transfer numbers listed in [Table 1-12](#) to transfer the call to the correct agent group.

Table 1-12 System Transfer Numbers

To move a call to the ... group	Use Conference/Transfer and press...
Account Inquiry	4001
Literature Request	4002
Member Banking	4004
Brokerage Service	4007



Note

Not all sites use a four-digit dial plan as shown in the example above. For those contact centers that use longer dialing plans, use the appropriate number plan.

5. If dealing with a VIP customer, the agent can *conference* to stay on the line with the customer and introduce the customer to the new (Member Banking) agent. This is a *consultative transfer*.
6. The system then searches for Member Banking agents as follows:
 - If an agent from this group is not available at Chicago (Site2), the system considers agents at other sites in the intra-cluster grouping, that is, at Clifton (Site3).
 - If no agents are available in that skill group at the other location, the system will search for available agents in the inter-cluster sites (Site6).

- If no agents are available at any of the sites, the system queues the call at the current location for an agent in the local site (Site2).

Once the call is queued, the system plays an announcement telling the caller the number of calls already in queue for this service (using a real-time message).



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 #3a: Collection Calls (Outbound)

The outbound Collections skill group performs follow-up calls to GSF customers. The Collections group at Carefree (Site6) has 108 dedicated agents who make outbound calls using the *Collections* campaign.

A group of 108 agents make an estimated 1300 BHCA outbound calls. The number refers to the number of successful calls, which is estimated at 30% of the total calls placed by the Cisco Unified Outbound Dialer (Unified OUTD) as shown below:

Calls Answered: 1,300 (30% of call volume)

Calls Busy: 1,519 (35% of call volume)

Calls Not Answered: 1,519 (35% of call volume)

Total Calls Dialed: 4,338

Call Handling and Queuing

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.

If the customer asks the agent to call back later, the agent can set up the system in one of two ways:

- Use the *personal callback* feature, to call the customer back at a scheduled time.
- Use the *system callback* feature, to have the system call the customer back at a scheduled time and connect the customer with any available agent in the Collections group.

At the Carefree (Site6) site, calls are made in the *Predictive Mode*, using agents from the '63101 – 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 (SS&S) Calls

GSF has assigned outsourcer agents at Site2, Site3 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 1-13 Outsourcer Agents at GSF Site2, Site3 and Site9

Site	Internal Redirect Number	Est. BHCA / Site	Agents / Site
Chicago, IL (Site2)	919-232-5211 (Distribution Center Catalog Orders)	561	33
Clifton, TX (Site3)	919-232-5212 (Distribution Center Orders Status)	765	45
Carson City, NV (Site9)	919-552-3208 (Retail Center Computer Technical Support)	2,047	117

**Note**

Customers do not actually have to dial these *internal* redirect numbers. The carrier routes these calls on a percent allocation basis. The carrier splits them (50%/50%), for load-balancing purposes, between the two GSF data center locations (Site1 and Site4).

Call Flow Logic

The CRS plays the following series of prompts and messages (of 10 second duration) for the calls coming into the outsourcer GSF sites:

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

If the call came in on the:

- Distribution Center Catalog Orders line (919-232-5211) and an agent is available for that skill group, the call is routed to any agent at any of the 3 sites who has the ‘x401 – Distribution Center Catalog Orders Skill.’
- Distribution Center Orders Status line (919-232-5212) and an agent is available for that skill group, the call is routed to any agent at any of the 3 sites who has the ‘x402 – Distribution Center Orders Status Skill.’
- Retail Center Computer Technical Support line (919-552-3208) and the agent is available for that skill group, the call is routed to any agent at any of the 3 sites who has the ‘x408 – Retail Center Computer Technical Support Skill.’

If agents are not available at any location, the call is held in queue for the next available 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 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, etc.

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 re-directed outsourced calls, [Table 1-14](#) lists the BHCA and the number of outsourcer agents available for each of the related skill groups at Chicago, Clifton, and Carson City.



Note

The BHCA listed in this table is for each of the outsourcer sites. The numbers listed in this table for the different sites do not include any core BHCA or agent information.

Table 1-14 Agents/BHCA per Skill Group per Outsourcer Site

Site	BHCA/Agents	X01-Cat Orders	X02-Ord Status	X08-Tech Spt	Total
Site2	BHCA	204	119	238	561
	Agents	12	7	14	33
Site3	BHCA	170	255	340	765
	Agents	10	15	20	45
Site9	BHCA	459	544	1,044	2,047
	Agents	27	32	58	117

Emergencies and Special Situations

If a site has to be closed for an emergency, for instance, a bomb threat, a special site emergency skill group is defined with a specific agent associated with it. All the standard call flows check to make sure the emergency agent has not logged into the emergency skill group, before attempting to process the call for that site.

- If a site is closed in an *emergency close* situation, all calls ignore the local agents for that closed site and consider only agents from other sites, provided they are also not closed for the same reason. If all sites are in emergency close mode, the system acts as if the company is closed or outside of normal calling hours.

Calls queued for a site that is in emergency close will be re-qualified to select another site for the queue.

- If a site is not closed and is scheduled to be open, but the agents are unable to log in for some reason (snow storm, black-out, etc.), the system does not accept calls into the queues for that site and treats the site as if it was closed.
- If a site is closed due to a national holiday, customers' calls into the contact centers are treated similar to the *outside of normal calling hours* closure and a message informs the caller that the company is closed for the holiday.

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 1-15 summarizes this information and lists the different types of sample Unified CallManager Post-Routed call flows discussed previously, the sites that are eligible to handle them, and their treatment by the contact center system.

Table 1-15 Summary of Call Handling and Queueing for Unified CallManager 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. • If more than 20 calls in queue, plays message to call back. • 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 #2a	Conf/Transfer to Another Skill Group	Local site first, then within “home” cluster, and then within clustered groupings	<ul style="list-style-type: none"> • Checks for and transfers to local agents who can immediately take the call. • If agent is unavailable locally, places in queue with higher priority and examines agent availability on other sites. • While calls are in queue, announcement notifies caller of position in queue.
Call Flow #3a	Outbound Collection	Only Site6 handles outbound calls	<ul style="list-style-type: none"> • Uses predictive Unified OUTD. • If called party answers, connects call to agent. • If called party does not answer, does not try the call again within campaign time. • If called party asks agent to call back, uses personal callback or system callback features to call customer back at scheduled time. • If answering machine is detected, system leaves message asking customer to call back and terminates call.
Call Flow #4	Outsourced Calls from SS&S	Local site only (Site2, Site3, and Site9)	<ul style="list-style-type: none"> • Queues locally until agent is available. • Does not permit crossing to other sites, even within the same cluster. • If more than 20 calls in queue, plays message to call back. • Caller must terminate call by hanging up.

Table 1-15 Summary of Call Handling and Queuing for Unified CallManager Post-Routed Call Flow Sites (continued)

Call Flow#	Call Type	Eligible Sites	Call Treatment by System
Special Calls	Shutdown due to Emergency, Bad Weather, or Holiday	All sites	<ul style="list-style-type: none"> • If the site is closed, does not consider the site for calls. • If call is queued at closed site, reroutes to an open site. • If all sites are closed, does not accept calls into queues, and plays <i>site closed</i> message.

Retail Business Case Study

This section describes the business profile and requirements of the sample retail business, Siren Supplies and Stores (SS&S), a large distribution and retail operations company. SS&S plans to deploy Cisco Unified Communications family of products to replace aging equipment in distribution branch offices and retail centers nation-wide.

The SS&S business operations is set up as follows in the locations listed below:

- Data Centers—Two (2) data centers support the call centers and agents in the Distribution/Branch Office and Retail Centers. There are no agents located at the data centers.
- Distribution Center/Branch Office—One (1) central distribution call center supports *Business-to-Business* or *B2B* operations and provides national coverage for customers of SS&S.
- Retail Centers—Three (3) retail *super center* support consumer retail operations for three major outlet locations. Each of the locations has call center agents assigned to specific skill groups within the center, based on their areas of product knowledge. Customers can call into the centers and speak to agents directly or use kiosks at various locations in the region.



Note

In the North-Central Retail Center (Site7), a small Unified CallManager cluster with 15 agents handles specific conference/transfers from the Mid-Atlantic Retail Center (Site6) and South-Central Retail Center (Site8) locations (with an approximate BHCA of 270). In the Mid-Atlantic Retail Center (Site6), a small group of 73 dedicated agents in the Retail Credit Account Collections skill group handle outbound collections calls.

Call Centers or Sites

The site names have been mapped to specific site numbers. These sites participate in the Unified CVP Post-Routed call flows testing.

Table 1-16 lists the various SS&S office sites, number of agents, and Unified CallManager clusters at each site, and the Busy Hour Call Attempt (BHCA) at each of the six sites.



Note

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

Table 1-16 Office Locations and Agents

Site Name	Site	BHCA	Agents	Unified CallManager Clusters
Chicago Data Center/Hub	Site1	n/a	no agents	X
Central Branch Office	Site3	7942	500	X
Dallas Data Center/Hub	Site5	n/a	no agents	X
Mid-Atlantic Retail Center	Site6	14,689	683 (73 dedicated agents for handling outbound retail credit calls)	
North-Central Retail Center	Site7	4935	291 (15 dedicated agents for handling conference/transfers from Site6 and Site8)	X
South-Central Retail Center	Site8	9062	537	

Administrative Phones

Additionally, at each site, there are a number of administrative phones in conference rooms, break rooms, and manager offices. These phones generate a minimal amount of call volume, but need to be represented in the contact center environment to model “real” call center operations.

Table 1-17 lists the number of administrative phones and the Busy Hour Call Attempt (BHCA) for the administrative phones per site.

Table 1-17 Number of Administrative Phones/BHCA

Site Name	Site	Number of Admin Phones	BHCA for Admin Phones
Chicago [multi-site hub/data center]	Site1	20	50
Central Distribution Office [distribution center/small hub and remote site]	Site3	25	62
Dallas [multi-site hub/data center]	Site5	30	75
Mid-Atlantic Retail Center [retail store and remote site]	Site6	34	85
North-Central Retail Center [retail store/small hub and remote site]	Site7	14	35
South-Central Retail Center [retail store and remote site]	Site8	26	65

As with any typical Telephony implementation, a standard amount of conferences and transfers are performed using the administrative phones within the same site. To model the traffic appropriately, conferences and transfers are estimated at 5% of the total BHCA for the administrative phones.

Services and Skill Groups

Table 1-18 lists the services that the agents at the distribution centers and the retail centers provide to the customers of SS&S.

Table 1-18 Services, Activities, and Locations

Location	Skill #	Service	Activity	Locations
Dist Center	01	Catalog Orders	Take new orders from the SS&S Catalog	Distribution Center (Site3)
Dist Center	02	Order Status	Answer inquiries on prior catalog orders	Distribution Center (Site3)
Dist Center	03	Specialty Items	Take orders and handle inquiries on special items not available in all states	Distribution Center (Site3)
Retail Center	04	Retail Credit Account Collections	Retail Credit account collections	Mid-Atlantic Retail Center only (blended inbound and outbound) (Site6)
Retail Center	05	Electronics & Personal Computers	Sales specialists trained in the SS&S Consumer Electronics (TV, VCR, etc.)	All Retail Locations
Retail Center	06	Major Appliances	Sales specialists trained in the SS&S Major Appliances lines	All Retail Locations
Retail Center	07	Music and Movies	Sales specialists trained in the SS&S CD/ DVD/ VCR music and movies	All Retail Locations
Retail Center	08	Computer Technical Support	Specialists trained to help SS&S customers requiring assistance setting up or using computers and electronics	All Retail Locations



Note The Speciality Items skill group in the Distribution Center (Site3) handles specific products that require additional mentoring and training. At these sites, supervisors require access to the *silent monitor*, *barge-in*, and *intercept* features and also the ability to record agent phone calls for quality assurance purposes.

Cross-Trained Agents

SS&S has cross-trained the majority of their agents at the various call center sites to provide a variety of account services to customers.



Note There are no agents handling calls at Chicago (Site1) and Dallas (Site5); these are data centers.

SS&S offers retail call center operations for its customers such as catalog and specialty item sales, retail centers with major appliances and electronics, and computer technical support.

Distribution Center Agents

The Distribution Center (Site3) is set up to handle the above customer calls and services. This site uses the Cisco Agent Desktop (CAD) to handle call control functions.

Retail Center Agents

The agents in the retail centers in the Mid-Atlantic Retail Center (Site6), North-Central Retail Center (Site7), and South-Central Retail Center (Site8) locations are also set up to handle similar calls, but use CTI OS Desktop Applications for call control functions.

Dedicated agents in the Mid-Atlantic Retail Center (Site6) perform outbound collection calls on their customer credit card accounts.

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.



Note

Chicago (Site1) and Dallas (Site5) are data centers, and therefore, do not have any agents.

Distribution Center (Site3)

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

- Has 500 agents who use CAD Desktop Application
- Handles Unified CVP Post-Routed calls
- Uses Unified CVP in Site1/Site5 for call treatment and queueing
- Has its own Unified CallManager cluster for call processing
- Operates as a small data center and call center

Table 1-19 lists the skill sets of the agents at the Distribution Center (total BHCA: 7,942) and the agent to BHCA numbers.

Table 1-19 Agent Profile for Distribution Center (Site3)

Call Flow	Skills and Services	Number of Agents	BHCA
Call Flow #1a	#301 – Catalog Orders	308	5,544
Call Flow #1a	#302 – Order Status	47	658
Call Flow #1a	#303 – Specialty Items	145	1,740

Mid-Atlantic Retail Center (Site6)

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

- Has 683 agents who use CTI OS Desktop Application
- Has 73 dedicated agents who handle outbound calls
- Handles Unified CVP Post-Routed calls
- Uses Unified CVP in Site1/Site5 for call treatment and queuing
- Uses Unified CallManager cluster in Site1/Site5 for call processing
- Operates as a call center
- Outbound agents at this site do not receive transfers or conferences from other sites.

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

Calls Answered: 1,314 (30% of call volume)

Calls Busy: 1,533 (35% of call volume)

Calls Not Answered: 1,533 (35% of call volume)

Total Calls Dialed: 4,380

[Table 1-20](#) lists the skill sets of the agents at the Mid-Atlantic Retail Center (total BHCA: 14,689) and the agent to BHCA numbers.

Table 1-20 Agent Profile for Mid-Atlantic Retail Center (Site6)

Site	Skills and Services	Number of Agents	BHCA
Call Flow #3	#604 – Retail Credit Account Collections	73	4380
Call Flow #2a	#605 – Electronics & Personal Computers	183	2,928
Call Flow #2a	#606 – Major Appliances	122	1,952
Call Flow #2a	#607 – Music and Movies	61	1,037
Call Flow #2a	#608 – Computer Technical Support	244	4,392

North-Central Retail Center (Site7)

The following is a brief summary of Site7-relevant information:

- Has 291 agents who use CTI OS Desktop Application
- Handles Unified CVP Post-Routed calls
- Uses Unified CVP in Site1/Site5 for call treatment and queuing
- Uses its own Unified CallManager cluster for call conference/transfers
- Uses the Unified CallManager cluster in Site1/Site5 for call processing
- Operates as a call center

[Table 1-21](#) lists the skill sets of the agents at the North-Central Retail Center (total BHCA: 4,935) and the agent to BHCA numbers.

Table 1-21 Agent Profile for North-Central Retail Center (Site7)

Site	Skills and Services	Number of Agents	BHCA
Call Flow #2a	#705 – Electronics & Personal Computers	97	1,552
Call Flow #2a	#706 – Major Appliances	41	656
Call Flow #2a	#707– Music and Movies	27	459
Call Flow #2a	#708 – Computer Technical Support	111	1,998
Call Flow #2b	#7081 – Conferences/Transfers from Site6	8	144
Call Flow #2b	#7082 – Conferences/Transfers from Site8	7	126

**Note**

Skill groups 7081 and 7082 are hosted locally on the small Unified CallManager cluster to support specific conference and transfers from Site6 and Site8 with 15 agents and an estimated BHCA of 270 calls per busy hour.

South-Central Retail Center (Site8)

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

- Has 537 agents who use CTI OS Desktop Application
- Handles Unified CVP Post-Routed calls
- Uses Unified CVP in Site1/Site5 for call treatment and queueing
- Uses the Unified CallManager cluster in Site1/Site5 for call processing
- Operates as a call center

[Table 1-22](#) lists the skill sets of the agents at the South-Central Retail Center (total BHCA: 9,062) and the agent to BHCA numbers.

Table 1-22 Agent Profile for South-Central Retail Center (Site8)

Site	Skills and Services	Number of Agents	BHCA
Call Flow #2a	#805 – Electronics & Personal Computers	207	3,312
Call Flow #2a	#806 – Major Appliances	65	1,040
Call Flow #2a	#807– Music and Movies	60	1,020
Call Flow #2a	#808 – Computer Technical Support	174	3,132
Call Flow #2b	#8081 – Conferences/Transfers from Site6	16	288
Call Flow #2b	#8082 – Conferences/Transfers from Site7	15	270

Sample Cisco Unified Customer Voice Portal Post-Routed 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 3 types of sample call flows discussed in this section are as follows:

- [Call Flow #1a: Distribution Center Calls \(Inbound\)](#)
 - Catalog Order Skill Group
 - Order Status Skill Group
 - Specialty Items Skill Group
- [Call Flow #2a: Retail Centers Calls \(Inbound\)](#)
- [Call Flow #2b: Retail Center Calls \(Conference/Transfers\)](#)
- [Call Flow #3: Retail Credit Account Collection Calls \(Outbound\)](#)

Call Handling Overview

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

- Unified CallManager Cluster #1:
 - Unified CallManager cluster (CoW) at Site1/Site5
 - Agents are at Site6, Site7, and Site8

Traffic between Site1/Site5 and Site6 (in Cluster 1) is considered intra-cluster or occurring within their home cluster.
- Unified CallManager Cluster #2:
 - Unified CallManager cluster (CoW) at Site3
 - Agents are at Site3
- Unified CallManager Cluster #3:
 - Unified CallManager cluster at Site7
 - Agents at Site7 that handle conference/transfers from Site6 and Site8

Traffic between sites at Cluster 1 and Cluster 2 is considered inter-cluster or crossing between clusters.

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, the 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 Site6 is first sent to agents at Site6. If agents are unavailable at Site6, then the call is only sent to available agents at Site7 or Site8.

If agents are not available at any of the above sites, the call is usually queued for an agent in that skill group at the local site (Site6 in the 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.

All BHCA and Erlang Calculations are made with the following assumptions across all call flows:

- Average Talk Time for each call is 2 minutes (120 seconds)
- Each inbound call is greeted with a 10-second opening menu/ greeting
- All inbound calls have a 30-second after call work time
- The Service Level Target for SS&S is that 80% of calls are answered within 20 seconds

At the distribution center, multiple voice gateways are loaded with the Cisco Unified Survivable Remote Site Telephony (Unified SRST) functionality to allow them to process calls, even if the connection to the data centers fails. In the event that the SRST mode kicks in, all calls are automatically re-routed to another site using a direct transfer to the main number of the target site.



Note

Retail centers do not use the SRST functionality.

Call Flow #1a: Distribution Center Calls (Inbound)

SS&S provides customers with local and toll-free phone numbers to call into their regional distribution centers. The toll-free numbers are routed by the long distance carrier based upon the originating location of the caller and presented to the regional site on a local number mapped to that site.

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 local agents who provide that service for that region.

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

- Unified CallManager Cluster #1: Agents at Site6, Site7, and Site8
- Unified CallManager Cluster #2: Agents at Site3

[Table 1-23](#) lists the distribution center and its local access number, estimated BHCA, and agents for inbound Unified CVP Post-Routed calls.

Table 1-23 *Distribution Center Local Lines*

Site	Local Number	Est. BHCA / Site	Agents / Site
Distribution Center (Site3)	785-232-7777	7,942	500



Note

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

Call Flow Logic

Depending on the destination, calls coming into the distribution center are presented with a welcome greeting and then with an opening menu (of 10 second duration):

“Thank you for calling Siren Supplies & Stores’ Distribution Center. Please select from the following services:

Press 1 if you wish to place a new order from our catalog

Press 2 if you want to check on the status of an order

Press 3 for our Speciality Items Catalog

Or stay on the line and someone will assist you shortly.”

If the caller presses:

- 1, the call is routed to any available agent at the local site who has the ‘x301 – Catalog Order Skill.’
- 2, the call is routed to any available agent at the local site who has the ‘x302 – Order Status Skill.’
- 3, the call is routed to any available agent at the local site who has the ‘x303 – Specialty Items Skill.’
- An invalid selection, the system terminates the call after playing the following message:
“Sorry you are having difficulty. Please try again later. Goodbye.”.

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

Call Handling and Queuing

SS&S has installed the local line calling functionality to encourage local contact with the central distribution center. All calls coming into the local line at the Distribution Center (Site3) will 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 agents available in each of the skill groups, the call is held in queue for the next available agent in that skill group at that site.

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, etc.

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.

Call Flow #2a: Retail Centers Calls (Inbound)

SS&S provides customers with local and toll-free phone numbers to call into their retail centers. The toll-free numbers are routed by the long distance carrier based upon the originating location of the caller and presented to the retail site on a local number mapped to that site.

Table 1-24 provides a list of the retail centers and their local access numbers, estimated BHCA, and agents per retail site for inbound Unified CVP Post-Routed calls.

Table 1-24 **Retail Centers Local Lines**

Site	Local Number	Est. BHCA / Site	Agents / Site
Mid-Atlantic Retail Center (Site6)	707-222-7777	10,309	683
North-Central Retail Center (Site7)	773-222-7777	4,665	291
South-Central Retail Center (Site8)	972-222-7777	8,504	537

**Note**

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

Call Flow Logic

Calls coming into the retail centers are presented with a welcome greeting and then with an opening menu (of 10 second duration) specific for that site:

“Thank you for calling Siren Supplies & Stores’ (Mid-Atlantic/North-Central/South-Central) Super Center. Please select from the following departments for assistance:

Press 1 for Electronics and Personal Computers

Press 2 for Major Appliances

Press 3 for Music and Movies

Press 4 for Technical Support for your Siren PC or Electronic Equipment

Or stay on the line and someone will assist you shortly.”

If the caller presses:

- 1, the call is routed to any available agent at the local site who has the ‘x05 – Electronics Skill.’
- 2, the call is routed to any available agent at the local site who has the ‘x06 – Major Appliances Skill.’
- 3, the call is routed to any available agent at the local site who has the ‘x07 – Music and Movies Skill.’
- 4, the call is routed to any available agent at the local site who has the ‘x08 – Technical Support Skill.’
- An invalid selection, the system terminates the call after playing the following message:
“Sorry you are having difficulty. Please try again later. Goodbye.”

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

Call Handling and Queueing

If there are no agents available in each of the skill groups, the call is held in queue for the next available agent in that skill group for that site.

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, etc.

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.

Call Flow #2b: Retail Center Calls (Conference/Transfers)

A Technical Support line is available for customers who may need assistance over the phone for laptops and other mobile devices they may have purchased at the retail center. When customers call in on a toll-free line from locations other than their home location, they may be sent to the wrong retail center.

Studies estimate that 5% of calls coming into the Technical Support line at a retail center are mis-directed and have to be transferred by agents.

Usually, the agent conferences in another agent from the retail center where the purchase was made or, at other times, just transfers the call to the other site's internal number. Each site has an internal number that is used to directly access the Technical Support group from other sites to avoid having to go through the opening menu again.

Table 1-25 provides the internal number for the Technical Support groups at the retail centers.

Table 1-25 Retail Centers Internal Numbers for Technical Support

Site	Internal Number for Order Entry Skill Group
Mid-Atlantic Retail Center (Site6)	707-222-8324
North-Central Retail Center (Site7)	773-222-8324
South-Central Retail Center (Site8)	972-222-8324

Call Flow #3: Retail Credit Account Collection Calls (Outbound)

The outbound Collections skill group performs follow-up calls to SS&S customers using the Collections campaign.

The group of 73 agents make an estimated 1,314 BHCA outbound calls. This number refers to the number of successful calls, which is estimated at 30% of the total calls placed by the Unified OUTD as shown below:

Calls Answered: 1,314 (30% of call volume)

Calls Busy: 1,533 (35% of call volume)

Calls Not Answered: 1,533 (35% of call volume)

Total Calls Dialed: 4,380

Call Handling and Queuing

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.

If the customer asks the agent to call back later, the agent can set up the system in one of two ways:

- Use the personal callback feature, to call the customer back at a scheduled time.
- Use the system callback feature, to have the system call the customer back at a scheduled time and connect the customer with any available agent in the Collections group.

At the Mid-Atlantic Retail Center (Site6), calls are made in the Predictive Mode, using agents from the '604 – Retail Credit Account Collections' group to make the outbound calls.

If the outbound Campaign detects an answering machine (or call answering service), the system plays the following message to the customer before terminating the call:

“We have an important message for you from Siren Supplies and Stores. Please call us at 1-866-747-3677 as soon as you can. Thank you.”

Emergencies and Special Situations

If a site has to be closed for an emergency, for instance, a bomb threat, a special site emergency skill group is defined with a specific agent associated with it. All the standard call flows check to make sure the emergency agent has not logged into the emergency skill group, before attempting to process the call for that site.

- If a site is closed in an emergency close situation, all calls ignore the local agents for that closed site and consider only agents from other sites, provided they are also not closed for the same reason. If all sites are in emergency close mode, the system acts as if the company is closed or outside of normal calling hours.

Calls queued for a site that is in emergency close will be re-qualified to select another site for the queue.

- If a site is not closed and is scheduled to be open, but the agents are unable to log in for some reason (snow storm, black-out, etc.), the system does not accept calls into the queues for that site and treats the site as if it was closed.
- If a site is closed due to a national holiday, customers' calls into the contact centers are treated similar to the outside of normal calling hours closure and a message informs the caller that the company is closed for the holiday.

Summary of Call Handling and Queuing

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 1-26](#) summarizes this information and lists the different types of sample Unified CVP Post-Routed call flows discussed previously, the sites that are eligible to handle them, and their treatment by the contact center system.

Table 1-26 Summary of Call Handling and Queueing for Unified CVP Sites

Call Flow#	Call Type	Eligible Sites	Call Treatment by System
Call Flow #1a	Distribution Center Inbound Unified CVP calls	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. • If more than 20 calls in queue, plays message to call back. • Caller must terminate call by hanging up.
Call Flow #2a	Retail Center Inbound Unified CVP calls	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. • If more than 20 calls in queue, plays message to call back. • Caller must terminate call by hanging up.
Call Flow #2b	Retail Center 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 logged on but taking another call, places in queue for that agent and plays message to wait or terminate call.
Call Flow #3	Retail Credit Account Collections	Only Site6 handles outbound calls	<ul style="list-style-type: none"> • Uses predictive Unified OUTD. • If called party answers, connects call to agent. • If called party does not answer, does not try the call again within campaign time. • If called party asks agent to call back, uses personal callback or system callback features to call customer back at scheduled time. • If answering machine is detected, system leaves message asking customer to call back and terminates call.
Special Calls	Shutdown due to Emergency, Bad Weather, or Holiday	All sites	<ul style="list-style-type: none"> • If the site is closed, does not consider the site for calls. • If call is queued at closed site, reroutes to an open site. • If all sites are closed, does not accept calls into queues, and plays <i>site closed</i> message.

