



3Com[®] eXchange Call Center Hardware and Software Guidelines

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CONTENTS

ABOUT THIS GUIDE 5

- Documentation Conventions 5
 - Related Documentation 6
 - Documentation Comments 6
 - Registration, Warranty, and Support Information 7
 - Disclaimers 7
-

CHAPTER 1: OVERVIEW OF SOFTWARE REQUIREMENTS 9

- Remote Access 9
 - Power Source 9
 - Redundancy 9
 - Installation and Configuration Instructions 9
 - 3Com eXchange Call Center License Key Codes 10
-

CHAPTER 2: CALL CENTER SERVERS 11

- Basic Call Center System — Up to 20 Agents 11
 - Mid Level Call Center System - 20 to 50 Agents 12
 - Advanced Call Center System - 50 to 90 Agents 13
 - Processors and Memory 13
 - NBX Systems Server, Normal Load 14
 - Additional Resources for TAPI Wav Ports (Wav Phones) 14
 - Examples 14
-

CHAPTER 3: REQUIREMENTS FOR EXCHANGE CALL CENTER CLIENTS 17

- Hardware and Software Requirements 17
-

APPENDIX A: CALCULATING THE NUMBER OF IVR PORTS 19

- Guidelines for IVR Port Calculation 19
- Terms Used in the Calculations 19
- IVR Ports on eXchange Call Center Systems 20

ABOUT THIS GUIDE

This guide describes hardware and software requirements for the 3Com eXchange Call Center servers and desktops integrated with the 3Com NBX IP Telephony solutions. The guide details the minimum requirements and lists the supported platforms, possible configurations, basic software requirements, and recommendations for calculating the number of needed IVR ports.

This document is intended for 3Com Professional Service engineers, customer technical personnel, and 3Com Voice Partners to help to identify customer needs and provide the appropriate configuration for required features and solutions.

The intended audience is the technician who is familiar with the 3Com NBX and eXchange Call Center architecture and features.






For information regarding the 3Com eXchange Call Center Agent and Visor applications, see the Help for each screen. For a description of many of the eXchange Call Center concepts and terms, see the Glossary in the Agent and Visor User Guides.

Documentation Conventions

Table 1 lists conventions that are used throughout this guide.

Table 1 Notice Icons

Icon	Notice Type	Description
	Information note	Information that describes important features or instructions
	Caution	Information that alerts you to potential loss of data or potential damage to an application, device, system, or network
	Warning	Information that alerts you to potential personal injury or death

Related Documentation

The following documents are available on the 3Com Partner Access website for the 3Com eXchange Call Center system:

- *3Com eXchange Call Center Hardware and Software Guidelines* (this guide)
- *3Com eXchange Call Center Quick Installation Guide*
- *3Com eXchange Call Center Installation and Getting Started Guide*
- *3Com eXchange Call Center Visor User Guide*
- *3Com eXchange Call Center Administration Guide*
- *3Com eXchange Call Center Agent User Guide*
- *The context-sensitive Help topics for each application*

This guide is organized as follows:

Chapter 1:	Overview of Software Requirements
Chapter 2:	Call Center Servers
Chapter 3:	Requirements for eXchange Call Center Clients
Appendix A	Calculating the Number of IVR Ports

Documentation Comments

Your suggestions are important to us because we want to make our documentation more useful to you.

Please send e-mail comments about this guide or any of the eXchange Call Center documentation and Help topics to:

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Please include the following information with your comments:

- Document title
- Document part number (usually found on the front page)
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Part Number 900-0148-01 Rev AA
Page 25

Registration, Warranty, and Support Information

For details on how to register your product and get support from 3Com, see the Appendix “Obtaining Support for Your 3Com Product” in the *3Com eXchange Call Center Installation Guide*.

Disclaimers

The illustrations and other views, telephone displays, and screen captures appearing in this manual are examples used to explain how the application’s features and controls are used. What appears in the illustrations may differ from what appears on your actual equipment and may not represent something that is possible in actual operation. The functions that you can use and the information that you can display may differ depending on the telephony state and external equipment connected in your network and 3Com eXchange Call Center system. Therefore, use the illustrations only as guidelines.

The names of companies, products, people, characters, and data mentioned in the examples herein are fictitious and are in no way intended to represent any real individual, company, product, or event, unless otherwise noted.

CHAPTER 1: OVERVIEW OF SOFTWARE REQUIREMENTS

The 3Com eXchange Call Center is integrated with the NBX networked telephony solution to perform real-time operation of the Call Center activities. The use of tested and certified hardware and software configurations is crucial to provide proper reliability, maximize system uptime, and minimize improper activity or malfunctions at the customer site.

The rest of this chapter describes requirements and configurations that take into consideration normal loads and activity of the Call Center.



The maximum eXchange Call Center call load and activity (including IVR activity) must not exceed 90 concurrent agents or 2000 calls per hour.

Remote Access

As with other real-time critical systems such as PBXs, the 3Com eXchange Call Center configurations require remote access capabilities so that your 3Com Professional Services representatives can provide online maintenance and support. For remote access capability, use an external modem with Symantec's PcAnywhere software or another remote-support application.

Power Source

It is the installer's responsibility to verify that the Call Center Server has a protected power source, either from an online UPS or from a protected power supply at the site.

Redundancy

3Com eXchange Call Center applications support redundancy of critical hardware components at the Server. Redundancy of hard drives and power supplies is recommended for minimizing down time and improving the recovery process in case of hardware failures.

Installation and Configuration Instructions

For detailed installation and configuration procedures for the Call Center, see the *3Com eXchange Call Center Installation and Getting Started Guide*.

3Com eXchange Call Center License Key Codes

The basic and optional Call Center license key codes are implemented by attaching hardware lock devices called “dongles” to the parallel port on each Visor PC (for the Visor license) or the USB port on the Server computer for the eXchange server and other licenses.

When you purchase a 3Com eXchange Call Center, 3Com ships a USB port lock device for the Server and a parallel port lock device for each eXchange Visor that you ordered.

The basic Call Center includes 10 Agents. When you buy additional Agent licenses in increments of 5 agents, 3Com sends you the license key code in an e-mail message. When you store the keycode file on the Server, the system upgrades your system software and the Server dongle and then deletes the file.

Other optional key codes include the Wall Board license and the Reader Board license.

See your 3Com Voice-Authorized Partner for ordering details.

CHAPTER 2: CALL CENTER SERVERS

The 3Com Call Center Server is a dedicated computer that is installed at the customer site and attached to the organization's network. The following requirements of hardware and software configurations are based on lab benchmarks, field beta tests, and knowledge gained from customer sites.

The following servers are currently supported for 3Com eXchange Call Center installations:

- IBM Server Z Pro Series

Based on the type of 3Com eXchange Call Center application and the number of Agents that you want, choose one of the three levels of server configurations described in this section.

The configuration tables define *minimal* requirements for the eXchange Call Center Server. All of the listed components for your Server should conform to these requirements.

Basic Call Center System — Up to 20 Agents

Category	Description
Intel Pentium III or Pentium 4 processor (for the Call Center Server)	See Processors and Memory_later in this chapter.
Additional processor	As required
Memory	See Processors and Memory_later in this chapter.
First hard drive	20GB 7.2K RPM IDE
Diskette drive	3.5 in., 1.44MB Diskette Drive
CD-ROM drive	Required
Keyboard, Monitor, Mouse	Required
First Network Adapter	Required (TCP/IP)
Second Network Adapter	Required (TCP/IP)
Serial Port #1	Required (External Modem)
Serial Port #2	Optional third-party Wall Boards
USB port	Required for Server License lock device (dongle)
Sound card	Required for NBX systems
External modem	Required. 56K or faster

Operating system	Windows 2000 Server (4GB System partition)
Remote Support Application	Symantec's pcAnywhere (current Version 10) or other similar remote-management application such as WebEx application

Mid Level Call Center System - 20 to 50 Agents

Category	Description
Intel Pentium III or Pentium 4 Processor (Server)	See Processors and Memory later in this chapter.
Additional Processor	As required
Memory	See Processors and Memory later in this chapter.
First Hard Drive (All drives must match for RAID.)	18GB, U160, SCSI, 1 in., 10K RPM HDD
Second Hard Drive (All drives must match for RAID.)	18GB, U160, SCSI, 1 in., 10K RPM HDD
Hard Drive Redundancy	Required. Add-In RAID card, Raid 1
Diskette Drive	3.5 in., 1.44MB Diskette Drive
CD ROM drive	Required
Keyboard	Standard Windows keyboard
Monitor	Required
Mouse	Required
First Network Adapter	Required (TCP/IP)
Second Network Adapter	Required (TCP/IP)
Serial Port #1	Required (External Modem)
Serial Port #2	Optional third-party Wall Boards
USB Port	Required for the Server License Lock Device Dongle
Sound card	Required for NBX systems
External Modem	Required. 56K or greater
Operating System	Windows 2000 Server (4GB System partition)
Remote Support Application	Symantec's pcAnywhere application (current Version 10) or other similar remote-management application such as WebEx application

Advanced Call Center System - 50 to 90 Agents

Category	Description
Pentium III or Pentium 4 Processor (Server)	See Processors and Memory_later in this chapter
Additional Processor	As required.
Memory	See Processors and Memory_later in this chapter
First Hard Drive (All drives must match for RAID.)	18GB, U160, SCSI, 1 in. 10K HDD
Second Hard Drive (All drives must match for RAID.)	18GB, U160, SCSI, 1 in. 10K RPM HDD
Third Hard Drive (All drives must match for RAID.)	18GB, U160, SCSI, 1 in. 10K RPM HDD
Hard Drive Redundancy	Drives attached to PERC3-DI, RAID 5
Backplane	1X6 Hot-Pluggable HDD Backplane
Diskette drive	3.5 in., 1.44MB Floppy Drive
CD ROM drive	Required
Keyboard, Monitor, Mouse	Required
First Network Adapter	Required (TCP/IP)
Second Network Adapter	Required (TCP/IP)
Serial Port #1	Required (External Modem)
Serial Port #2	Optional for third-party Wall Boards
USB Port	Required for Server License Lock Device (Dongle)
Sound card	for NBX systems
Power Supply Kit	Redundant Power Supply 2+1
External Modem	Required. 56K or higher
Operating system	Windows 2000 Server (4GB System partition)
Remote Support Application	Symantec's pcAnywhere application (Current Version 10) or other similar remote-management application such as WebEx application

Processors and Memory

Computing requirements for the server and the processor (CPU), and the frequency and amount of memory (RAM), are affected by basic software (mainly, the operating system), the number of Call Center applications, and the IVR port requirements on resources.

For configurations that include the Dual CPU, calculate the total frequency of the system with this formula:

$$(\text{CPU\#1_frequency} + \text{CPU\#2_frequency}) \text{ times } 0.8$$

The following tables summarize the requirements of computing resources.

NBX Systems Server, Normal Load

Agents	Minimum CPU (MHz) on the Pentium III and Pentium 4 Processors	Minimum RAM (MB) on the Pentium III and Pentium 4 Processors
1 to 19	500	950
20 to 50	650	950
50 to 90	1000	1100

Additional Resources for TAPI Wav Ports (Wav Phones)

The following table details the additional resources required for TAPI Wave ports, based on 3Com's requirements for Media Driver resources. See Appendix A for additional information about calculating the number of IVR ports based on the number of trunks.

Number of Ports	Pentium 3 CPU (MHz)	Pentium 4 CPU (MHz)	RAM (MB)
1	25	50	1.1
2	50	100	2.2
4	100	200	4.4
8	200	400	8.8
16	400	800	17.6
32	800	1600	35.2
45	1025	2250	49.5

Examples

- 1 On a site with 10 Agents and 6 TAPI Wave (IVR) ports:

Calculate the Pentium III CPU frequency and RAM as follows:

$$\text{CPU Required} = 500 + (6 * 25) = 650 \text{ MHz}$$

$$\text{RAM Required} = 950 + (6 * 1.1) = 956.6 \text{ MB}$$

Round the CPU and RAM results up to the closest configuration available on the market.

Calculate the Pentium 4 CPU frequency and RAM as follows:

$$\text{CPU Required} = 500 + (6 * 50) = 800 \text{ MHz}$$

$$\text{RAM Required} = 950 + (6 * 1.1) = 956.6 \text{ MB}$$

Round the CPU and RAM results up to the closest configuration available.

- 2** On a site with 45 Agents and 24 TAPI Wave ports (IVR ports):

Calculate the Pentium 3 CPU and RAM as follows:

$$\text{CPU Required} = 650 + (24 * 25) = 1550 \text{ MHz}$$

$$\text{RAM Required} = 950 + (24 * 1.1) = 976.4 \text{ MB}$$

Round the CPU and RAM results up to the closest configuration available on market.

Calculate the Pentium 4 CPU frequency and RAM as follows:

$$\text{CPU Required} = 650 + (24 * 50) = 1850 \text{ MHz}$$

$$\text{RAM Required} = 950 + (24 * 1.1) = 976.4 \text{ MB}$$

Round the CPU and RAM results up to the closest configuration available.

CHAPTER 3: REQUIREMENTS FOR EXCHANGE CALL CENTER CLIENTS

Following the instructions in the *Quick Installation Guide* and the *Installation and Getting Started Guide*, you will install the Call Center Client applications, eXchange Visor (the supervisor package), and the eXchange Agent (the agent application) on the company's PCs in conjunction with other end-user software applications. This chapter describes the system requirements.

Hardware and Software Requirements

The next table lists the requirements for hardware and software configurations assuming that other applications that are running on the same computer do not require large amounts of CPU and RAM resources.

For special applications that have significant requirements for resources, ask the IT department on site to reevaluate the CPU and RAM amounts.

Category	eXchange Visor	eXchange Agent
CPU	Pentium III 500MHz and Pentium 4	Pentium III and Pentium 4
Memory	128 MB	64 MB
Hard disk space	500 MB free	300 MB free
CD-ROM drive	Optional	
First Network Adapter	10/100 Mb	10/100 Mb
Parallel Port	Required for the Visor License lock device (dongle)	
External modem	Optional	
Operating system	Windows NT or Windows 2000	Windows NT or Windows 2000

APPENDIX A: CALCULATING THE NUMBER OF IVR PORTS

The IVR subsystem in the Call Center performs activities including Auto Attendant services, Announcements, and all types of generated Outbound Calls. The IVR subsystem is based on IVR ports in the Call Center in conjunction with the appropriate devices on the eXchange Call Center Server.

Guidelines for IVR Port Calculation

Use these guidelines as you calculate the required number of IVR ports on 3Com eXchange Call Centers. The numbers of licenses or devices on the eXchange Call Center Server are applied from these guidelines.

Although the services provided by the IVR subsystem are quite similar on all integrated systems, the role of IVR ports varies due to differences in integration and activities based on IVR at the site, sometimes leading to significant differences in the number of IVR ports required.

We explain and provide details about each of these integrations:

- The type of devices used as IVR ports
- The basic and specific roles of IVR ports
- The recommended minimum and maximum quantities
- A list of arguments that may affect the calculations

Terms Used in the Calculations

Term	Description
CO Trunks for the Call Center	Number of CO trunks connected to the NBX system and used for inbound and outbound activity of the Call Center. In case of split use, such as part of them being used for other activities, use the total number.
Inbound Agents	Number of Agents performing inbound activities concurrently. In most cases, use the number of Inbound licenses
Number of Concurrent Agents	Number of agents logged-on and performing concurrently on the Call Center.
CO	Central Office or Service Provider

IVR Ports on eXchange Call Center Systems

IVR ports are implemented as TAPI WAV ports on the Call Center that are linked to Wav Phone devices on the NBX system.

In the NBX environment, the IVR ports are used in these ways:

- All inbound ACD calls entering the Call Center are routed to IVR ports that also serve as the Waiting in Queue device until a free Agent is available.
- IVR ports also serve as music devices.
- Some ports should be preserved and dedicated for outbound activities.

Taking these special roles into consideration, the number of IVR ports required at a site varies. Calculate:

- Minimum ports =
CO Trunks for the Call Center minus the Inbound Agents plus the Outbound Agents
- Maximum ports = Total number of CO Trunks for the Call Center

Increase the number of ports over the minimum required when:

- The Call Center uses mandatory announcements intensively.
- Many calls are expected to wait in queue
- Agents must perform long Wrap-Up tasks.
- Agents need long Release (Agent break) periods.



You MUST define a minimum of 4 IVR ports per 10 CO trunks for basic operations: Auto-Attendant functionality, Agents with phones ONLY, and so on.