Politecnico di Torino

Esami di Stato di ammissione alla professione di Ingegnere

Prima Sessione 2006 – 20 giugno

Ramo **TELECOMUNICAZIONI** – Tema n. 1

Si chiede al candidato di progettare una rete locale che permetta di offrire sia servizi dati non in tempo reale, sia servizi in tempo reale, con particolare riferimento ai sistemi Voice over IP (VoIP), utilizzando in tutti e due i casi il protocollo IEEE 802.3 100Base-TX (*Fast Ethernet*).

La rete dovrà essere realizzata in un edificio di tipo industriale, di due piani fuori terra a tetto piano, di altezza complessiva pari a metri 8. I tramezzi sono in muratura ed i pavimenti sono rialzati, in modo da consentire il passaggio dei servizi (cavi e tubazioni). Un locale tecnico (indicato in grigio nello schema di disposizione dei locali) è presente in ogni piano per l'eventuale posizionamento di apparati elettronici anche per la trasmissione dati. Un cavedio attraversa in senso verticale l'edificio in corrispondenza dei locali tecnici e termina al piano interrato in una ulteriore locale tecnico più ampio (indicato con sfondo a tratti obliqui nello schema di disposizione dei locali). In questo locale è stata portata una fibra ottica monomodale da utilizzare per collegare la rete aziendale oggetto del presente lavoro alla rete Internet.

In ogni piano dell'edificio si trovano 8 locali quadrati di 144 m^2 ognuno, indicanti in puntinato nello schema di disposizione dei locali, ognuno dotato di una porta di larghezza pari a 2 m verso il corridoio centrale, posta al centro della parete che divide il locale dal corridoio.

In ogni locale devono essere previsti i collegamenti per 12 posti di lavoro, ognuno dei quali dovrà essere dotato di 3 prese conformi alle norme TIA 586, di cui una da usare per il telefono VoIP. Per realizzare la massima flessibilità nella disposizione degli arredi le prese saranno alloggiate in scatole plastiche lasciate libere sulla soletta di cemento posta al di sotto del pavimento rialzato. Le bretelle di collegamento fra le prese e gli apparati utente (PC e telefoni) saranno realizzate dal cliente e passeranno attraverso appositi fori che il cliente realizzerà nel pavimento rialzato.

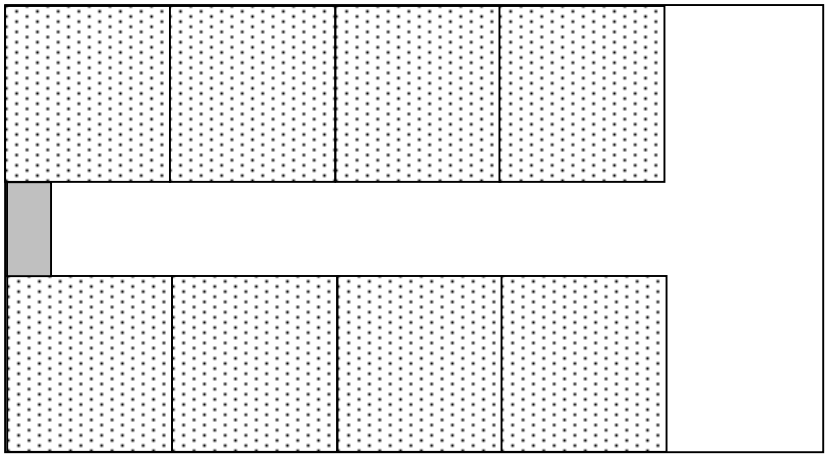
Si chiede al candidato di:

- descrivere la struttura della rete, motivando le scelte fatte ed indicando chiaramente gli apparati che ritiene necessario utilizzare, in particolare per assicurare le garanzie di banda e ritardo necessarie al corretto funzionamento del sistema VoIP.

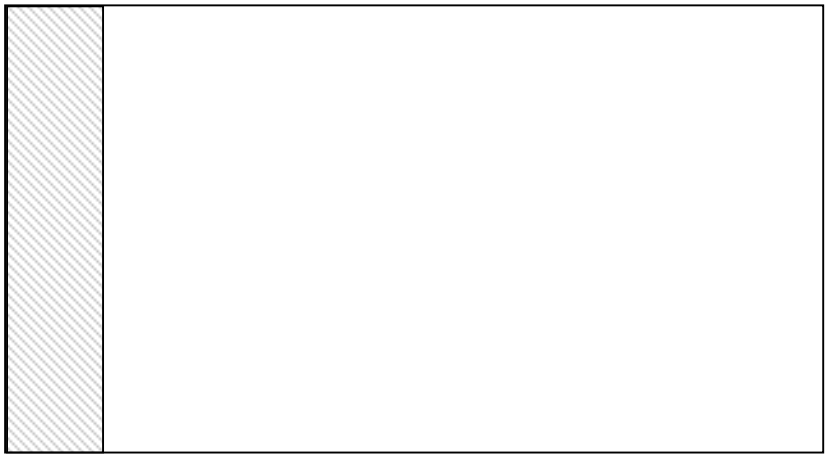
- predisporre la lista completa degli apparati da acquistare per realizzare la rete ed indicare ove saranno posti nell'edificio

- predisporre la lista completa dei materiali da acquistare per realizzare la rete (scatole, prese, connettori, pannelli, armadi, canaline, matasse di cavo, ….).

Sono a disposizione dei candidati per consultazione 5 copie di manuali tecnici presso la cattedra. La consultazione può durare al massimo 10 minuti consecutivi, al fine di assicurare a tutti i candidati la possibilità di accedere al materiale tecnico.



Pianta piani
fuori terra



Pianta
piano
interrato

3Com® NBX® V3000 IP Telephony Solution

Brochure

3Com® NBX® IP Telephony: Changing the Way Business Speaks

Robust 3Com NBX Hardware

- ***System Capacity***
  Scalable to support up to 1,500 devices per location (including up to 720 PSTN lines)
- ***Voice Network Connectivity***
  Loop start analog lines with caller ID capability; T1, T1/PRI, E1/PRI, ISDN BRI-ST, and Q.SIG/PRI
- ***Traditional Telephones***
  Analog Terminal Cards for multiple traditional (2500) phones or G3 fax machine; Legacy Link digital gateways for reuse of existing Nortel handsets
- ***3Com IP Worktops***
  Featuring the 3Com 3100 Entry Phone, 3101 Basic Phone, 3101 Basic Phone with Speaker, 3102 Business Phone, 3103 Manager Phone, 3105 Attendant Console, and 3106C and 3107C Cordless IP Phones

Thirty years ago, researcher Robert Metcalfe had a vision that there was a more cost-effective method of connecting computers so that people could better share information and be more productive. His pioneering work revolutionized computer networking—creating both Ethernet technology and a global, industry-leading networking company, 3Com Corporation.

Building on this initial innovation in data networking and true to its founders' focus on Computers, Communication, and Compatibility, 3Com became an early supporter of converged communications. In 1998, the company developed the NBX® 100 system, the first practical IP telephony solution that would operate reliably across data networks. Now in its fifth generation, this platform is the foundation of the 3Com® NBX V3000 IP Telephony Solution.

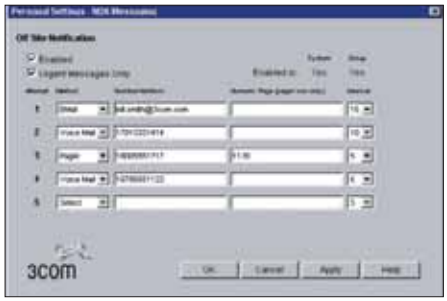
The 3Com NBX and VCX™ platforms comprise the IP Telephony module of the 3Com Convergence Applications Suite—the most recent proof of 3Com's commitment to high-value solutions. The suite allows businesses to choose the communications solutions that best meet their needs. Its modular design lets them immediately gain the benefits of convergence: lowered costs, increased productivity, and improved customer interactions.

With over 20,000 IP telephony systems installed worldwide, over 1,200 patents, approximately 1,900 employees, and operations in over 45 countries, 3Com is the market leader in IP telephony for small to medium enterprises. Because its IP telephony solutions deliver enhanced capabilities and sophisticated applications that cost less and do more than traditional phone systems, businesses around the world choose 3Com voice and data systems for small offices or as part of a larger virtual campus converged network.

The full-featured and exceptionally affordable NBX V3000 system joins the award-winning 3Com portfolio, further demonstrating how the company applies technological innovation to communication challenges, changing the way business speaks.

The 3Com NBX V3000 IP Telephony Solution and Expansion Chassis—right size, right features, right price.

NBX V3000—The Perfect Choice for Small and Medium Businesses



NBX NetSet gives users control over frequently needed capabilities, such as customizing speed dials or creating off-site notification for new or urgent voicemail messages.

Supported by the latest 3Com NBX software, Release 5.0, the 3Com NBX V3000 platform offers a trim 1U-high telephony system, packed with power and features. It includes call processing, four ports by 400 hours of automated attendant and voice mail, four analog FXO ports, and one analog FXS port, as well as a suite of built-in NBX capabilities like Automatic Call Distribution (ACD), graphical Call Detail Recording (CDR), voicemail integration with e-mail, up to nine separate paging zones, and the option of creating a personal operator for customized call coverage.

Reliability You Can Count On

The NBX V3000 system isolates telephone functionality from the everyday issues associated with desktop PCs and servers. Its real-time operating system, VxWorks—so dependable it is also used in heart pace-makers—and its high-availability hardware deliver reliability that can be counted on.

The latest digital signal processor (DSP) technology powers phones and other components in an NBX system, ensuring that every device is capable of maximum performance. The IP phones share the data network with PCs and servers, but don't use the PCs or servers for voice traffic. It's like operating two cars on the same multi-lane highway—even if the PC stalls, the voice traffic is able to pass by unimpeded.

Easy to Install, Use, and Manage

3Com understands that most telephone systems seem like a mystery to everyday users and often to the staff assigned to administer them. The result is often lost productivity and lost opportunity.

An incredibly intuitive administrative portal, 3Com NBX NetSet™, lets individual users and administrators fully customize the NBX V3000 solution. This password-protected, browser-based utility features pull-down menu choices tailored to each facet of the system. Time-saving tools simplify creation of departmental profiles for managing telephone users, further easing system administration.

3Com voice communications technology completely eliminates the high costs and high anxiety normally associated with moving an office telephone. Anyone who has ever had to wait days for an expensive service call merely to get a telephone moved will truly appreciate the self-locating capabilities of 3Com IP phones. Simply unplug a phone from one location and plug it into another network jack. The user's extension number, voice mail, and personal settings move with the phone. It's that simple.

Choices for Today, Flexibility for the Future

"The 3Com NBX V3000 IP telephony solution gave us all the features and performance we required in one fully integrated, easy-to-install-and-maintain package. It's simplicity, scalability, and low cost make the 3Com NBX V3000 platform an ideal small business solution."

Steve Catapano
Chief Operating Officer
Harbor Lights Financial Group IncManasquan, N.J., U.S.A.

"Our converged 3Com systems are a practical investment in our students' education and well-being, delivering voice and data services for a rapid return on our investment. The 3Com solution saves us thousands of dollars each month and can easily scale with us as we continue to grow."

Bill Brauer,
Executive Vice President,
Christopher Newport University, Newport News, Virginia, U.S.

Open Architecture

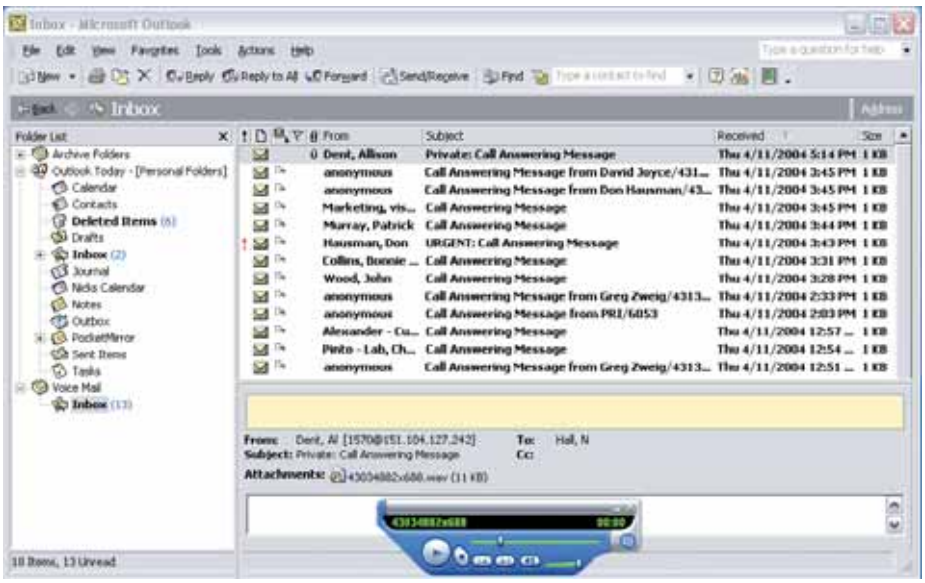
NBX solutions use standards-based interfaces to assure easy integration of new applications. From a foundation of IEEE 802.3 Ethernet that lets users plug 3Com IP phones into millions of Ethernet ports around the world, customers can easily grow their communications network by adding industry-standard switches and routers, expanding capabilities and size to meet evolving needs. 3Com NBX systems provide application flexibility with support for standards such as:

- IMAP4—enables viewing and listening to voice mail with standard e-mail clients (e.g., Microsoft Outlook, Eudora).
- TAPI—lets users dial numbers and manage active calls from a computer screen with built-in computer telephony integration (CTI).
- TAPI/WAV—supports seamless connections to call center and unified messaging applications.

3Com Voice Solution Providers offer numerous out-of-the-box software as well as applications for custom business requirements. Actively supported by 3Com, a host of third-party developers work to enhance the capabilities of NBX systems.

Upgradeable Software

Traditional PBX products often require customers to pay extra for capacity that may never be needed or for capabilities designed originally for large systems. The NBX V3000 solution offers pay-as-you-grow scalability, economical for twenty users and powerful enough for more than a thousand users per site. Business needs inevitably change, so this 3Com solution is software upgradeable for easy expansion and maximum flexibility. New functionality, even documentation, can be available in minutes and automatically distributed to every system device and user. When business needs dictate additional capabilities, they can be added simply with software licenses.



Voice mail can be viewed and managed from PC monitors with standard IMAP4-compatible clients.

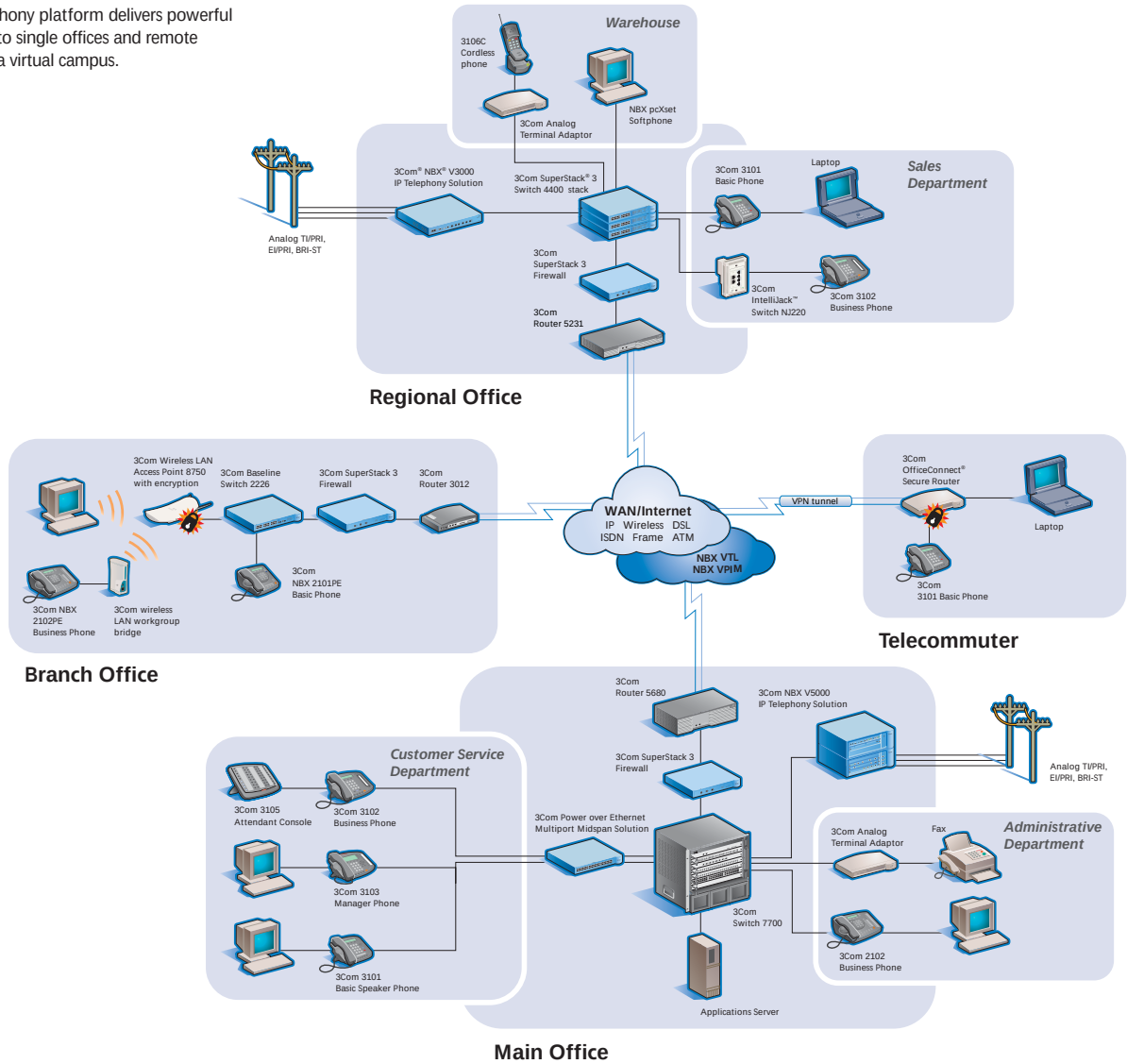
Optimized Communications Among Work Locations

Money-Saving Solutions

Many organizations are challenged by the need for voice communications among staff and resources that are spread across multiple locations. These requirements can be as basic as connecting offices across the street, or as sophisticated as linking multiple campuses across the world. 3Com offers affordable and scalable solutions for seamless telephony services among dispersed offices.

NBX systems let organizations dramatically reduce intra-company long-distance phone charges, while improving customer service. By leveraging a data network that today may only move e-mail and files, users can affordably call between sites, transfer callers, and send voice-mail messages to one or more users located in multiple offices. These capabilities yield faster, easier, more effective communications and customer service.

The 3Com NBX IP telephony platform delivers powerful voice communications to single offices and remote offices that are part of a virtual campus.



NBX Release 5.0 Software Advantages

Zone Paging: To eliminate the need for external software/hardware for zone paging, administrators can customize their NBX V3000 system by creating up to nine paging zones. They can disable paging on individual phones and define zone membership so that only members can page their own group and only members can view the other people in their zone.

Personal Operator: Another advanced feature of the NBX V3000 solution, users can choose a phone number to be their call coverage rather than relying on a default system operator. Callers can be given the option of contacting a live person in the event they are transferred to voice mail. NBX NetSet lets users easily define the number as an internal extension or external phone number, such as a cell phone.

Automatic Call Distribution (ACD): With ACD, businesses can efficiently track incoming calls to operators, an 800 number used for sales, or a service department that needs to evenly distribute incoming calls to agents. The standard ACD package includes two agents, expandable up to a total of 199 agents and 100 supervisors. Call monitor/whisper/barge-in capabilities allow supervisors to assist agents as needed; historical reporting can help optimize call center staffing during peak hours.

Array of Advanced Applications

The built-in functionality of 3Com NBX solutions is impressive, yet there are always organizations that need even more capabilities. 3Com offers solutions for further customization, created both from within 3Com and by some of the best third-party application developers in the world. If an organization requires world-class conference room phones, powerful call centers, the ability to record and monitor calls, or even voice-activated dialing services, 3Com Voice Solution Providers can meet its needs. 3Com's support for standard Application Protocol Interfaces (APIs) makes the NBX platform compelling to developers, ensuring that users can easily reap the benefits of innovation. Solutions are rigorously tested to assure complete integration and superior performance.

VoIP and Toll By-pass Applications

The NBX V3000 solution provides low-cost, high quality Voice over IP (VoIP) using a WAN, VPN, or the Internet. By connecting multiple offices with NBX Virtual Tie Lines, the least expensive long-distance option is used, with calls able to "hop on" the company WAN and "hop off" at the location that offers the most savings.

Multisite connectivity options include traditional analog, T1/PRI/QSIG, or NBX ConneXtions H.323 gateway software.

Multisite Voice Mail Exchange

Multisite Voice Mail Exchange allows the composition and distribution of voice mails to co-workers at other sites where multiple voice messaging systems are used. It also enables communication directly with third-party VPIM-compliant messaging systems.

With the NBX V3000 solution, employee and customer satisfaction can be increased with transparent multisite communications. Support for uniform dialing plans makes reaching another office as simple as calling a co-worker across the aisle.

Advanced Voice Services for Remote Staff and Telecommuters

For years remote workers have enjoyed seamless access to corporate e-mail, but access to the corporate phone system was nearly impossible. 3Com solutions have practically made the term "remote" worker a thing of the past. A broadband connection, router, and a 3Com IP phone allow off-site workers to make and receive calls as if they were in the office. Customers and co-workers can reach formerly "remote" workers with ease. And telecommuters can count on NBX voice mail to professionally answer calls as if they were in the main office.

Voice Messaging Features

A powerful voice messaging system built into the NBX V3000 system ensures that important communications are never missed. Listen over the phone or use a PC with either a browser or a standard IMAP4-compatible e-mail client to hear and manage voicemail messages. Voice mails are saved as .WAV file attachments in the e-mail client and can be detached, shared, and stored indefinitely. Save messages to record transactions or important information—a perfect solution for law offices and financial or customer service organizations. Dozens of built-in voice messaging options include:

System Capacity

Base system supports four automated attendant (AA) ports and 400 hours of voicemail (VM) storage, scalable up to 72 AA ports. Expansion is software based and activated via keycode.

Automated Attendant (AA) Services

Multiple, multilevel AA services provide callers with information and messaging directions when phones are unattended, allowing them to dial by name, number, or department. The automated attendant can support up to 20 menu layers and as many as 1,000 phantom/1,500 station voice mailboxes.

Off-Site Notification

Users can be notified of new or urgent messages via pager, phone, cell phone, or SMTP e-mail client. Cascading notification provides for up to five external destinations.

Voice Profile for Internet Mail (VPIM)

When activated, support for this protocol allows multiple NBX voicemail systems to seamlessly send and receive messages across a secure corporate WAN or the Internet. The NBX system is standards-based, so it can support voicemail communications with any third-party VPIM-compliant system.

Business-Enhancing Desktop Phones and Software

3Com understands that an organization may have unique requirements. That's why the family of 3Com IP phones provides a full range of powerful telephony services and built-in CTI capabilities. Most models support IEEE 802.3af Power over Ethernet (PoE) and the Session Initiation Protocol (SIP) standard. SIP compatibility lets businesses easily migrate from the3Com NBX platform to the 3Com VCX platform, protecting their worktop investment—traditionally between 40% to 50% of an initial telephony system outlay.

3Com IP phones operate dynamically as Layer 2 (Ethernet) or Layer 3 (IP) devices that users can self-locate—plug into any network port without losing personalized configurations and calling privileges. All phones have LCD displays that can access the company directory as well as personal call logs for dialed, received, and missed calls. A variety of models offer varying degrees of sophistication.

Controlling Phone Usage

NBX systems include a powerful call detail reporting (CDR) package to monitor and control business operations. Organizations can track phone usage by internal account numbers to accurately charge clients for phone consultations.

3COM IP PHONES PORTFOLIO AT A GLANCE

	3100 Entry Phone	3101 Basic Phone	3101 Basic Phone with Speaker	3102 Business Phone	3103 Manager Phone	3105 Attendant Console	3106 Cordless Phone	3107 Cordless Phone
Maximum system (line) appearances	1	4	4	18	12	50	4	4
Programmable buttons with lights	No	4	4	18	8	50 / 100 with Shift Button	4	4
Fixed feature buttons	4	5	6	10	10	4	8	9
Display softkeys	No	3	3	3	10	No	No	No
Four-way cursor control	No	Yes	Yes	Yes	Yes	No	No	No
Display size	No	160 x 33 pixels	160 x 33 pixels	160 x 33 pixels	320 x 120 pixels	No	2 lines	2 lines
Ethernet ports	1 - 10/100	2 - 10/100	2 - 10/100	2 - 10/100	2 - 10/100/1000 (Gigabit)	1 - 10/100	1 - 10/100	1 - 10/100
Power over Ethernet support (802.3af)	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Speakerphone	No	Listen-only	Half duplex	Full duplex	Full duplex	No	No	No
Wideband audio support	Handset only	Handset only	Handset only	Yes	Yes	No	No	No
Definable ring tones	No	9	9	9	9	No	No	No
Headset jack	No	No	No	Yes	Yes	No	Yes	Yes
Codecs G.711, ADPCM, G729 A/B	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
G.722 codec-ready handset	Yes	Yes	Yes	Yes	Yes	No	No	No
G.722 codec-ready speakerphone	No	No	No	Yes	Yes	No	No	No
Adaptive jitter buffer	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
QoS: IP-ToS, 802.1p	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
TAPI support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP, Option 184	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjustable stand: 15 to 45 degrees with wall mount	Wall-mount only	Yes	Yes	Yes	Yes	Yes	Base unit	Base unit
Removable faceplate for localization	No	No	No	Yes	Yes	No	No	No
Browser-based administration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Platform support	NBX, VCX*	NBX, VCX	NBX, VCX	NBX, VCX	NBX, VCX*	NBX, VCX	NBX only	NBX only

*Implementation of VCX (SIP-based) support expected summer, 2005.

Need more information?

The 3Com NBX V3000 IP Telephony Solution is available from 3Com Voice Authorized Partners in more than 60 countries with voicemail prompts and end-user documentation in 12 languages.

For additional details, please visit **www.3com.com/iptelephony**

3Com Corporation, Corporate Headquarters, 350 Campus Drive, Marlborough, MA 01752-3064

To learn more about 3Com solutions, visit www.3com.com. 3Com is publicly traded on NASDAQ under the symbol COMS.

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3Com® NBX® V3000 IP Telephony Solution R5.0

DATA SHEET

- Fifth-generation IP telephony system with proven high-fidelity audio and system reliability
- Secure, converged solution eliminates cost and administrative overhead of separate voice and data networks
- IP phone portfolio meets a range of performance and budget requirements
- Redundancy options include disk mirroring, dual power supplies and dual ethernet uplinks
- Advanced built-in applications include automated attendant, voice mail, automatic call distribution, and graphical call detail recording
- Easily integrated, productivity-enhancing application options include IP Messaging, eXchange Call Center, ExecutiveAssistant, and Education Module

Key Benefits

Increased Productivity

With the 3Com® NBX® V3000 IP Telephony Solution, small to medium size organizations can increase efficiency, enhance collaboration and improve customer interactions. Advanced applications and intuitive, browser-based management can optimize services and minimize the need for additional personnel.

The NBX platform offers built-in, productivity enhancing tools such as voice mail, automatic call distribution (ACD), computer telephony integration (CTI) via TAPI, visual voicemail/e-mail clients (IMAP4), desktop administration, and call detail reporting (CDR) applications.

R5.0 enhancements include:

- Four new IP phones
- Built-in ACD
- Forced and verified account codes
- Personal operator service
- Silent monitor/whisper/barge-in functionality

Easy Deployment

Standards-based design, including support for switched IEEE 802.3af Power over Ethernet (PoE), facilitates seamless integration with existing network infrastructure and provides the investment assurance of cost-effective system evolution. Open Applications Protocol Interface (API) architecture provides access to best-in-class third-party applications.

Practical Scalability

Organizations can boost capacity and enhance applications via software upgrades, without the need for expensive hardware acquisitions. Cost-saving incremental licensing provides scalability up to 1,500 devices (lines/stations; maximum 720 PSTN lines) and up to 48 NBX IP Virtual Tie Lines (VTLs).

Reduced Operation Costs

A single voice and data network gives organizations the advantages of a converged infrastructure. Streamlined deployment and management optimize existing IT resources. Easy moves-adds-changes can significantly lower total cost of ownership.

Reduced Communications Costs

VoIP telephony enables dramatic cost reduction of long distance calling expenses—unified multisite dialing plans and hop-on/hop-off toll-bypass across wide area networks (WANs) can deliver immediate savings. Multisite message exchange options between 3Com and third-party Voice Profile for Internet Mail (VPIM)-compliant voicemail systems offer multisite organizations the economy of interoperable systems.

Budget-Matching IP Phone Choices

IP phones with robust feature-sets let organizations optimize their investments in communications infrastructure. Choices include 10/100/1000 Mbps Ethernet/IP phones, softphones, and receptionist consoles that support SIP or NBX call control and PoE for deployment flexibility.

Broad Range of Advanced Applications

For improving business activities, 3Com NBX systems support numerous standards-based applications, including advanced ACD capabilities with 3Com eXchange Call Center software, enhanced desktop productivity with 3Com ExecutiveAssistant call recording and find me/follow me services, and reuse of Nortel handsets with the 3Com Legacy Link solution. Additionally, the 3Com Voice Solution Providers Program delivers third-party offerings tested for compatibility and integration with 3Com voice solutions.

Specifications

Package Contents
NBX V3000 IP Telephony Solution

System Requirements
100BASE-TX or switched Ethernet LAN
3Com NBX V3000 IP Telephony Solution
Min. two 3Com IP phones

System Capacity
Supports up to 1,500 devices (lines/stations), including up to 720 PSTN Central Office lines and 48 Virtual Tie Lines

PSTN Gateway Options
Loop-start analog, T1/PRI, E1/PRI, ISDN BRI-ST, Q.SIG/PRI

Port Connections
WAN: via external router with IP-ToS support
LAN: 1 10/100 uplink port
Diagnostic: Serial port

Analog Devices
Supports 2500 series-compatible analog devices, including cordless phones, fax machines, night bells, and door ringers

Network, Prioritization, and Audio Compression Standards
H.323, G.711, G.729a/b, ADPCM, 802.1d, 802.1p, 802.1q, 802.2, 802.3, 802.3af, 802.11, IP, IP-ToS, DiffServ, TCP/IP, UDP/IP, DHCP, DNS

Application Standards
TAPI 2.1, TAPI/WAV, IMAP4, HTTP, H.323, SMTP/MIME, VPIM

Management
Built-in 3Com NBX NetSet™ utility; 3Com Network Supervisor support

NBX Voicemail Languages/Dialects
Chinese (Cantonese), Chinese (Mandarin), English (Australian), English (UK), English (US), French (Parisian), German, Hebrew, Italian, Spanish (Castilian), Spanish (Mexican), Russian

Power Requirements
NBX V3000: 100-120 VAC, 50-60 Hz, 1 A
220-240 VAC, 50-60 Hz, 0.5 A

Power Dissipation
NBX V3000: 50 W
Phone: 5 W (maximum)

Chassis/Call Processor Dimensions and Weight
Height: 4.445 cm (1.75 in)
Width: 37.465 cm (14.75 in)
Depth: 43.815 cm (17.25 in)
Weight: chassis—5.68805 kg (11.54 lb)

Environmental Ranges
Operating temperature: 0° to 40°C (32° to 104°F)
Storage temperature: -40° to +70°C (- 40° to +158°F)
Humidity: 5% to 85% noncondensing

Network Access Standards
National Requirements FCC Part 68, Canada CS03 CTR4/A1 (Commission Decision 98/520/EC)

Safety
UL/CUL 1950 3rd Edition
IEC 60950: 1991 + A1, A2, A3, A4; National deviations for Europe and Australia

Emissions
FCC Part 15 Class A and B
EN 55022:1994/A1, 1995/A2, 1997 Class A
VCCI Class A
AS/NZS 3548:1995 Class A

Immunity
EN 55024:1998

Ordering Information

PRODUCT DESCRIPTION	3COM SKU
NBX V3000 IP Telephony Solution Supports 250 NBX devices (expandable up to 1,500 devices) and 12 NBX voicemail languages; includes NBX voicemail with four ports/400 hours AA/VM (expandable to 72 ports AA/VM), one IP On-the-Fly License, one 10/100 uplink port, four analog FXO ports, one analog FXS port, 15 phone licences (in base package), one system hard disk, one autosensing 110/220 V 50/60 Hz AC power supply, one eight-foot power cord (order must specify country type), and 19-inch rack-mounting ears.	3C10600A-XX
NBX V3000 512MB Memory Upgrade Kit Required to install with system capacity upgrade licenses beyond 250 devices (3C10317, 3C10287, 3C10325); one memory upgrade allows system to operate up to a maximum of 1,500 devices.	3C10240
NBX V5000 Chassis Provides four universal slots, two resilient 10/100 uplink ports with failover support, one 10 Mbps shared Ethernet uplink port, SSII Advanced Redundant Power Supply (RPS) uplink port, one autosensing 110/220 V 50/60 Hz AC power supply, one eight-foot power cord (order must specify country type), and 19-inch rack-mounting ears. Compatible with NBX 100, NBX V3000, and NBX V5000 systems.	3C10200-XX
NBX Device License Upgrades Unit-based licenses enable an incremental number (up to 1,500) of devices in addition to the 512 MB Memory Upgrade Kit (3C10240). Requires R4.4 or higher system software. Single-Device Call Processor Upgrade 125-Device Call Processor Upgrade 250-Device Call Processor Upgrade	 3C10317 3C10287 3C10325
NBX V3000 Hard Drive Field Replacement Unit (FRU) Replacement hard disk FRU enabling a customer to replace a faulty NBX V3000 system disk, eliminating costly downtime and wait for a service technician to replace the drive and restore system operation.	3C10118A
NBX V3000 Chassis FRU Replacement chassis FRU enabling a customer to replace a faulty NBX V3000 chassis without returning hard disk assembly, eliminating costly downtime and wait for a service technician to replace the drive and restore system operation.	3C10241
NBX Uplink Card Includes eight RJ-45 uplink ports (10 Mbps shared Ethernet) to add an NBX chassis or to support other NBX devices.	3C10370
NBX Analog Line Card (FXO) Terminates up to four Loop-start PSTN telephone lines to the NBX system via four RJ-11 interfaces; includes built-in caller ID support (service must be purchased from a telco/PTT) and built-in power failure transfer jack. Requires R4.4 or higher system software.	3C10114C
NBX Analog Terminal Card (FXS) Terminates up to four tip/ring analog devices such as an analog phone, cordless phone, Group 3 fax machine, speakerphone adjunct, etc. Does not support modems. Requires R4.4 or higher system software.	3C10117C
NBX Analog Adapter (FXS) Standalone device converts an Ethernet connection into an analog station port (FXS) for industry standard analog phones or similar devices; provides a switched 10/100 Ethernet port for another device such as a PC; supports IEEE 802.3af Power over Ethernet (PoE); does not support modems; local power supply included. Requires NBX R4.4 or higher system software.	3C10400-XX
NBX T1/PRI Card Terminates a voice T1, T1/PRI, or Q.Sig slave circuit into the NBX system; for optimized network loading includes a 10/100 MB MDI uplink port to connect to a LAN switch port, plus a built-in CSU. Requires R4.4 or higher system software.	3C10116D
NBX BRI-ST Card Terminates up to eight ISDN BRI-ST lines into the NBX system. Requires R4.4 or higher system software.	3C10164C-ST
NBX E1/PRI Card Terminates a voice E1/PRI or PRI/Q.Sig slave circuit into the NBX system; for optimized network loading includes a 10/100 MB MDI uplink port to connect to a LAN switch port, plus a built-in CSU. Requires R4.4 or higher system software.	3C10165D

Ordering Information *(continued)*

PRODUCT DESCRIPTION	3COM SKU
NBX Voicemail System Upgrade Licenses	
One-port license	3C10288
Eight-port license	3C10326
20-port license	3C10327
3Com 3100 Entry Phone	
Provides a single-line IP entry phone for basic telephone services via analog feature code access and one 10/100 Ethernet port (no PC port); supports 802.3af PoE standard; includes preprogrammed services for volume up/down, buttons for FWD Mail and Mail Retrieve, large LED for messages waiting; local power supply sold separately (see 3C10224-XX or 3C10444-XX). Requires NBX R5.0 system software and an NBX Group 0 device license (3C10410), sold separately.	3C10399A
3Com 3101 Basic Phone	
Provides listen-only speaker, a two-line pixel display with three softkeys, a four-way cursor controller, four programmable buttons, and two 10/100 switched Ethernet ports; supports 802.3af PoE standard; local power supply sold separately (see 3C10224-XX or 3C10444-XX). Requires NBX R4.4 or higher system software and an NBX Group 1 device license (3C10411), sold separately.	3C10401A
3Com 3101SP Basic Phone with Speaker	
Provides half-duplex speakerphone, a two-line pixel display with three softkeys, a four-way cursor controller, four programmable buttons, and two 10/100 switched Ethernet ports; supports 802.3af PoE standard; local power supply sold separately (see 3C10224-XX or 3C10444-XX). Requires NBX R4.4 or higher system software and an NBX Group 1 device license (3C10411), sold separately.	3C10401SPKRA
3Com 3102 Business Phone	
Provides full-duplex speakerphone, a two-line pixel display with three softkeys, a four-way cursor controller, 18 programmable buttons with lights, 10 fixed-feature buttons, removable language-specific faceplate for additional communications flexibility, and two 10/100 switched Ethernet ports; supports 802.3af PoE standard; local power supply sold separately (see 3C10224-XX or 3C10444-XX). Requires NBX R4.4 or higher system software and an NBX Group 2 device license (3C10412), sold separately. .	3C10402A
3Com 3103 Manager Phone	
Provides a full-featured IP manager phone with large user-friendly menu-driven UI, high-quality full-duplex speakerphone, large pixel display with 12 system appearances and 10 display softkeys, a four-way cursor controller, 10 fixed-feature buttons, eight feature buttons w/ LEDs, and two 10/100/1000 switched Ethernet ports; supports 802.3af PoE standard; local power supply sold separately (see 3C10224-XX or 3C10444-XX). Requires NBX R5.0 system software and an NBX Group 2 device license (3C10412), sold separately	3C10403A
3Com 3105 Attendant Console	
Provides up to 100 programmable functions via 50 buttons with high/low shift position, four pre-programmed buttons, and one 10/100 Ethernet port; supports 802.3af PoE standard; local power supply sold separately (see 3C10224-XX or 3C10444-XX). Requires NBX R4.4 or higher system software and an NBX Group 2 device license (3C10412), sold separately.	3C10405A
3Com 3106C Cordless Phone	
Provides a 900 MHz IP cordless phone for in-building mobility with roaming up to 1,000 feet from the base station under supported operating guidelines, six hours talk time, four days standby, a two-line pixel display, four programmable buttons, and eight preprogrammed buttons; up to ten 3106C devices can operate in a domain radius; base station requires local power (power supply included). Requires NBX R5.0 system software and an NBX Group 1 device license (3C10411), sold separately.	3C10406A
3Com 3107C Cordless Phone	
Provides a 900 MHz IP cordless phone for in-building mobility with roaming up to 1,000 feet from the base station under supported operating guidelines, six hours talk time, four days standby, a two-line pixel display, four programmable buttons, nine preprogrammed buttons; up to three 3107C devices can operate in a domain radius; base station requires local power (power supply included). Requires NBX R5.0 system software and an NBX Group 1 device license (3C10411), sold separately.	3C10407A
NBX Group 0 Phone License	
Permits connection of a 3Com 3100 phone to an NBX system; one license per phone required for operation; may be ordered in any quantity; not required for NBX 1100 and 2100 series phones. Requires R5.0 system software. One-port license (unit-based).	3C10410
NBX Group 1 Phone License	
Permits connection of a 3Com 3101, 3101SP, 3106C, or 3107C phone to an NBX system; one license per phone required for operation; may be ordered in any quantity; not required for NBX 1100 and 2100 series phones. Requires R4.4 or higher greater system software. One-port license (unit-based).	3C10411
NBX Group 2 Phone License	
Permits connection of a 3Com 3103 Manager Phone, 3102 Business Phone, or 3105 Attendant Console to an NBX system; one license per phone required for operation; may be ordered in any quantity; not required for NBX 1100 and 2100 series phones. Requires R4.4 or higher system software. One-port license (unit-based).	3C10412
NBX IP On-the-Fly Site License	
Allows local and remote NBX devices to operate as IP phones at Layer 3 on a per-call basis with each LAN-based device returning its IP address to the "pool" on the NCP after call completion; License included with NBX 100/NBX V3000/NBX V5000 purchases after 26Jan04.	3C10132
NBX IP Serve Site License	
Allows local and remote supported NBX devices to operate as IP phones at Layer 3 via static or DHCP IP addressing; one IP address needed per MAC address (each device and CO port) in the system. Requires R4.4 or higher system software.	3C10131
NBX ConneXtions Gateway License	
Software-based H.323 gateway license supports one concurrent VoIP H.323 session added to existing installed session; uses a dedicated Windows NT/2000 workstation or server (PC HW and OS license not included). Requires R4.4 or higher system software. One-port license (unit-based).	3C10315
NBX IP Virtual Tie Line License	
Enables NBX system-to-NBX system VoIP calling between sites; includes 60-day trial NBX IP On-the-Fly License. Requires R4.4 or higher system software.	
One-port 60-day trial license	3C10270
Two-port license (unit-based)	3C10328
NBX VPIM Multisite Messaging Exchange License	
Lets NBX solutions exchange voice mails with third-party VPIM-enabled voicemail systems. Requires NBX R4.4 or higher system software.	
60-day trial license	3C10276
Site license	3C10277

Ordering Information *(continued)*

PRODUCT DESCRIPTION	3COM SKU
NBX 3rd-Party Messaging License	
Can connect NBX and 3rd-party voicemail systems. Requires NBX R4.0 or higher system software and NBX WAV application ports.	
60-day trial license	3C10278
Site license	3C10279
NBX Media Driver License	
Supports seamless connections for TAPI/WAV applications to NBX solutions; eliminates need for T1/PRI card or analog connections between third-party application server and NBX. Requires NBX R4.1 or higher system software.	
60-day trial license (four-port license)	3C10318
One-port license (unit-based)	3C10319
Site License	3C10329
NBX pcXset™ License	
Puts the equivalent of an NBX business phone ("softphone") on the screen of a laptop or PC running Windows 98/NT/2000/XP; USB handset or headset not included; incremental or site licenses available. Requires R4.1 or higher system software.	
One-user license (unit-based)	3C10316
Site license	3C10154
Polycom Device License	
Allows a Polycom Soundstation IP 3000 to connect to an NBX solution; one license needed per Polycom unit. Requires R4.1 or higher system software. One-port license (unit-based).	3C10282
3Com Legacy Link for Norstar	
16-port gateway allows Nortel Norstar phones to connect to the NBX solution. Requires NBX R4.1 or higher system software.	
60-day trial license	3C10321
One-board (unit based)	3C10390
One-board license (unit based)	3C10283
3Com Legacy Link for Meridian	
16-port gateway allows Nortel Meridian phones to connect to the NBX solution. Requires NBX R4.1 or higher system software.	
60-day trial license	3C10321
One-board (unit based)	3C10391
One-board license (unit based)	3C10283
3Com Legacy Link—Analog	
16-port gateway allows analog phones to connect to the NBX solution. Requires NBX R4.2 or higher system software.	
One-board (unit based)	3C10392
One-board license (unit based)	3C10361
3Com NBX V3000 PoE Bundle	
Small-to-medium business market-priced and feature-optimized, includes one 3Com NBX V3000 IP Telephony Solution and one 24-port 3Com Baseline Switch 2226-PWR Plus: NBX V3000—four analog FXO ports, one analog FXS port, four ports/ 400 hours of NBX Voice Mail, 15 Business Phone licenses, and 250 devices (expandable to 1,500 devices); Baseline Switch 2226-PWR Plus—PoE, 24 x 10/100 copper ports, two x dual-purpose Gigabit SFP slots for either 1000Base-SX (3CSFP-91) or 1000Base-LX (3CSFP-92) modules.	3CV3000PWR-XX
NBX Call Record and Monitor Licenses	
Enables third-party call recording and monitoring systems to connect to NBX solutions. Requires R4.1 or higher system software.	
Site license	3C10286
NBX ACD Licenses	
Increases capacity from built-in two ACD agents; must install 3C10440 before proceeding to N+1 agent pricing key code (3C10441). Requires R5.0 system software.	
Three-agent base upgrade package (for a total of five agents)	3C10440
One-agent license (for increasing from 6 to a maximum of199 agents)	3C10441
3Com ExecutiveAssistant Base Package	
Base package includes one Advanced Client License for speech recognition auto attendant and speech recognition company directory. Requires purchase of separate Windows-based server and NBX Media Driver port license.	3C10450
3Com eXchange Call Center Base Package	
Comprehensive voice routing and management system controls, monitors, and reports call center interactions, distribution, and handling activities; includes 10 inbound Voice Agents and one eXchange Visor-Supervisor. Requires purchase of separate Windows-based server and NBX Media Driver port licenses.	3C10380
3Com Education Module	
Software package specifically designed to assist K-12 schools includes auto dialer for absentee reporting, enhanced IVR for homework hotline, and 911 emergency call event notification with record-on-demand.	
Base package (supports an initial 500 students)	3C10510
Additional 250 students (beyond base package)	3C10511

Notes—When ordering, replace XX with the applicable suffix: AA = Australia, New Zealand; ME = Europe; SA = South Africa; UK = United Kingdom; US = Canada, Latin America, United States. See 3Com Voice Solution Global Price list for complete summary of SKU's and detailed compatibility matrix.

3com
Exercise Choice™

CELEBRATING 25 years of NETWORKING

3Com Corporation, Corporate Headquarters, 350 Campus Drive, Marlborough, MA 01752-3064

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NETWORKING SOLUTIONS

Switching

10/100 and Gigabit Ethernet Switching

> High-performance, dependable switching solutions for all connectivity needs
> Choose from a wide portfolio of desktop, rackmount, and stackable switches with features that can be aligned with business requirements
> Standards-based, proven solutions from a name you trust—3Com

		PORT CAPACITY						FUNCTIONALITY					PERFORMANCE		SERVICE
Product	Order Number	Height	Module Slots per unit / stack	10/100 Ports per unit / stack	100BASE-FX per unit / stack	10/100/1000 Ports per unit / stack	1000BASE-X Ports per unit / stack[1]	IEEE 802.1X User Login Security	IEEE 802.3af Power over Ethernet	QoS / Traffic Prioritization	Priority Queues	VLANs / Max Number	Switching Capacity (Max)	Forwarding Rate (Max)	Service Order Number
3COM SWITCH 4500 FAMILY															
3Com Switch 4500 26-Port	3CR17561-91	1RU	4 / 32	24 / 192	2 / 16	2 / 16	2 / 16	Yes	Yes	Yes	8	Yes / 256	8.8 Gbps	6.5 Mpps	3CS-3YREXP74-02
3Com Switch 4500 50-Port	3CR17562-91	1RU	4 / 32	48 / 384	2 / 16	2 / 16	2 / 16	Yes	Yes	Yes	8	Yes / 256	13.6 Gbps	10.1 Mpps	3CS-3YREXP74-04
3Com Switch 4500 PWR 26-Port	3CR17571-91	1RU	2 / 16	24 / 192	2 / 16	2 / 16	2 / 16	Yes		Yes	8	Yes / 256	8.8 Gbps	6.5 Mpps	3CS-3YREXP74-04
3Com Switch 4500 PWR 50-Port	3CR17572-91	1RU	4 / 32	48 / 384	2 / 16	2 / 16	2 / 16	Yes		Yes	8	Yes / 256	13.6 Gbps	10.1 Mpps	3CS-3YREXP74-05
3COM SUPERSTACK 3 SWITCH FAMILY															
3Com SuperStack 3 Switch 4400 24-Port	3C17203	1RU	2 / 8	24 / 192	2 / 8	2 / 8[2]	2 / 8	Yes		Yes	4	Yes / 64	8.8 Gbps	6.6 Mpps	3CS-EXP74-04
3Com SuperStack 3 Switch 4400 48-Port	3C17204	1RU	2 / 8	48 / 384	2 / 8	2 / 8[2]	2 / 8	Yes		Yes	4	Yes / 64	13.6 Gbps	10.1 Mpps	3CS-EXP74-05
3Com SuperStack 3 Switch 4400 PWR	3C17205	1RU	2 / 8	24 / 192	2 / 8	2 / 8[2]	2 / 8	Yes	Yes	Yes	4	Yes / 64	8.8 Gbps	6.6 Mpps	3CS-EXP74-04
3Com SuperStack 3 Switch 4400 FX	3C17210	1RU	2 / 8		24 / 192	2 / 8[2]	2 / 8	Yes		Yes	4	Yes / 64	8.8 Gbps	6.6 Mpps	3CS-EXP74-05
3Com SuperStack 3 Switch 4400 SE	3C17206	1RU	2 / 8	24 / 192	2 / 8	2 / 8[2]	2 / 8	Yes		Yes	4	Yes / 64	8.8 Gbps	6.6 Mpps	3CS-EXP74-02
3Com SuperStack 3 Switch 4250T	3C17302	1RU		48 / 192		2				Yes	2	Yes / 60	13.6 Gbps	10.1 Mpps	3CS-EXP74-04
3Com SuperStack 3 Switch 4228G	3C17304	1RU		24 / 96		2	2 / 8			Yes	2	Yes / 60	12.8 Gbps	9.5 Mpps	3CS-EXP74-02
3Com SuperStack 3 Switch 4226T	3C17300	1RU		24 / 96		2				Yes	2	Yes / 60	8.8 Gbps	6.6 Mpps	3CS-EXP74-02
3Com SuperStack 3 Switch 3870 24-Port	3CR17450-91	1RU	1			24 / 384	4 / 32	Yes		Yes	8	Yes / 254	108 Gbps	80 Mpps	3CS-EXP74-05
3Com SuperStack 3 Switch 3870 48-Port	3CR17451-91	1RU	1			48 / 384	4 / 32	Yes		Yes	8	Yes / 254	156 Gbps	115 Mpps	3CS-EXP74-05
3Com SuperStack 3 Switch 3848	3CR17402-91	1RU				48	4	Yes		Yes	8	Yes / 254	96 Gbps	71 Mpps	3CS-EXP74-05
3Com SuperStack 3 Switch 3824	3C17400	1RU				24	4	Yes		Yes	8	Yes / 254	48 Gbps	35.7 Mpps	3CS-EXP74-05
3Com SuperStack 3 Switch 3812	3C17401	1RU				12	4	Yes		Yes	8	Yes / 254	24 Gbps	17.8 Mpps	3CS-EXP74-04
3Com SuperStack 3 Switch 3250	3CR17501-91	1RU		48		2	2	Yes		Yes	4	Yes / 255	13.6 Gbps	10.1 Mpps	3CS-EXP74-04
3Com SuperStack 3 Switch 3226	3CR17500-91	1RU		24		2	2	Yes		Yes	4	Yes / 255	8.8 Gbps	6.6 Mpps	3CS-EXP74-02

1 Includes 1000BASE-SX, 1000BASE-LX and/or SFP.
2 Connectivity is 1000BASE-T only.

SPOTLIGHT

3Com Switch 4500 Family

(3CR17561-91, 3CR17562-91, 3CR17571-91, 3CR17572-91)

The 3Com Switch 4500 Family of managed, stackable 10/100 Ethernet switches provides secure, flexible LAN connectivity for small to medium enterprise and branch office networks. The Switch 4500 Family offers Layer 2 switching and dynamic Layer 3 routing, as well as robust security, Quality of Service, and management features to deliver intelligent edge connectivity for essential business applications.

FEATURES AND BENEFITS:

Secure the Network
Protect network's resource's and information with essential security features that provide user and device authentication, enforce access control for switch management, and enhance overall network security

Empower Application Convergence
Ensure essential applications get priority with the Switch 4500 family's combination of high-performance switching, Quality of Service, and advanced traffic management features. 3Com Smart PoE delivers intelligent power management with dynamic allocation of available power resources

Simplify Voice over IP (VoIP)
Automate configuration, detect IP phones, dynamically assign switch ports to the Voice VLAN and prioritize VoIP traffic using the unique Voice VLAN feature. Effectively minimize the cost and complexity associated with adding or moving IP phones

Cost Effective
Delivering Power over Ethernet capability means electricity and data are provided over a single Ethernet cable, resulting in significant cost savings when deploying devices such as IP phones, wireless access points, and IP security cameras

Scalable Switching Solution
Flexible in design, the switches have user-configurable dual-personality Gigabit Ethernet interfaces and the ability to stack up to eight switch units (384 10/100 connectivity ports) that can be managed as a single entity

Enhance Management and Control
Improve business productivity by reliably supporting business applications and facilitate ease of use with features such as dynamic routing with RIP (Routing Information Protocol), auto-negotiation on ports, Auto MDI/MDIX, plus access to management features via command line interface or SNMP management software

Baseline Plus and Baseline Switches

		PORT CAPACITY				MANAGEMENT	FUNCTIONALITY				SERVICE
Product	Order Number	Height	10/100 Ports	10/100/1000 Ports	Gigabit Uplink Ports	Smart Managed	Link Aggregation	QoS	VLANs	Power over Ethernet	Service Order Number
3COM BASELINE PLUS FAMILY											
3Com Baseline Switch 2824-SFP Plus	3C16487	1 RU		24	4 (SFP)	Yes	Yes	Yes	Yes		3CS-EXP74-02
3Com Baseline Switch 2816-SFP Plus	3C16485A	1 RU		16	4 (SFP)	Yes	Yes	Yes	Yes		3CS-EXP74-02
3Com Baseline Switch 2226 PWR Plus	3C16490	1 RU	24		2 (1000BASE-T or SFP)	Yes	Yes	Yes	Yes	Yes	3CS-EXP74-04
3Com Baseline Switch 2226 Plus	3C16475BS	1 RU	24		2 (1000BASE-T or SFP)	Yes	Yes	Yes	Yes		3CS-EXP74-01
3Com Baseline Switch 2250 Plus	3C16476BS	1 RU	48		2 (1000BASE-T or SFP)	Yes	Yes	Yes	Yes		3CS-EXP74-02
3COM BASELINE FAMILY											
3Com Baseline Switch 2824	3C16479	1 RU	24								3CS-EXP74-04
3Com Baseline Switch 2816	3C16478	1 RU	16								3CS-EXP74-02
3Com Baseline Switch 2808	3C16477A	1 RU	8								3CS-EXP74-01
3Com Baseline Switch 2126-G	3C16472	1 RU	24		2 (1000BASE-T)						3CS-EXP74-01
3Com Baseline Switch 2024	3C16471	1 RU	24								3CS-EXP74-01
3Com Baseline Switch 2016	3C16470	1 RU	16								3CS-EXP74-01

SPOTLIGHT

3Com Baseline Switch 2824-SFP Plus

(3C16487)

The 3Com Baseline Plus Family provides a unique combination of performance, quality, and network management and control capabilities in a value-priced switch.

FEATURES AND BENEFITS:

Wire-Speed Performance
Support today's demanding applications with high-capacity Gigabit Ethernet connectivity

Flexible, Configurable Gigabit Uplinks
Allow flexible media support with modular SFP Gigabit interfaces

Exceptional Value Rack-Mountable Switching
Deliver fast, reliable connectivity with intuitive web-based management at a very affordable price

Limited Lifetime Warranty
Support 24x7 availability with an industry-leading warranty

SPOTLIGHT

3Com SuperStack 3 Switch 3870 Family

(3CR17450-91, 3CR17451-91)

The 3Com SuperStack 3 Switch 3870 Family of switches provide scaleable, wire-speed Gigabit Ethernet connectivity for affordable "Gigabit-to-the-Desktop" connectivity.

FEATURES AND BENEFITS:

Affordable Gigabit-to-the-Desktop Switching
Provide scalable bandwidth for increasingly demanding business applications

Investment Protection
Gain protection unmatched by competing products in its class with available 10-Gigabit uplink and Layer 3 routing (via software upgrade)

Robust Feature Set in Support of Secure Converged Networks
Enhance security with features such as 802.1X network login, RADIUS authentication, and SSH/SSL management access. Traffic prioritization and Quality of Service features enable convergence of IP telephony and other emerging applications

Limited Lifetime Warranty
Support 24x7 availability with an industry-leading warranty

Clarity⁶™
the clear performance choice

ORTRONICS®

Cavo UTP Clarity⁶ in Categoria 6

Clarity. The clear performance choice.

Il cavo UTP *Clarity⁶* rappresenta la soluzione definitiva per la realizzazione di una rete predisposta per future evoluzioni. Questo cavo è appositamente studiato per rispondere ai requisiti dei componenti *Clarity⁶* in termini di prestazioni. Questo cavo ad alte prestazioni utilizza un elemento centrale a croce che riduce il rischio di schiacciamento e attorcigliamento, principali cause del cattivo funzionamento dei cavi. Il cavo *Clarity⁶* è stato progettato in base a requisiti rigorosi per poter essere compatibile con i protocolli futuri ed al tempo stesso completamente compatibile con gli standard attuali.

Caratteristiche

- Ottimizzato per applicazioni full duplex sulle 4 coppie
- Maggiore larghezza di banda utilizzabile testata fino a 350 MHz
- Caratteristiche di bilanciamento documentate (LCL/TCL, EL, TCTL)
- Attenuazione ridotta (insertion loss)
- Verificato da terzi in base allo standard TIA/EIA 568-B.2-1 per la Categoria 6
- Verificato da terzi in base a ISO/IEC-11801 (2ª edizione) Classe E
- Cavo UTP con le più alte prestazioni attualmente disponibili
- Disponibile con guaina PVC e LSZH
- NVP (velocità nominale di propagazione): 70%

THE PERFORMANCE & FLEXIBILITY PEOPLE

ETL VERIFIED

Codici d'ordine

Codice prodotto	Descrizione	Lung.
OR-100UC6H-EU-05	Cavo orizzontale a bassa emissione di fumo e alogeni (LSZH) in Categoria 6	305 m
OR-100UC6R-EU-05	Cavo riser in PVC Categoria 6	305 m

Specifiche

Materiali

Filo di rame nudo da 0,56 mm (23 AWG) isolato con polietilene (cavo riser) oppure filo isolato con FEP (cavo plenum).

Due conduttori isolati ritorti a formare una coppia. Quattro coppie a formare l'unità di base con guaina di PVC a propagazione ritardata della fiamma.

Norme

Europa	EN50173
Internazionale	ISO/IEC 11801 (2ª edizione) Classe E
Nord America	ANSI/TIA/EIA-568-B.2 Categoria 6

Classificazioni di resistenza a fiamma e temperatura

Non-Plenum	UL 1666, CMR, CMG, IEC 332-1
Plenum	UL 910, CMP

Installazione	Da 0°C a +50°C
Funzionamento	Da 10°C a +60°C

Prestazioni

Il cavo eccede le prestazioni di canale previste dagli standard. Vedere la scheda tecnica sul Canale *Clarity*^{6}.

Prodotti Clarity correlati

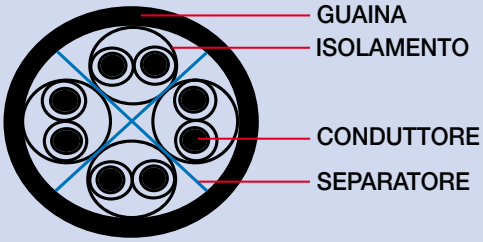
Kit di blocchi 110 in Categoria 6 serie 110ABC6

TracJack in Categoria 6 serie TJ6

Pannelli di permutazione ad alta densità in Categoria 6 serie PHD66U

Bretelle di permutazione modulari in Categoria 6 serie MC6

Sviluppi tecnologici di Clarity^{6}



Per maggiori informazioni tecniche, consultate le nostre relazioni tecniche all'indirizzo www.ortronics.com/sc/wp

Dimensioni

	CMR (PVC)	LSZH
Diametro conduttore mm (in)	0,56 (0,022)	0,56 (0,022)
Diametro cavo mm (in)	6,4 (0,250)	6,4 (0,250)
Peso nominale cavo kg/km (lb/kft)	42,5 (29)	57,2 (39)
Tensione di installazione max. N (lb)	110 (25)	110 (25)
Raggio di curvatura min. mm (in)	25,4 (1,0)	25,4 (1,0)

TracJack è un marchio registrato e Clarity è un marchio commerciale di Ortronics, Inc.

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