3Com® IP Contact Center Implementation Planning Guide

System Release 7

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Contents

About This Guide 5
Who Should Read This Guide 5
How This Guide is Organized 5

Chapter 1. Overview and System Requirements 7
Implementation Process Overview 8
Discovery, Planning, and Design 8
Application Configuration and Test 9
User Acceptance and Training 9
Deployment 10
Kickoff and Discovery Meeting 11
Your Staff 11
3Com Implementation Team 12
Implementation Plan 12
3Com IP Contact Center Multi-site Hub and Node Architecture 13
Hardware, Software, and Network Requirements 13
Desktop Requirements 14
Headset and Adapter Requirements 14
Hardware Requirements 15
Software Requirements 15
User Access From Remote Locations 16
Server Hardware Requirements 17
Remote Access Cards 17
Virtual Private Network (VPN) Hardware 18
Voice Gateway Hardware 18
Security Requirements 18
Networking Protocols 19
Voice Requirements 20
Requirements for Voice over IP (VoIP) 20
Bandwidth 20
Latency 21
Audio Quality 21
E-mail Requirements 22
Web Requirements 22
Server Components 22

Networking 23
Security 23
Firewall Access 23
FAX Requirements 24
Database Requirements 25
External Database Storage and Hardware Requirements 26
Database Backup Requirements 26
Space and Environmental Requirements 28
Power Requirements 28
Equipment and Location 28
Power Consumption 29
Cabling Requirements 29
Network Connection 30
Telephony Connection 30
T1 Connections 30
Channel Service Unit (CSU) for T1 Trunks 30
Power Supplies 31
IP Address and Host Name Requirements 31
Domain Name Service (DNS) Requirements 32
Network Time Protocol Requirements 32
DS1 Service Specifications 33

Chapter 2. Preparing for Configuration 35
General Issues 36
Planning for Contact Routing 36
Planning Your Business Logic 38
Planning for the Configuration of Your Workforce 43
Planning for E-mail Management 49
Planning for Web Collaboration 52
Designing the Launch Pages 53
Defining Web Sources 55
Obtaining a Web Server Certificate 56
Developing Pages for Sharing 56
Planning for Voice Support 58
Planning for CRM Integration 60

Glossary 63

PREFACE

About This Guide

The purpose of this guide is to help you prepare for a successful implementation and configuration of your 3Com IP Contact Center.

Who Should Read This Guide

This guide is intended primarily for those individuals in your organization who are planning for and implementing the 3Com IP Contact Center system in your contact center.

How This Guide is Organized

The chapters in this guide provide the following information:

- Chapter 1, "Overview and System Requirements," provides a high-level overview of the implementation process and outlines the system requirements for your implementation.
- Chapter 2, "Preparing for Configuration," guides you through the decisions you need to make to set up your 3Com IP Contact Center.

A glossary is included at the back of this guide.

CHAPTER 1

Overview and System Requirements

This chapter describes the steps involved in the implementation of your 3Com IP Contact Center 7.0 system and the individuals involved in the process. The chapter also provides hardware, software, and network requirements and guidelines you must be aware of when you plan your implementation.

Note: *The information in this document is intended for customers who plan to install the generally available 3Com IP Contact Center 7.0 system. If you are an existing 3Com customer and are planning to upgrade to the current release, contact 3Com Customer Services.*

This chapter includes the following sections:

- Implementation Process Overview
- Kickoff and Discovery Meeting
- 3Com IP Contact Center Multi-site Hub and Node Architecture
- Hardware, Software, and Network Requirements

Implementation Process Overview

The following steps provide an overview of your participation in the process of implementing your 3Com IP Contact Center system. Your 3Com implementation team will help you complete some of the tasks, as indicated.

Discovery, Planning, and Design

1. **Attend the Kickoff and Discovery Meetings**.

   Your 3Com project manager will hold one or more Kickoff and Discovery Meetings to discuss options for your implementation and to gather configuration information from you. During these meetings, a general timeline for your implementation will also be discussed. For information about who should attend the planning meeting, see "Kickoff and Discovery Meeting" on page 11.

2. **Review the written implementation plan.**

   Your 3Com implementation team will develop a Functional Requirements Document based on the information gathered in the Kickoff and Discovery Meetings. The Functional Requirements Document will describe in detail your implementation plan. This document will be sent to you for your review and approval before your system configuration. For information about the implementation plan, see "Implementation Plan" on page 12.

3. **Attend an Application Design Session.**

   Your 3Com project manager and application engineer will hold an Application Design Session to specify how your 3Com IP Contact Center applications will work together. During this session, you will define configuration values for your specific requirements.

   The topics discussed will include user definitions, classifications, routing, and workflow design.

   Note: *You must answer the questions in Chapter 2 of this guide, and return your answers to your 3Com project manager before attending the Application Design Session.*

4. **Develop a test plan**.

   Your 3Com project manager and application engineer will work with you to develop a User Acceptance Test Plan for your implementation.

5. **Order and install your equipment**.

   To order equipment, follow the guidelines provided in this guide. Your 3Com project manager can help you order this equipment. For more information, see "Hardware, Software, and Network Requirements" on page 13 and the *3Com IP Contact Center Order Specifications* document provided by your implementation team.

Application Configuration and Test

1. **Build and test workflows and applications**.

   Your 3Com application engineer will build the necessary workflows and CRM (customer relationship management) application screen pops, if applicable.

   At the 3Com site, a test 3Com IP Contact Center system will be built and configured in compliance with the information provided in the Functional Requirements Document and the information gathered during the Application Design Session. The system configuration will be tested at the 3Com site before installation at your location.

User Acceptance and Training

1. Install and configure hardware.

   You are responsible for installing your server hardware and any necessary cabling, network connectivity, and network configuration. You are also responsible for providing connectivity to your PBX (Private Branch Exchange) system or service provider.

   Your 3Com network engineer will install the 3Com IP Contact Center server software with default data in order to test the server setup, voice gateway configuration, network connectivity, and network configuration.

2. **Configure the 3Com IP Contact Center system.**

   Your 3Com project manager, application engineer, and network engineer will be responsible for configuring your 3Com IP Contact Center system in compliance with the information provided in the Functional Requirements Document.

3. **Attend training**.

   Your 3Com application engineer will hold three types of training sessions:

   - A Train the Trainer session to train the individuals from your company who will conduct internal training.
   - A training session to train the individuals from your company who will act as supervisors.
   - A training session to train the individuals from your company who will act as 3Com IP Contact Center administrators.

     Note: *This training session, held at the 3Com site, is available at an additional cost.*

Deployment

To successfully deploy the 3Com IP Contact Center system, follow the steps below:

1. **Cut over to your 3Com IP Contact Center system.**

   At this time, your 3Com IP Contact Center system will "go live" for the first time. All key members of your 3Com implementation team will be dedicated to the success of your 3Com IP Contact Center system at this important time.

2. **Monitor your 3Com IP Contact Center system.**

   Your 3Com IP Contact Center system will be closely monitored for a period following activation to ensure proper operation. All applications will be verified to ensure that routing works as designed and service level objectives are being met.

3. **Learn 3Com support procedures.**

   Your 3Com project manager will introduce you to the 3Com Customer Support manager and will describe support processes and procedures to make sure that you receive the best service from 3Com Customer Support.

Kickoff and Discovery Meeting

At the Kickoff and Discovery Meetings, an implementation team from 3Com will work with you to establish all the requirements for a successful implementation. These professionals will work with you to understand your key business objectives and assist you in determining the solutions that will best meet those objectives.

The 3Com project manager is responsible for customer satisfaction throughout all phases of the implementation and deployment of your system. You can discuss any questions or issues with the project manager as they arise. At the meeting, the project manager will review your requirements and discuss roles and responsibilities with all parties involved. To ensure success, it is critical that all individuals involved in your implementation be present at the meeting.

This section describes the participants and the project plan required for successful implementation of the 3Com IP Contact Center system.

Your Staff

3Com recommends that you provide the following individuals to participate in the Kickoff and Discovery Meetings:

- Customer project manager—Planner and coordinator of the 3Com IP Contact Center system implementation. This individual is the point of contact between your organization and the 3Com project manager.
- Information technology representative—Technical contact responsible for describing your system, network, and telecom configuration to the 3Com implementation team and communicating any changes to the 3Com project manager in a timely manner.
- 3Com IP Contact Center administrator—Ongoing administrator of your 3Com IP Contact Center.
- CRM administrator—Administrator responsible for maintaining the CRM solution for your organization.
- Business line manager—Individual responsible for call-flow routing decisions.
- Anyone else who will participate in the implementation or who needs to approve what is being put in place.

3Com Implementation Team

3Com provides the following staff:

- Project manager—Planner and coordinator of the 3Com IP Contact Center system implementation. This individual is the main point of contact between your organization and the 3Com implementation team, and is directly responsible for customer satisfaction.
- Application engineer—Individual responsible for building your voice, e-mail, and Web collaboration workflows and your overall system configuration in compliance with the Functional Requirements Document. The application engineer will also conduct training prior to and immediately following the 3Com IP Contact Center system cutover.
- Account manager—3Com sales representative.
- Sales engineer—Technical contact throughout the sales process.
- Network engineer—Individual responsible for helping you optimize your network for the 3Com IP Contact Center system. The network engineer will work with you on any PBX integrations.

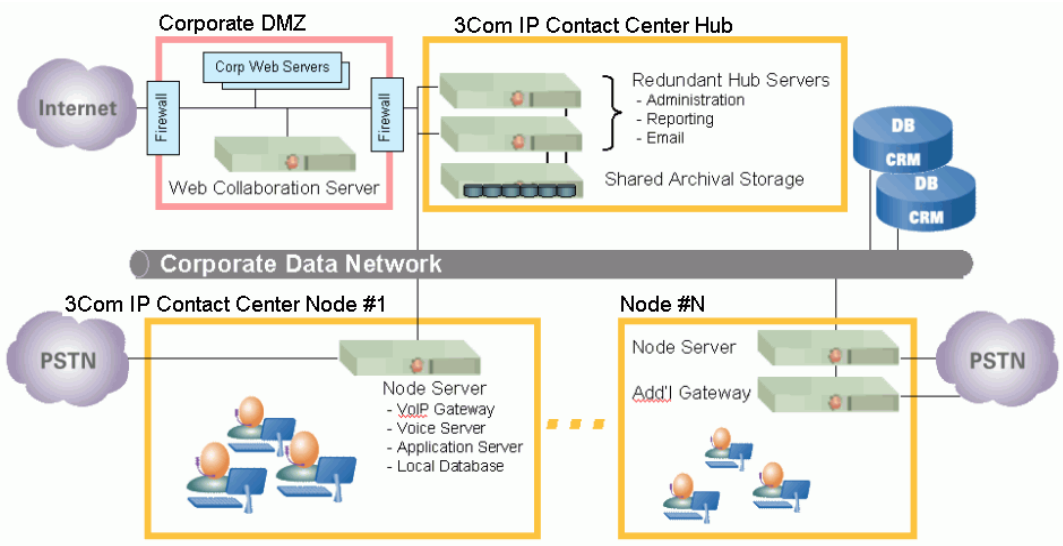
Implementation Plan

After the Kickoff and Discovery Meetings, your 3Com project manager will provide you with a written implementation plan. This includes the following:

- The requirements and responsibilities of all participants.
- A schedule outlining the milestones and completion dates for your implementation.
- A list of network connection, software, and hardware requirements.
- Contact information for key participants on your implementation team.

3Com IP Contact Center Multi-site Hub and Node Architecture

The following diagram illustrates the high-level, logical architecture of the 3Com IP Contact Center system.



For specific configuration information, contact your 3Com IP Contact Center project manager.

Hardware, Software, and Network Requirements

You are responsible for supplying, installing, and maintaining your desktop, system, and network hardware and software. Before your 3Com IP Contact Center system is deployed, the hardware and software listed in this section must be installed and configured.

This section describes the various requirements for your 3Com IP Contact Center system.

Desktop Requirements

Following is a description of the minimum computer software and hardware requirements, and the equipment you must provide for each agent, supervisor, and administrator desktop.

Note: *Even if outbound calling is enabled for agent phones, the phones cannot be used for emergency 911 calling. Alternative phones should be provided to your staff for this purpose.*

Headset and Adapter Requirements

The following table provides a list of approved headsets and adapters for use with the IPCC Soft Phone.

Headset vendor	Headset model	USB adapter
Plantronics	H41	DA60
Plantronics	H81	DA60
Plantronics	H91	DA60
Plantronics	H101	DA60
Plantronics	H261	DA60
Plantronics	H41N	DA60
Plantronics	CS50	DA60
GN Netcom	GN 2225/2200	GN 8110 or Plantronics DA60
GN Netcom	GN 2130 NX	GN 8110 or Plantronics DA60
GN Netcom	GN 9120	GN 8110 or Plantronics DA60
Sennheiser	SH350/SH330	N/A

To use headsets other than those listed in the table above, make sure the following requirements are met:

- USB connector that uses the standard Windows USB audio driver
- Digitally signed Microsoft Windows device driver
- Volume control for headset microphone and audio
- No PC sound card requirements
- No perceivable processing delay (10 ms or less)
- No return gain; that is, the return loss echo must be 40 dB or higher
- An external speaker device that is controlled by the computer's sound card, if users plan to enable external audio for the incoming call ring.

Hardware Requirements

Note: *3Com recommends the Dell OptiPlex GX520 computer for the 3Com IPCC Desktop.*

- Pentium III, 1.4 GHz processor

  Note: *Though the 3Com IPCC Desktop will operate properly on a computer with a Pentium III, 1.4 GHz processor, 3Com recommends a Pentium 4, 2.4 GHz processor for optimum performance.*

- 1 GB or more of RAM (with 256 MB available for 3Com IP Contact Center)
- 20-GB hard disk drive
- 50 MB of free space on the hard disk drive
- 19-inch (CRT) or 17-inch (flat-panel) monitor, keyboard, and mouse

  Note 1: *The screen resolution must be set to 1280 x 1024 or higher for the CRT and for the flat-panel monitor.*

  Note 2: *The color depth should be set to High Color (24-bit) or, if the user is running Windows 2000, True Color (24-bit).*

- 10/100 network interface card (NIC)
- Active USB port

Software Requirements

- The desktop computer must have one of the following operating systems:
  - Microsoft Windows XP with Service Pack 2 and all current security updates.

    Note: *If the Windows firewall is enabled on the client computers, the computers must be configured with the firewall settings described in the 3Com IP Contact Center Desktop Installation Instructions. This document is available on the latest version of the "3Com IP Contact Center Documentation CD."*

  - Microsoft Windows 2000 with Service Pack 4 and all current security updates.

- Microsoft Internet Explorer 6.0, with all current security updates, configured as described in the *3Com IP Contact Center Desktop Installation Instructions*.
- Java Plug-in 1.4.2_04 (Java 2 Runtime Environment [JRE]) product from Sun Microsystems.

  If the Java Plug-in 1.4.2_04 product is not already installed, you will be prompted to allow the system to install it automatically the first time you log on to the 3Com IPCC Desktop. (Administrative privileges are required to do this.)

User Access From Remote Locations

The 3Com IP Contact Center environment enables 3Com IPCC Desktop users—such as agents, supervisors, managers, and administrators—to access the 3Com IP Contact Center system from a location that is either local or remote to the 3Com IP Contact Center system. The user must be able to connect to the corporate network on which the 3Com IP Contact Center system resides.

Users who access the 3Com IP Contact Center system from a remote location can use one of the following methods:

- Wide Area Network (WAN) Access
  - Users connect to the corporate network from a branch office or in the field.
  - Users have the same 3Com IPCC Desktop access as if they had logged on locally (through a LAN) from the corporate site.
  - Users can make and receive voice calls, send and receive e-mail messages, establish Web collaboration sessions, view reports and statistics, and administer the system based on their user permissions.
- Virtual Private Network (VPN) Access
  - Users connect to the corporate network through a VPN connection over a DSL or cable modem. These users work from a remote location such as a home office or a field office that does not have direct corporate network access.
  - Users have the same 3Com IPCC Desktop access as if they had logged on locally (through a LAN) from the corporate site.

– Users can make and receive voice calls, send and receive e-mail messages, establish Web collaboration sessions, view reports and statistics, and administer the system based on their user permissions.

Although users can use a VPN to make and receive voice contacts, there is no guaranteed quality of service between the enterprise and the user since open Internet bandwidths are unpredictable and could impact audio quality.

Server Hardware Requirements

For information on hardware server requirements for configuring the 3Com IP Contact Center Hub and 3Com IP Contact Center Node, contact your project manager. Additional server hardware requirements are described below.

You can use the order specifications provided in the *3Com IP Contact Center Order Specifications* document. Your 3Com project manager can assist you in obtaining this equipment.

Access to all servers and gateways must be provided through a monitor, keyboard, and mouse. A switchbox (KVM) should be used to share a monitor, keyboard, and mouse among servers.

For remotely accessing the IP Contact Center server components and for establishing the PSTN interface, follow the guidelines provided below.

Remote Access Cards

Remote access cards enable 3Com Support personnel to troubleshoot and maintain 3Com IP Contact Center server components from a remote location. Be aware of the following:

- Remote access cards are required in all 3Com IP Contact Center servers.
- You must provide 3Com with an IP address and host name for each remote access card. For additional information about IP address requirements for remote access cards, see "IP Address and Host Name Requirements" on page 31.
- Remote access cards must be wired before the 3Com IP Contact Center system installation begins.

Virtual Private Network (VPN) Hardware

Normally, 3Com provides the VPN hardware that 3Com Support personnel use to access your 3Com IP Contact Center system.

If you already have VPN hardware and would like 3Com Support personnel to use it to access your 3Com IP Contact Center system, the 3Com network engineer will work with your network engineer to configure a compatible solution.

With either the 3Com VPN or your own, specific ports and protocols must be allowed to pass through the VPN connection without being blocked by a firewall or other security device. Consult your 3Com project manager for more details on the specific requirements.

Voice Gateway Hardware

3Com provides the PSTN interface card(s) for your 3Com IP Contact Center system.

The 3Com implementation team will install and configure the voice gateway server components with your 3Com IP Contact Center system. For information on rack layout guidelines, consult your 3Com project manager.

Security Requirements

The e-mail and Web collaboration servers allow external access to the 3Com IP Contact Center network and therefore proper security measures must be in place to ensure that these systems are not vulnerable to malicious content, such as viruses or denial of service (DoS) attacks.

Although the products that provide system security are not part of the 3Com product offering, it is extremely important for the operation of your contact center and the 3Com IP Contact Center system that you identify, install, and maintain an external set of security solutions that can provide protection from viruses, malicious content, and DoS attacks.

When you purchase Web collaboration, you must provide your own DMZ for protection from malicious content. Other solutions are possible and can be discussed with your 3Com implementation team.

Networking Protocols

The following protocols are used among the hub, the node, and the client components in the 3Com IP Contact Center system to communicate within the enterprise (behind your firewall).

Protocol	Port number	Purpose
TCP	22	SSH
	25	SMTP
	80	HTTP
	123	NTP
	443	HTTPS
	1521, 5500	Oracle
	7070	3Com IPCC Web Collaboration Server Administration Pages
	8025	SMTP Proxy on the Node Application Server
	8026	SMTP
	8080	HTTP and 3Com IPCC Web Collaboration server
	8225	SMTP
	8243	IMAP
	9001	Velocity application pages
	11000	Node Router
	12002	User Desktop Manager
	12100	Desktop Manager Server
	12200	Desktop Manager Client Server
	14001 and 14101	Service Manager
	14502	Real-Time Event-Processing
	24921	iCCJBossWatchDog
	1025-65535	JMS UIL2
UDP	5060	Voice Media Server (on the Voice server)
	5061	Voice Proxy (on the Voice server)
	2000-5000	Exchanges RTP with Gateways and IPCC Soft Phone
	8000-10000	Exchanges RTP with VMS

Note: *The information in the above table is preliminary. Please contact your 3Com project manager for the latest information.*

Voice Requirements

This section describes the requirements to support voice functionality in the 3Com IP Contact Center system.

Requirements for Voice over IP (VoIP)

The 3Com IP Contact Center system supports G.711 and G.729ab encoding.

- G.711 provides the closest to toll quality audio and requires approximately 85 Kbps unidirectional bandwidth (with L2/L3 headers).
- G.729ab provides nearly toll quality audio and includes built-in voice activity detection (VAD) that can reduce bandwidth consumption up to 35 percent. G.729ab without VAD requires 26.4 Kbps unidirectional bandwidth so, with VAD bandwidth, consumption could be reduced to approximately 17 Kbps unidirectional bandwidth.

To ensure optimal audio quality, make sure that your network conforms to the following basic recommendations:

- The local area network (LAN) requires a switched 100 Mbps network.
- To prioritize voice packets on the network, QoS (Quality of Service) must be enabled.

Bandwidth

Bandwidth requirements for voice traffic and system data traffic between the 3Com IP Contact Center hub and nodeare described in the sections below.

Voice Traffic

Make sure that your network has the appropriate bandwidth to support the voice traffic to and from your remote nodes.

System Data Traffic

The following table provides information about the bandwidth consumption between the hub and a node when there is no incoming contact traffic.

Note: *Interface from other nodes in a multi-node instance is not included.*

Description	Bandwidth used in bytes (octets) per second	Percent of T1 bandwidth used
The system is up with no agents logged on.	2700 (Minimum) 8100 (Maximum) 4500 (Average)	1.4% 4.3% 2.4%
One agent is logged on.	900	<1%
25 agents are logged on.	9500	5%
Typical provisioning changes are being made, such as changing a user, classification, or gateway attribute.	25,500	13%

Latency

Latency is the delay between sending the IP packet and the packet being delivered to the recipient. For example, on a cellular phone or an international call, it is common to notice slight delays in the conversation. The average person notices latency of 120 ms or more. Excellent latency is considered to be less than 100 ms and the highest acceptable latency is considered to be approximately 250 ms (one-way).

Latency for a typical VoIP call through the 3Com IP Contact Center is approximately 95–100 ms, with significantly higher numbers when the call is traveling over a WAN.

Audio Quality

General Audio Quality Considerations. In addition to latency, you must consider audio issues. If audio packets are lost during transmission, the 3Com IPCC Desktop user hears static or broken audio depending on the order of packet loss.

Audio packets are sent by means of the User Datagram Protocol (UDP) over an IP network. Unlike other common protocols (such as Transmission Control Protocol, or TCP), the packet is not retransmitted if the receiver fails to receive it. If there is congestion on the network, packets may have to wait for a period of time for space in the queue, increasing latency.

Even when the receiver system receives the packet, the packet may need to be discarded. The vocoder standard algorithm requires a timestamp for each audio packet when it is sent to the recipient. When the recipient receives the audio packet, the VoIP endpoint examines the timestamp. Packets that are received in order are played and those that are received out of order are discarded.

These issues are prevented when QoS is correctly configured.

International Audio Quality Considerations. To ensure the highest quality of the audio in an international 3Com IP Contact Center system configuration, use 3Com IP Contact Center system components to record audio sources such as audio prompts.

If you record audio sources outside the 3Com IP Contact Center system, make sure that the audio is recorded at 16-bit mono, at a frequency of 8,000 Hz and that the audio file is saved in an 8-bit mono, at a frequency of 8,000 Hz, in the Mu-Law format.

Note: *Mu-Law is the standard codec algorithm for pulse code modulation (PCM) from the CCITT (Consultative Committee for International Telephone and Telegraph), which is used in the United States and Japan. The other type of codec algorithm, A-Law, is the standard used in Europe and elsewhere.*

E-mail Requirements

To prevent exposing the 3Com IP Contact Center e-mail management system to the Internet, you should provide an e-mail relay server that has been thoroughly tested against external security risks. The 3Com IP Contact Center e-mail management system does not provide virus protection or block unsolicited e-mail messages (also called spam), so all e-mail messages should be scanned before entering your 3Com IP Contact Center system.

Web Requirements

This section describes the requirements - server, networking, security and firewall access - for 3Com IP Contact Center web collaboration activities.

Server Components

The 3Com IPCC Web Collaboration server contains three server components accessible by the application servers at the node, by 3Com IPCC Desktop users, and by your Web customers. The server components are described in the table below.

Server component	Description	Host name conventions
Collaboration Application Server (CAS)	Processes requests for routed Web collaboration sessions, meet-me sessions, and callback requests, and communicates directly with the Web collaboration server at the hub.	jetty-*hostname.domain*
Client Connection Engine (CCE)	Manages caller and 3Com IPCC Desktop user connections to the Web Collaboration System. When a client (caller or 3Com IPCC Desktop user) connects to the CCE, a Web collaboration session is created and enables the client to exchange text messages and share Web pages.	server-*hostname.domain*
Authenticated Co-Browsing Engine (ACE)	Manages sharing of HTTP/S pages during a session.	*hostname.domain*

Networking

An additional set of three IP addresses is required to install the 3Com IP Contact Center Web Collaboration server in a DMZ environment. These addresses should be routable from end-user systems and be mapped to the CAS, CCE, and ACE server component IP addresses by the firewall.

Note: *If the customer's network rules do not permit routing from their private network to their DMZ, a third set of three IP addresses is required to allow the instance to access the various Web Collaboration server components. While this configuration is supported, it is not recommended.*

Security

When you purchase Web collaboration, you must provide your own DMZ for protection from malicious content.

If you do not purchase the security appliance, you must provide virus and DoS protection in your DMZ.

Firewall Access

The 3Com IP Contact Center system requires the following access through your organization's firewall.

From	To	Port numbers	Protocol	Server component
Internet	Web Collaboration Server	80	TCP	CAS
		80 and 443	TCP	CCE
		80 and 443	TCP	ACE
3Com IPCC Desktop user	Web Collaboration Server	80 and 443	TCP	CCE
		80 and 443	TCP	ACE
Node Application Servers	Web Collaboration Server	80 and 443	TCP	CCE
3Com IPCC Desktop user (technician)	Web Collaboration Server	9001	TCP	CAS
		7070	TCP	CAS
Web Collaboration Server	Internet	Any[1]	TCP	ACE
Web Collaboration Server	Hub Application Server	1024-65000	TCP (JMS)	Hub Application Server
			TCP	Hub Application Server
Web Collaboration Server	E-mail server at the hub	25	TCP	E-mail Server
Web Collaboration Server	Database server at the hub	1521	TCP	Database Server

[1]The ACE makes HTTP/S requests to the target Web servers on any port required by a shared URL.

FAX Requirements

The 3Com IP Contact Center system uses a combination of features offered in the 3Com IP Contact Center e-mail server and a third-party fax server to route inbound and outbound faxes. Faxes are converted to e-mail attachments and then routed through the 3Com IP Contact Center system as e-mail contacts.

To support this capability, you need to provide a fax server that meets the following requirements:

- Compatible with Microsoft Outlook Express
- Provides an associated SMTP server/gateway option
- Manages fax redelivery (for example, if fax delivery is unsuccessful between the fax server and the customer)
- Either allows the use of the native Windows Fax Viewer or includes a fax viewer for the fax server, if attachments are in a proprietary format

- Does not modify the e-mail header fields in a way that makes it incompatible with the 3Com IP Contact Center e-mail server (for example, the server must not modify the From field in the e-mail message)
- Transcribes any necessary routing information into text and inserts it into the Subject line or the body of the e-mail message that is sent to the classification
- Transcribes text into a customer's fax number in order to fax a document back to the customer

Database Requirements

The 3Com IP Contact Center system relies on a high-availability database for its runtime operation. To support the contact center's mission-critical nature, the 3Com IP Contact Center system uses Oracle RAC as the high-availability solution. With Oracle RAC, the database image resides on an external storage unit that is accessible to multiple database servers that run concurrently. If one server fails, Oracle RAC automatically moves the workload to the remaining server or servers.

To ensure fault tolerance, the 3Com IP Contact Center system offers RAID (Redundant Array of Independent Disks) protection, which enables the system to remain operational if a disk drive fails. The database server requires RAID level 1 protection. RAID level 1 protection stores an exact duplicate of the data on separate disk drives (also called mirrored disks), which provides data redundancy if one of the disk drives fails.

The external storage unit requires RAID level 10 (0+1) protection. RAID level 10 provides both hard disk drive mirroring and striping, which divides the data into blocks and spreads the data over multiple disk drives. Disk drive striping can expedite operations that retrieve data from disk storage.

External Database Storage and Hardware Requirements

The database disk drives in a standard 3Com IP Contact Center system are mirrored, therefore, the maximum usable disk storage space is half of the total disk space.

You are responsible for ordering the database storage hardware. For information, refer to the *3Com IP Contact Center Order Specifications* document provided by your 3Com implementation team. During installation, the 3Com implementation team will install and configure the external storage component with your 3Com IP Contact Center system.

Database Backup Requirements

This section describes the required database backup tool, provided by the 3Com IP Contact Center system, including a set of supported methods for database backup.

Supported Methods. The 3Com IP Contact Center backup strategy supports the following methods and techniques for Oracle databases:

- Export and Import
  - **Database Backup**. The export/import backup technique is a logical database backup—that is, the backup extracts logical definitions and data from the database to a file. This technique provides a backup for a database object-level or disaster recovery. The database can be in either ARCHIVE or NOARCHIVE log mode. This backup technique does not support point-in-time recovery.
  - **Database Recovery**. The export/import backup technique can be used to recover database object definition and data in the following situations:
    - Human error (such as a dropped table)
    - Disaster or data corruption due to software or hardware failure
- Offline
  - **Database Backup**. An offline (or cold) backup technique is completed when the database is inactive and, consequently, requires service downtime. This technique is typically used during scheduled maintenance and product upgrades.
  - **Database Recovery**. The offline backup technique can be used to restore the database to a state in which the backup was taken, such as in the following situations:

  - Storage media failure
  - Disaster or product upgrade backout

- Online
  - **Database Backup**. The online (or hot) backup technique is performed while the database is up and active and, consequently, does not require service downtime. The database must be in ARCHIVE log mode. This backup technique supports point-in-time recovery.
  - **Database Recovery**. You can perform point-in-time recovery with an online backup as long as all archived logs up to that point are available. This technique can be used to recover database, tablespaces, and data files.

Required Process. The 3Com IP Contact Center system provides a built-in database backup utility that enables enterprise storage management solutions—such as solutions provided by VERITAS Software Corporation and EMC Corporation—to read the data in the 3Com IP Contact Center system staging area and then archive the data in your organization's media storage management facility.

You are responsible for setting up the enterprise storage management solution for your organization. Data is not retained in the 3Com IP Contact Center system after it is archived, so it is important that you schedule the enterprise database backup after the 3Com IP Contact Center daily backup is complete.

A backup directory (`/ora04/oradata/backup`) is automatically created after each 3Com IP Contact Center daily backup. You are responsible for copying the backup directory to a location from which your enterprise storage management solution can archive it. If space is an issue and it is not possible to archive the entire directory, be sure that you back up the following subdirectories:

- `/ora04/oradata/backup/nuco/export`
- `/ora04/oradata/backup/nuco/rman`

Note: *You may not install a Backup Agent on the 3Com IP Contact Center database server.*

You can use one of the following approved utilities to move the directory:

- SCP (Secure Copy)
- WinSCP (Windows version of Secure Copy)

Space and Environmental Requirements

Your equipment can be placed in an office environment. A fully controlled computer room environment is not necessary, but the equipment should be within 15 feet of your LAN and phone wiring. However, a controlled computer room is highly recommended.

The environmental conditions for the equipment cannot exceed:

- 50 to 95 degrees Fahrenheit (10 to 30 degrees Celsius)
- 10 to 85 percent non-condensing relative humidity

The space required for the 3Com IP Contact Center system equipment is specified in the following table.

Equipment item[1]	Number of required 19-inch rack units
Servers (IBM E Series x 346)	2-rack unit per server
3Com IPCC Gateway (IBM E Series x 346)	2-rack unit per gateway

[1]Ensure that enough rack space is reserved for future expansion.

Power Requirements

This section describes the requirements for equipment, location, and power consumption.

Equipment and Location

Locate each component within 6 feet of a grounded power outlet (120V/60 Hz) and provide an uninterrupted power supply (UPS) for each component.

Note: *3Com does not provide UPS protection equipment for your system. You need to make UPS protection equipment available at the time of installation.*

The power requirements for the 3Com IP Contact Center system equipment are specified in the following table.

Equipment item	Power requirements
Servers	Check manufacturer's specifications
3Com IPCC Gateway	Check manufacturer's specifications
VPN hardware	One 120V reliably grounded outlet

Power Consumption

The maximum power required for each server configuration varies. The 3Com implementation team will assist you in determining the power consumption needs for your 3Com IP Contact Center system during your meetings with them.

After you have determined your server power requirements, you can use the following formulas to determine the kVA for the UPS and the BTUs for the air conditioning units.

- **To calculate the kVA**:

  (Total volt-amps for *all* the equipment) / 1000 = kVA

  For example, 6265 volt-amps / 1000 = 6.265 kVA

- **To calculate the BTUs from the kVA**:

  kVA * .85 = kW

  kW * 3413 = BTUs

  For example,

  6.265 kVA * .85 = 5.32525 kWs

  5.32525 kWs * 3413 = 18,175 BTU's

Cabling Requirements

You are responsible for providing cables that connect the 3Com IP Contact Center system to the network, the voice gateway, and the power source.

The following sections provide recommendations and requirements for the network and telephony connections.

3Com recommends that you use factory tested pre-manufactured cables.

Network Connection

Each component requires a Cat-5 Ethernet (shielded twisted pair) cable to connect each NIC to the switch.

In addition:

- The 3Com IPCC Voice Gateway requires the following cable connections:
  - A Cat-5 Ethernet cable from the NIC to the network
  - A Cat-5 Ethernet cable from each AudioCodes TP-260 communication card to the network
- A 1-GB Ethernet crossover cable is required for network connectivity between the database servers.

Telephony Connection

The voice gateway provides a means for callers using Public Switched Telephone Network (PSTN) phones (both cellular and conventional) to access an IP-based contact center. The voice gateway answers incoming PSTN calls and places VoIP calls to the contact center. Similarly, IP-connected agents can use the voice gateway to place a call through the PSTN. The 3Com IPCC Voice Gateway supports most CAS (Channel Associated Signaling) and ISDN protocols and can be installed on the LAN to which the 3Com IP Contact Center system equipment is connected.

T1 Connections

To comply with Federal Communication Commission (FCC) regulations, use shielded cables for your T1 connections. The FCC has granted Class A approval for shielded cables.

Channel Service Unit (CSU) for T1 Trunks

In a typical T1 environment, a channel service unit (CSU) connects each trunk interface card to a T1 trunk line. The CSU provides a DS-1 interface to the T1 line and contains circuitry that allows the central office (CO) to perform tests remotely.

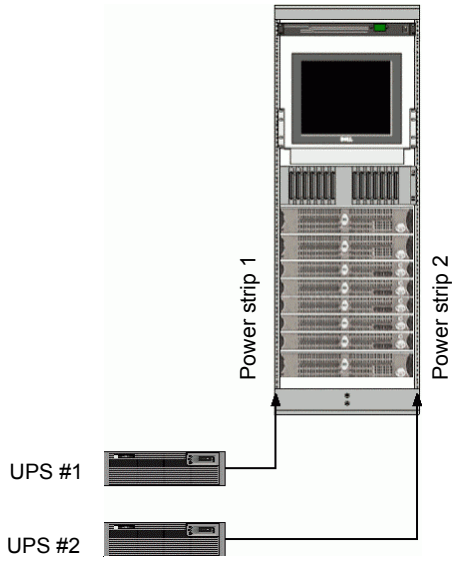
The AudioCodes TP-260 communication card that is required in the 3Com IP Contact Center system includes a CSU, so you do not need to purchase a separate CSU component.

Power Supplies

If you have one UPS, connect the power supply cords as follows:

- Connect one power cord to the UPS.
- Connect the second power cord to a 120V grounded power outlet (not the UPS).

If you have two UPS units, you can connect one UPS to each power strip as shown in the following illustration.



IP Address and Host Name Requirements

You must provide 3Com with subdomain and subnet to include IP addresses and host names for all components listed in the table below.

3Com also requires a separate VLAN for each hub/node.

Component	Static IP addresses	Host names	Comments
PSTN interface card	1 for each gateway	Optional	
Application server (hub and node)	1 for each server	1 for each server	
Database server	2 for each server	2 for each server	You must configure two IP addresses for each database server: a physical IP address and a virtual IP address.

Component	Static IP addresses	Host names	Comments
Voice server	1 for each server	1 for each server	
E-mail server	1 for each server	1 for each server	
Web collaboration server	3 (LAN) for each server	3 (LAN) for each server	For information about IP addresses and host name conventions required by the 3Com IP Contact Center system, see "Web Requirements" on page 22.
	3 (WAN) for each server	3 (WAN) for each server	
Configurable On-site Spare server	1 for each server	1 for each server	
Remote access cards	1 additional IP address for each server and gateway listed above	1 additional host name for each server and gateway listed above	For information about remote-access-card requirements, see "Remote Access Cards" on page 24.

Domain Name Service (DNS) Requirements

The 3Com IP Contact Center provides full forward (hostname to IP address) and reverse (IP address to hostname) zone files for a single subdomain in your corporate network. Your corporate IT DNS servers could pull zone files from the 3Com IP Contact Center and act as slave name servers. Alternatively, you could configure your corporate IT DNS servers to forward all queries for the subdomain in question to the 3Com IP Contact Center system. Contact your 3Com project manager for more information.

Network Time Protocol Requirements

3Com IP Contact Center system functions (such as logging and reporting) require that clock time on the 3Com IP Contact Center servers be accurate and synchronized. The 3Com IP Contact Center system uses Network Time Protocol (NTP) to do this.

To ensure that the server times are accurate and synchronized, do the following:

- Configure two NTP servers, each with four stratum-2 servers.
  - You will need a total of eight stratum-2 servers
  - The stratum-2 servers must be located geographically close to your data center

- Make sure the NTP servers are always available to the 3Com IP Contact Center.
- 3Com provides an NTP server in its data center in Mountain View, California. Make sure this server is reachable through the VPN that is configured between your data center and the 3Com data center in Mountain View.
- NTP uses UDP port 123 for communication, therefore make sure your VPN and firewall pass that port and protocol.

After you have configured your NTP and stratum-2 servers, 3Com Support personnel will install and configure NTP on your 3Com IP Contact Center system.

For more information about NTP, go to http://www.ntp.org/ or contact the 3Com Support Center.

DS1 Service Specifications

Use the following guidelines when you order your DS1 service from your telecommunications provider.

Product manufacturer:	AudioCodes, Ltd.
Product name:	TrunkPack TP-260
Framing:	ESF
Start:	N/A
Dial tone:	Disabled
Digits:	DTMF Note: Though pulse dial is supported, DTMF is preferred.
Interface code:	04DU9-B
Service code:	6.0P
Channel:	24
Ringer equivalence:	0.0A
Outdial senderized:	Yes
FCC registration number:	6NP ISR-36153-DE-N
USOC jack:	RJ48C
Trunk type/direction:	Bidirectional (2 way)
Signaling:	PRI or CAS
Line code:	B8Zs
Baud rate:	64 Kbps
Protocol type:	National ISDN2 or AT&T 5ESS

Caution: *Do not order circuits configured with NFAS.*

CHAPTER 2

Preparing for Configuration

Before you attend your Application Design Session, you must be prepared to make many decisions regarding how you want to set up the 3Com IPCC applications that route contacts. Your implementation team will help you address these issues as you work through this chapter.

This chapter includes the following sections:

- General Issues
- Planning for Contact Routing
- Planning Your Business Logic
- Planning for the Configuration of Your Workforce
- Planning for E-mail Management
- Planning for Web Collaboration
- Planning for Voice Support
- Planning for CRM Integration

General Issues

Make sure that someone attending the Application Design Session is prepared to address technical issues such as specifics regarding your agent and trunk setup, and business issues related to intended routing plans and 3Com application use.

Technical lead _____

Make sure that personnel attending the Application Design Session have gathered information, such as intended routing information and group requirements, from members of your staff who cannot attend the workshop.

Identify your system administrator (the person responsible for building and maintaining your database). Consider appointing a backup system administrator and invite this person to the Application Design Session.

System administrator _____

Backup system administrator _____

Planning for Contact Routing

Bring to the Application Design Session a clear understanding of how you want your contacts routed. You will use this information later to develop workflows.

A workflow is a set of instructions that tells the system how to process and deliver contacts, handle the work progress of agents, and control system-level behaviors. You define workflows using 3Com IPCC Workflow Builder.

To plan for contact routing, consider the following areas.

- Identify the different types of contacts handled by your 3Com IP Contact Center (voice, Web, e-mail, voice message, and callback).

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  _____
  _____
  _____

- Determine the basic routing requirements for each type of contact.

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  _____

- Determine what announcements will be played to callers and when they will be played.

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  _____
  _____

- Decide whether different types of contacts will have higher priority than others. If so, identify the levels of priority.

  _____
  _____
  _____
  _____
  _____
  _____
  _____

- Consider the conditional factors that should be used to route contacts. For example, do you want to give a caller the opportunity to leave a voice message after waiting in queue for more than 120 seconds, and do you want to play a different announcement to a caller if more than 20 contacts are already in the queue?

  _____
  _____
  _____
  _____
  _____

Planning Your Business Logic

Your organization's unique business logic determines how contacts of a variety of media types are distributed from a central location, or hub, to the most appropriate remote location, or node, or from one node to another, and how contacts are assigned to users (agents) for handling. Creating your business logic includes performing the following steps in the Business Logic component of the 3Com IPCC Administrator application.

- **Define classifications and classification sets**.
  Classifications are high-level categories of your business logic. For example, you might organize your contact center into three classifications: Sales, Support, and Accounting. You can define different business logic for each classification.

  A contact's classification can be determined in various ways, depending on how your workflows are constructed. For example, a contact's classification might be determined by the e-mail address that a customer uses to send an e-mail message to your contact center, or by the digit that a caller presses on the telephone keypad in response to a voice prompt.

  3Com IPCC Desktop users can have one or more classifications, which are assigned to them in classification sets.

  – For a user who handles contacts, the classification set determines which contacts the user can handle. Each classification in the set has a sequence number. The system attempts to match the user with a contact in the user's primary classification (with the sequence number 1) first, and then with the other classifications in the order specified by their sequence numbers within the classification set.

  – For a user whose role includes the Management feature set, the classification set determines which status views the user can access in 3Com IPCC Real-Time Status Viewer and what classifications the user can monitor.

  The 3Com IP Contact Center system includes a classification named Default, which cannot be deleted. A contact is assigned to the Default classification if it is not assigned to any other classification by the workflow, or if it is assigned to a classification that is not defined in the system. A contact assigned to the Default classification is routed to an agent whose classification set includes the Default classification. For this reason, it is important to assign the Default classification to a classification set and assign that classification set to at least one agent.

What classifications and classification sets do you need to define for your business model?

_____
_____
_____
_____
_____

- **Set hours of operation and holidays for your contact center**. Workflows use this information to route contacts based on whether the contact center is open or closed. You can define different hours-of-operation schedules for each classification or use one schedule for multiple classifications.

  What are your hours and days of operation at each node? Do you have different hours for different classifications?

  _____
  _____
  _____
  _____
  _____

  On which holidays are you closed?

  _____
  _____
  _____
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  _____

- **Define escalation timeouts**.

  When a deferred-assistance contact (e-mail message, voice message, or callback) is escalated, it takes on all the attributes associated with the processing of an immediate-assistance contact and is assigned a priority for ranking with the other immediate-assistance contacts—phone calls and Web collaboration requests.

  Contacts are escalated based on escalation timeouts defined in 3Com IPCC Administrator. You can define a different set of escalation timeouts for each classification or use one set for multiple classifications.

How long do you want each type of deferred-assistance contact to wait before being escalated?

E-mail escalation timeout

_____

Voice message escalation timeout

_____

Callback escalation timeout

_____

- **Define service level objectives**.

  A service level objective represents the percentage of immediate-assistance contacts of a particular media type that should be handled within a specific time threshold. You can define a set of service level objectives for each classification or use the same set for multiple classifications.

  Typically, voice contacts are assigned a service level objective that ensures that an agent answers 80 to 90 percent of them within 30 to 90 seconds. Escalated e-mail, callback requests, and voice messages may have a service level objective that ensures each is responded to within 5 minutes after being escalated. Web collaboration sessions typically require a more immediate service level objective than voice contacts because if requests are not answered immediately, the customer is likely to go to another Web site.

  For each media type you implement, decide on the percentage of contacts that must be handled in a specific amount of time.

  Voice contacts_____% in _____seconds

  Web contacts_____% in _____seconds

  Escalated e-mail contacts_____% in _____seconds

  Escalated voice messages_____% in _____seconds

  Escalated callback contacts_____% in _____seconds

- **Define business attributes**.

  Each contact that arrives in the 3Com IP Contact Center and each agent and node that logs on can be assigned variable, quantitative values—called business attributes—that are used in priority expressions to

determine the priority of the contact or agent, or in a Calculate Attribute workflow step to perform conditional routing.

Business attributes can be system-defined or user-defined. The 3Com IP Contact Center system includes system-defined attributes for user and contact.

- **System-defined user attribute**. There is only one system-defined user attribute, *UserSecsInQueue*, which is the amount of time the agent has waited for a contact. The longer the wait, the higher the value of the attribute.
- **System-defined contact attributes**. The following table lists the system-defined contact attributes.

Name	What it specifies
ContactSecsInQueue	The amount of time (in seconds) that the contact has waited for an agent. Use this attribute to give priority to a contact that has waited in the queue the longest.
ContactSecsInSystem	The amount of time (in seconds) that has passed since the contact was created. Use this attribute to give priority to a contact that has waited in the system the longest.
MediaType	The media type of the contact, weighted on a scale of 1 to 100 as follows: ■ Voice: 100 ■ Web: 50 ■ E-mail: 25 ■ Voice message: 13 ■ Callback: 6 Use this attribute to weight priority based on media type. This is the only system-defined symbolic attribute.
SvcLevelObjective	The amount of time the contact has waited in the queue divided by the time defined for service level objective. For example, a contact that has waited for 40 seconds with a service level time of 60 seconds (40/60) has a higher value for SvcLevelObjective than another contact that has waited for 60 seconds with a service level time of 300 seconds (60/300).

In most cases, the system calculates the value of a business attribute by retrieving data from a database through the use of an SQL query, stored procedure, or Java code.

– **SQL query or stored procedure**. For simple cases, you can write an SQL query. For more complex cases, you can call a stored procedure—a precompiled set of SQL statements stored in a database with a unique name and executed as a unit when called. Only 3Com Support personnel can upload the query or stored procedure call to the central database.

  SQL queries and stored procedures can use the following tokens to be replaced by values at run time: $contactId, $userId, $nodeId, $classifId, $caseId, $customerId. Typically, an SQL query uses a customer-defined data source and accesses a CRM database.

  The call to a stored procedure in the 3Com environment must conform to special rules. Ask your 3Com Support personnel for details.

– **Java code**. The 3Com Support Center will assist you in writing and compiling Java code for a business attribute and uploading the source and class files to the central database.

  Note: *Usually, Java code is used to access a database, but you could create a business attribute whose value is calculated through the use of Java code that does not access data from a database—for example, an attribute that determines the day of the week.*

List user-defined business attributes you might want to define for your contact center. For example, you might define a business attribute named AmountSpent to give priority to customers who have spent the most money.

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Planning for the Configuration of Your Workforce

The Workforce component of the 3Com IPCC Administrator application provides an interface for defining 3Com IPCC users and their capabilities and access privileges. This component also provides an interface for defining Idle reasons and wrap-up codes.

To configure your workforce, be prepared to complete the following tasks.

- **Decide whether to use the default roles or create new ones**.

  A user role is a value assigned to a 3Com IPCC Desktop user that determines the functions to which the user has access. The 3Com IP Contact Center includes four default user roles that you can use, or you can create new roles.

  Each role is constructed from the functionality associated with three or more feature sets: the Common and Desktop feature sets (which provide basic functionality needed by all users) plus one or more additional feature sets. For example, the default Agent user role is constructed from the Common, Desktop, Contact Handling, and Ring-Through feature sets.

  Each feature set consists of core functionality and (except for the System feature set) a group of settings that are configured and saved as a class of service. When you add a user to the system, you assign to that user:

  – A role

  – A class of service for each feature set included in the role

  For example, if you assign the default Agent role to a user, you must also assign to that user a class of service for the Common, Desktop, Contact Handling, and Ring-Through feature sets.

The following table lists and briefly describes the feature sets included in default roles: Agent (A), Supervisor (Sup), Administrator (Admin), and Executive (Exec).

Feature set	Description	Agent	Sup	Admin	Exec
Common	Provides basic functionality of the 3Com IPCC Desktop, including which trunk groups are accessible to the user for outbound calls, which types of routed calls the users can receive, whether the Web application starts automatically, and if the calls waiting indicator is displayed.	X	X	X	X
Desktop	Provides a way to specify which applications are available to the 3Com IPCC Desktop user, whether they are managed applications, and their relative sizes and positions. This feature set can be configured only by a user with technician privileges.	X	X	X	X
Contact Handling	Enables users to perform tasks such as handling contacts, viewing personal statistics, and playing back recordings. **Note**: Users whose roles do not include the Contact Handling feature set (such as the default Executive user role) can stil make outbound calls, make and receive internal voice calls, initiate and participate in internal Web collaboration conferences, and send and receive e-mail messages.	X	X	X	
Ring-Through	Provides a way to specify the type of calls that can be delivered to an agent during each type of immediate-assistance contact and each user state. This feature set is required for roles that include the Contact Handling feature set.	X	X		
Management	Enables users to supervise teams, access 3Com IPCC Real-Time Status Viewer to view statistics for their teams and classifications, and access 3Com IPCC Reporter to view historical reports and send bulletins to supervised users and team supervisors (if enabled in the associated class of service).		X	X	

Feature set	Description	Agent	Sup	Admin	Exec
Application	Provides access to 3Com IPCC Administrator and its features and capabilities; 3Com IPCC Workflow Builder, which provides the interface for building workflows; and all information available through 3Com IPCC Real-Time Status Viewer. This feature set also enables the user to send bulletins to all users, all logged-on administrators, all supervisors, or all members of teams managed by the user.			X	
Strategic	Provides access to 3Com IPCC Reporter for viewing historical reports and to all information available through 3Com IPCC Real-Time Status Viewer.				X

- **Define skills**.

  A skill is an area of agent expertise. Skills should be defined in a way that best suits your contact center. For example, skills might represent the geographic area that your agents cover, products in which your agents have expertise, or languages that your agents speak. Each agent is assigned a set of skills along with a proficiency in each skill (a value between 1 and 100) that represents the agent's level of expertise in the skill. Assigning skills and proficiencies helps ensure that contacts are routed to those agents who can best handle them.

  What skills do you need to define for your contact center?

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  _____
  _____
  _____
  _____

- **Define teams**.

  A team is the set of agents that a supervisor manages. All users who handle contacts must be assigned to a team.

  A user whose role includes the Management feature set can be designated as the supervisor of one or more teams, but users can be contact-handling members of only one team.

A supervisor can supervise and handle contacts for the same team (thus "supervising" himself or herself), or can supervise a team and not belong to any team as a contact-handling member.

A team can have up to five supervisors. Team supervisors can typically do the following:

- Access real-time status views and historical reports for their teams only.
- Monitor, coach, and barge in on agents who are members of the team they supervise (if authorized to do so by their assigned class of service).
- Log off agents who are members of the team they supervise.
- Receive notification when a user clicks the Emergency button on the 3Com IPCC Desktop toolbar.

What teams do you need to define for your contact center?

_____
_____
_____
_____
_____

- **Define users**.

Everyone in your organization who uses the 3Com IP Contact Center system must be defined as a user. When you define a user, you assign a logon name and temporary password for logging on to the 3Com IPCC Desktop. You also assign the following to each user:

- A user **role**—one of the five default roles or a custom-defined role.
- A **class of service** for each feature set. A class of service consists of settings that are associated with a feature set. For example, the class of service for the Contact Handling feature set determines, among other things, whether the auto-answer feature is turned on.
- For users who handle contacts, a **team**.
- For users whose roles include the Contact Handling or Management feature set, a **classification set**.
- One or more **skills** (relevant only for users whose roles include the Contact Handling feature set) and a preference and proficiency in each skill.

List each agent in your contact center along with the team he or she will be assigned to, the supervisors of the team, the classification set that should be assigned to the agent, the agent's skills, and the agent's proficiency in each skill.

Name	Team/Supervisors	Classification set	Skills and proficiency (1-100)

Who will fill the administrative and executive roles in your contact center?

_____

_____

- **Define Idle reasons**.

  When an agent submits a request to be placed in the Idle state, he or she must select a reason from a menu on the 3Com IPCC Desktop. This information becomes available in real-time status views and historical reports that track agent activity, enabling your contact center to track the reason agents are unavailable to handle contacts. For example, your contact center's list of Idle reasons might include lunch, break, meeting, and personal.

  Idle reasons also become available to the workflow and can be used to make decisions regarding whether to allow or deny the agent's request to be placed in the Idle state.

  List the Idle reasons you will use at your contact center.

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  _____

- **Define wrap-up codes**.

  A wrap-up code is a text string that agents can select during or immediately after a contact to identify information about the transaction, such as why the person called or how a problem was resolved.

  Wrap-up codes enable your organization to collect data about contacts and their resolution for later analysis. For example, if you ask agents to enter a code for a special promotion, you can determine the extent to which the special promotion increased the amount of traffic to the 3Com IP Contact Center.

  In order for your organization to use this feature, the Wrap Up step in agent workflows must be configured to prompt agents to enter a wrap-up code after handling an immediate-assistance contact.

You define wrap-up codes in 3Com IPCC Administrator's Workforce component. For example, if your organization handles sales queries, you might define codes specifying how the caller heard about your company, such as tv, radio, newspaper, web, friend, or other. The codes you define appear on a list available to agents from the contact panel on the 3Com IPCC Desktop.

Should agents enter wrap-up codes after calls? Yes/No

List the wrap-up codes you need to define. There is no limit to the number of wrap-up codes you can define; however, to ensure ease of use, 3Com recommends that you define no more than 25.

_____
_____
_____
_____
_____
_____
_____

Planning for E-mail Management

To plan for e-mail management implementation, 3Com recommends that you write a detailed description of your current process for handling e-mail. This will help your implementation team to configure e-mail management for your business.

To collect this information, interview individuals in your contact center who fill the standard contact center roles (agents, supervisors, administrators, and executives). Be sure to interview representatives from every department that will use the e-mail management system.

The following questions will help you gather the information you need.

- How does your organization currently handle e-mail?

_____
_____
_____
_____

- What is the current e-mail system architecture?

  _____
  _____
  _____
  _____

- What e-mail aliases, if any, do you use?

  _____
  _____

- What e-mail addresses will you be routing to the 3Com IP Contact Center (for example, support@xyz.com, sales@xyz.com)?

  _____
  _____
  _____
  _____
  _____

- What Web forms will route e-mail to the 3Com IP Contact Center?

  _____
  _____
  _____

- Does a single mailbox take all your e-mail messages?

  _____
  _____
  _____

- How do staff members monitor the mailbox?

  _____
  _____
  _____
  _____

- How many individuals currently handle these e-mail messages?

  _____
  _____
  _____

- How is ownership of an e-mail message determined?

  _____
  _____
  _____
  _____

- Do you route e-mail messages based on any keyword searches in e-mail subject lines or body text?

  _____
  _____
  _____
  _____

- Do you have a process for escalating e-mail messages?

  _____
  _____
  _____

- What is your process for tracking e-mail messages to verify that they have been answered?

  _____
  _____
  _____
  _____

- Do your agents have access to standard templates for answering e-mail?

  _____
  _____
  _____

- Do you have a process for automatically acknowledging an incoming e-mail message?

  _____
  _____
  _____
  _____

- Do responses to e-mail require approval before being sent?

  _____
  _____
  _____
  _____

- What is your process flow for handling e-mail?

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  _____
  _____
  _____

- What types of e-mail messages do you receive regularly?

  _____
  _____
  _____
  _____

- Are e-mail messages routed to a specific individual for answering? What happens if that individual is unavailable?

  _____
  _____
  _____
  _____

- Do you ever receive e-mail messages that should have been sent to another group?

  _____
  _____
  _____
  _____

- When your department is closed, where should e-mail messages be routed?

  _____
  _____
  _____
  _____

Planning for Web Collaboration

Web collaboration enables your agents to interact with customers (referred to as callers) over the Web by sharing Web pages, forms, and text chat. An agent can optionally talk with a customer on the phone during a Web collaboration session.

Typically, a caller requests a Web collaboration session by clicking a button on your Web site, entering information on a form, and selecting the type of help or information needed from a drop-down list. The caller then clicks a submit button and is routed to an appropriate agent according to your organization's business logic. While the call is being routed, a message appears in the caller's browser window indicating that an agent will be available shortly.

A meet-me session is a Web collaboration session established directly with a particular agent. Typically, the agent instructs the caller—with whom the agent is connected by phone—to go to a particular Web page, enter the agent's logon name and meet-me ID (a unique code that is assigned when the agent logs on to the 3Com IPCC Desktop), and click a submit button. The caller is then connected directly to that agent.

Your 3Com implementation team will work with you to develop the overall operation of the interaction between agents and visitors to your Web site.

This section provides guidelines to help you plan for Web collaboration:

Designing the Launch Pages

A Web collaboration session is initiated when an HTTP GET or PUT request is made to the Collaboration Application Server of the form:

- action=http://jetty-hostname/Collab/servlet/ValidateACD (for a routed Web collaboration request)
- action=http://jetty-hostname/Collab/servlet/ValidateMeetMe (for a meet-me request)

A routed Web collaboration request is usually accompanied by workflow parameters preset in a link on your Web site or through a form element in a Web page.

A meet-me request is accompanied by TO and PC parameters set to the target agent's logon name and current meet-me ID. These parameters are set through a form element in a Web page.

If a form is used, the page can reside either on the 3Com IPCC Web Collaboration server as a Java Server Page (JSP) or as a page on any other accessible Web server. A benefit of having the form on a JSP on the Web Collaboration server is that access to the lists of classifications and skills is provided through a JavaBean (a reusable software component). These lists are not available programmatically otherwise and must be hard-coded in the page.

The page from which the Web collaboration session is invoked becomes the caller's page-sharing window, so care should be taken to ensure its size and decorations are reasonable for normal Web browsing.

The following form parameters can be used by the workflow to help route a Web collaboration request, provide information to your CRM application, or display additional information in the agent's 3Com IPCC Web Collaboration window or contact panel. Although all parameters are optional, the Web workflows need to accommodate appropriately when the CLASSIFICATION parameter is not set.

Parameter	What it should store	How it is used
CALLERNAME	The caller's full name.	Displayed in the caller information panel of the agent's 3Com IPCC Web Collaboration window. If this parameter is not provided or is left blank, N/A is displayed.
PHONENUMBER	The caller's phone number.	Displayed in the caller information panel of the agent's 3Com IPCC Web Collaboration window. The agent can click this number to initiate a phone call to the caller. If this parameter is not provided or is left blank, N/A is displayed.
CALLEREMAILADDRESS	The caller's e-mail address.	Displayed in the caller information panel of the agent's 3Com IPCC Web Collaboration window. A copy of the session transcript is sent to the e-mail address if supplied. If this parameter is not provided or is left blank, N/A is displayed.
CASEID	The caller's case ID.	Can be used by the workflow to route the call or display an appropriate CRM screen on the agent's desktop.
CUSTOMERID	The caller's customer ID.	If this paramter is set, the value is displayed in the contact panel in the agent's 3Com IPCC Desktop Manager window.
CLASSIFICATION	The classification for the caller's request. The values that the caller can choose from or the hard-coded value must match the values defined in the system.	Can be used by the workflow to route the call. The value is displayed in the contact panel in the agent's 3Com IPCC Desktop Manager window.

Parameter	What it should store	How it is used
TEXT	Text entered by the customer such as a question or problem description.	Can be used by the workflow.
TO	The full URL of the reference page - the page that served as the access point for the Web collaboration request.	Use of this parameter depends on how the Web pages and workflows are configured. The example LaunchCaller JSP extracts this parameter from the HTTP Referrer parameters.
USER1 - USER10	Optional parameters defined by your system implementer.	Depends on how the Web page and workflows are configured.

Defining Web Sources

Define the needed text and URL Web sources. A text Web source displays text in the caller's chat window. A URL Web source displays a Web page in the caller's and agent's browser.

The following text Web sources are needed.

Web source	Default	Preferred text
Closed	The contact center is currently closed. Please try again later.	
ConnectionLost	We are currently experiencing technical difficulties and have lost connection with the user. Please wait to be reconnected.	
ConnectionRecovered	We are now connecting you back to the original agent.	
ConnectionTimedOut	The original agent is no longer available. We will try and connect you to a different agent. Please be patient.	
Goodbye	Thank you for visiting us.	
UserNotAvailable	This user is currently unavailable. Please try again later.	
Welcome	Welcome! How can we help you?	

The following URL Web sources are needed.

Web source	Description	URL
ClosedURL	Page to display when the contact center is closed.	
GoodbyeURL	Page to display when the session is ended.	
WelcomeURL	Page that welcomes the caller.	

Obtaining a Web Server Certificate

If you plan to use 3Com IPCC Web Collaboration to share Web pages that are protected through HTTPS, you must establish yourself as a client of a certificate authority (CA) to obtain a Web server certificate. A CA is a reliable third party that issues digital certificates used to create digital signatures between two parties. A CA confirms and guarantees the identity of a user, which is critical for data security and electronic commerce.

The Collaboration System is preconfigured with a sample certificate that should be used only for testing because browsers will not trust this certificate and will display a message telling users that the certificate was not issued by a trusted CA. If you will never share HTTPS pages, the sample certificate can be left in place.

Your 3Com implementation team will work with you to obtain and install a certificate on the Web collaboration server in the 3Com IP Contact Center system.

3Com neither recommends nor requires Verisign as a CA. However, if you want additional background on certificates and enrollment procedures, you can visit the following Web site:

http://www.verisign.com/support/site/secure/eguide.html

Developing Pages for Sharing

Following are some important points to keep in mind when you develop Web pages for use in Web collaboration sessions. Be sure to train agents to share only those pages that follow the guidelines provided here.

- Keep page sizes small for fast downloading.

  Participants are likely to become frustrated or confused if you subject them to long download times. What bandwidth do you expect your callers to have? Will some connect over slow dial-up modems? Be aware that in a conference session, participants can experience different download times. Design your pages with speed in mind.

- Design pages that are short, simple, and easy to scan.

  Remember that participants must divide their attention between the page you are sharing and the text chat or phone conversation with you. Avoid large blocks of text on shared pages. Use subheads, bulleted lists, short paragraphs, and simple graphics to illustrate your points. Avoid long pages that require scrolling or that use anchors to navigate within a long page.

- Display all shared pages in a single browser window. Page sharing is not supported in pop-up browser windows.

- Do not attempt to share frame-proofed pages.

  A frame-proofed page is one that cannot be viewed inside another application's frame. Frame-proofing is often achieved through use of a JavaScript function.

- Avoid sharing pages that include the following:

  – Dynamic HTML (DHTML) or any other browser-specific content. Results will vary depending on the participant browsers.

  – Applets, video clips, PDF files, or any other content that requires a helper application. After such applications are loaded in the participant browsers, they will not be synchronized.

  – Content from different domains on the same page.

- Test the pages you plan to share on all supported browsers and on computers with different screen resolutions and color settings.

  Different browsers display content differently. In addition to differences in technology among different browsers (for example, how they render HTML), you must also consider differences in color settings, screen resolution, and fonts available on the computers your participants use to view your content. Adjust your design to accommodate the differences you observe during testing.

Planning for Voice Support

To plan for voice support, you need to consider the following preparation tasks, which will be discussed during your Kickoff and Discovery Meetings.

- Acquire the hardware and software and construe the networking requirements listed in "Hardware, Software, and Network Requirements" on page 13.
- Determine your dialing plan.
  - Prepare to assign an access code that will precede the extension number for calls to extensions on your company's PBX. For example, 9 is used as the access code by most PBXs. The same access code can be used for all outbound calls as well.

    Make sure that the access code is not the same digit as the first digit of any of your company's PBX extensions.
  - What will be the treatment of different types of outgoing calls?

    _____
    _____
    _____
    _____
    _____
    _____
    _____

  - List the DNIS and DID numbers that will be used to route calls in your system.

    _____
    _____
    _____
    _____
    _____
    _____
    _____
    _____

- Will Automatic Number Identification (ANI) be used to route calls? Yes/No _____

- What DNIS digits will trigger workflows?

  _____
  _____
  _____
  _____
  _____
  _____
  _____

- Identify recorded greetings and announcements appropriate for your voice system (for example, initial greeting and menu choices and waiting-in-queue announcements).

  _____
  _____
  _____
  _____
  _____
  _____

- Decide what callers will hear if they contact your voice system outside of regular business hours.

  _____
  _____
  _____
  _____
  _____
  _____
  _____
  _____
  _____

- How long you want customers to hold before giving them the option to leave a voice message.

  _____

- Will customers enter an account ID, case ID, customer ID, or ticket number?

  _____
  _____

- If you need outbound dialing from agent phones, determine how many outbound lines you will need and make sure you have the appropriate number of ports on both the analog gateway and your PBX. For more information, see "Networking Protocols" on page 19.

  _____
  _____
  _____

- Do you plan to use T1 spans or PRI spans?

  _____
  _____

- If you are connecting to a PBX, what type of signaling do you plan to use?

  _____
  _____

- Do you plan to connect the 3Com IP Contact Center to any IVR/VRU systems? If so, what type of signaling do you plan to use?

  _____
  _____

Planning for CRM Integration

To prepare for CRM integration, answer the following questions.

- Do you have more than one CRM database? List them.

  _____
  _____
  _____
  _____

- Is your CRM client Web-based?

  _____

- Do you currently have stored procedures?

  _____
  _____

- Do you currently use data-directed routing?

  _____
  _____
  _____

- Do you currently use screen pops?

  _____
  _____
  _____

Glossary

3Com IP Contact Center. A distributed, networked system that provides the infrastructure and functionality associated with receiving, processing, and delivering contacts of a variety of media types, including voice, e-mail, Web, callback, and voice message. Contacts are distributed from any location (the hub or a node) to the most appropriate remote location (a node) where they are handled by agents. See also *hub*, *node*.

3Com IPCC Administrator. The application used by administrators to provision, configure, and manage the 3Com IP Contact Center.

3Com IP Contact Center. See *3Com IP Contact Center*.

3Com IPCC E-mail Manager. The 3Com e-mail server or server process running at any hub or node. See also *hub*, *node*.

3Com IPCC Web Collaboration. The application used by agents to share information with customers over the Web while communicating with them by typing text in a chat window or talking on the phone.

3Com IPCC Workflow Builder. An application used to create instructions for the processing and delivery of contacts, the management of agents, and the general control of system-level behaviors.

agent. A person who handles contacts and interacts with customers, other agents, and other people in the agent's organization. Synonymous with customer service representative.

Automatic Number Identification (ANI). A service provided by the telephone company that delivers the originating number of the caller. This number can be used as a key to route the call and retrieve information about the caller from a database.

business attribute. An entity associated with a contact or agent that can be used in a priority expression or a Calculate Attribute workflow step to prioritize contacts or agents or to perform conditional routing. MediaType (the media type of a contact) and ContactSecssInQueue (the number of seconds a contact has waited in the queue) are examples of business attributes. See also *conditional routing*, *priority expression*, *workflow*.

channel service unit (CSU). A device installed at the customer site that provides an interface to a T1 line. A CSU contains circuitry that allows the central office (CO) to perform diagnostic tests remotely.

chat. A form of real-time, online communication that allows each participant to type messages on a computer keyboard and have the text appear instantaneously on the other participants' screens.

classification. A high-level category into which contacts and agents are placed, such as Sales, Support, and Human Resources.

conditional routing. The routing of a contact based on the evaluation of some condition, such as current contact center traffic or the importance of the current contact to the organization. For example, a contact might be put in a queue to wait for an agent or prompted to leave a voice message, depending on the number of contacts waiting for an agent, or a contact might be routed to a particular agent if that contact is considered very important to the organization.

contact. The event of a customer connecting to your contact center.

cookie. A block of data given to a Web browser by a Web server. The browser sends the data back to the server each time it requests a page from the server. Cookies can contain information such as log-on data and user preferences.

Customer Relationship Management (CRM). Enterprise-wide software and methodologies that help an organization manage every aspect of its relationship with a customer. A CRM solution typically includes a database that stores all information related to a customer's contact with the organization.

deferred assistance. One of three levels of assistance provided by the 3Com IP Contact Center. Deferred assistance is for customers who need live assistance but are willing to wait. Because these customers expect a response within a finite period of time, automatic escalation to immediate assistance ensures that their expectations are met in an effective and timely manner. Deferred assistance contacts include callback requests, e mail messages, and voice mail messages. Contrast with immediate assistance, self-service.

demoted contact. A voice contact whose level of assistance has been moved from immediate to deferred or self-service. A voice contact is demoted to deferred assistance when a caller chooses to leave a voice message instead of waiting for an agent. A voice contact can be demoted to self-service when an informational announcement provides the information the caller needs and no follow-up is required.

DID. See *Direct Inward Dialing (DID).*

Direct Inward Dialing (DID). A feature, available over specially configured trunks (known as DID trunks), that passes some or all digits of the dialed number to the PBX or other switch, which can use these digits to determine how to route the call. DID calls are not processed by the 3Com IP Contact Center system: they are internal calls placed from one user to another or external calls placed by a customer directly to an agent's extension. See also *Private Branch Exchange (PBX)*.

Dialed Number Identification Service (DNIS). A service provided by the telephone company that delivers a user-specified digit string indicating the number a customer dialed along with delivery of the call. The DNIS number can be used to determine appropriate routing for the call.

DNIS. See *Dialed Number Identification Service (DNIS)*.

DNS. See *Domain Name Service (or System) (DNS)*.

Domain Name Service (or System) (DNS). An Internet service that maps user-friendly (symbolic) names to domain resources or information (such as IP addresses, mail exchanges, and domain names). A familiar use of DNS is to map a host name such as www.company.com to an IP address such as 123.254.12.45.

firewall. A security system that blocks unwanted access to a protected network.

Ganglia. Ganglia is a scalable distributed monitoring system for high-performance computing systems such as clusters and grids.

hub. The centralized component of the 3Com IP Contact Center. The hub is the location of the central database that contains global information about the 3Com IP Contact Center. The hub also contains the central e-mail and Web collaboration software. Like a node, the hub can accept and distribute contacts to the most appropriate agents across the system. See also *node*.

If Open step. A workflow step that, in an immediate-assistance workflow, determines whether the classification assigned to a contact is open at the node where the workflow is running. In a user workflow, the If step determines whether at least one classification assigned to the user is open at the node where the user workflow is running. See also *immediate assistance*, *node*, *workflow*.

immediate assistance. One of three levels of assistance provided by the 3Com IP Contact Center. Immediate assistance is for customers who require live assistance as soon as possible. Immediate-assistance contacts include Web collaboration requests, phone calls, and escalated e-mail messages, voice messages, and callback requests. Contrast with immediate assistance, self-service.

ISDN. Integrated Services Digital Network, an international telecommunications standard that provides a method for the high speed transmission of voice, video, and data over digital phone lines. ISDN uses circuit-switched B (bearer) channels for voice and data and a separate D (delta) channel for signaling and control. There are two basic types of ISDN service: Basic Rate Interface (BRI) and Primary Rate Interface (PRI). See also *Primary Rate Interface (PRI)*.

IP address. Internet Protocol address. An identifier for a computer or device on a TCP/IP network.

Java Plug-in 1.4.0_01 (Java 2 Runtime Environment [JRE]). A software product from Sun Microsystems that enables your Web browser to run some 3Com IPCC applications.

media type. The means by which a contact arrives at the contact center. Media types include voice, e-mail, Web, callback, and voice message.

Microsoft Outlook Express. The application used by agents and supervisors to handle deferred-assistance contacts, including e-mail inquiries from customers, callback requests, and voice messages. See also *deferred assistance*.

Nagios. Nagios is an open source system and network monitoring application. It watches hosts and services that you specify, alerting you when things go bad and when they get better.

network interface card (NIC). A circuit board that is installed in a computer so the computer can be connected to a network.

node. The local component of the 3Com IP Contact Center's distributed architecture. The node uses predefined business logic to accept contacts and distribute contacts to the most appropriate agents across the system. See also *hub*.

PBX. See *Private Branch Exchange (PBX)*.

Primary Rate Interface (PRI). A type of ISDN connection that, in North America, provides 24 channels, divided into 23 B (bearer) channels for message information and one D (delta) channel for signaling and control, running at 1.544 megabits per second. See also *ISDN*.

Private Branch Exchange (PBX). A privately owned telephone system used within an enterprise and located on the premises. The PBX provides inside telephone connectivity and allows all users to share a certain number of external telephone lines.

priority. A value between 0 and 100 that represents the weighted sum of evaluated priority expressions. The higher the value, the more important the agent or contact.

priority expression. An expression that relates together business attributes, each with an appropriate weighting, to calculate the current ranking of contacts, agents, or nodes within a classification. See also *business attribute*, *classification*.

proficiency. A value between 1 and 100 that represents an agent's level of expertise in a specific skill. See also *skill*.

PSTN. See *public switched telephone network (PSTN)*.

public switched telephone network (PSTN). The interconnected collection of local, long-distance, and international phone companies accessible to anyone with a phone.

role. A value assigned to a 3Com IPCC Desktop user that determines the functions to which the user has access. A role is constructed from the functionality associated with three or more core feature sets: the Common and Desktop feature sets (which provide basic functionality) plus one or more additional feature sets. The system includes several default user roles that can be used as the basis for customized roles.

self-service. One of three levels of assistance provided by the 3Com IP Contact Center. Self-service is for customers who want to get information themselves while maintaining the option of being escalated to deferred or immediate assistance to complete their transactions. Self-service contacts include phone inquiries that are satisfied by informational announcements and Web contacts in which customers view information posted on a Web site.

service level objective. The percentage of contacts of a particular media type within a particular classification that must be handled in a specific amount of time. See also *classification*.

skill. An area of agent expertise. Skills can be defined any way that best suits the contact center. For example, skills might represent the geographic areas that agents cover, or product areas in which agents are knowledgeable, or languages that agents speak. Each agent is assigned a set of skills along with a proficiency in each skill-a value between 1 and 100-that represents the agent's level of expertise in the skill.

stored procedure. A precompiled set of SQL statements stored in a database with a unique name and executed as a unit when called from an application.

TCP/IP. The Transmission Control Protocol (TCP) on top of the Internet Protocol (IP). These two protocols were developed to allow communication between groups of dissimilar computer systems from a variety of vendors. IP is the specification responsible for moving packets of data between nodes. TCP is responsible for making sure that packets arrive correctly at their destination.

UDP. User Datagram Protocol, the connectionless protocol for data transfer that is part of the TCP/IP suite of protocols. Unlike TCP, UDP does not guarantee receipt of the data by the remote computer.

uninterruptible power supply (UPS). A device providing a continuous source of electrical energy to a piece of equipment.

user role. See *role*.

WAV. A sound file format. Files stored in WAV format have a .wav file name extension.

Web collaboration. See *3Com IPCC Web Collaboration*.

workflow. A set of instructions for the processing and delivery of contacts, the management of agents, and the general control of system-level behaviors. Each instruction in the workflow is referred to as a step.

Workflow Builder. See *3Com IPCC Workflow Builder*.