

# Passport 6400 Series Multiservice Edge Switches

## Passport 6400 features and benefits

- *Decrease total networking costs*
- *Increase network performance*
- *Enable flexible, reliable, and secure LAN/WAN networks*
- *Optimize network resources*
- *Future proof enterprise networks*

The Nortel Networks Passport 6400 series of Multiservice Edge Switches decreases network operating costs and reduces network complexity, while increasing network performance and availability.

The Passport 6400 series of scalable Multiservice Edge Switches includes the Passport 6480, the Passport 6440, and the Passport 6420.

The Passport 6400 series integrates local and wide area networks (LANs/WANs) into a single, easily managed solution. The Passport series effectively transports all of an enterprise's LAN, legacy data, telephony, and video traffic over leased lines, public or private frame relay, or asynchronous transfer mode (ATM).

The Passport 6400 series is complemented by the Passport 4400 series of Multiservice Access Switches and the Passport 7400 series of ATM multi-

service switches which provide high fanout point-of-presence (POP) solutions for service providers.

## Overview

### *Decreases total networking costs*

The Passport 6400 series consolidates data, voice, and video traffic onto a single network and supports a wide range of access and trunking options, providing both infrastructure and operational cost savings. Enterprises can use Passport to build private networks over leased lines, evolving existing time division multiplexing (TDM) networks and taking advantage of the QoS and multiservice capabilities offered by Passport. Passport seamlessly incorporates secure connections through public ATM or frame relay network services where bandwidth, cost, and improved business reach are required.





## **Benefits:**

**Decreases** total networking costs through network consolidation, voice compression, dynamic bandwidth allocation, differentiated Quality of Service (QoS), and extensive support of WAN services.

**Increases** network performance through multiprotocol switching and automatic routing of connection-oriented and connectionless traffic, flexible traffic management and shaping, and industry-leading congestion control and avoidance.

**Enables** flexible, reliable, and secure LAN/WAN network operation through integrated Virtual Private Networking (VPN) capabilities, advanced packet filtering and firewalls, and bulletproof, nonstop networking.

**Optimizes** network resources providing fast return on capital investment, powerful network management tools, and services monitoring.

**Future proofs** the enterprise network through evolution to carrier-managed services and newer technologies such as IP/MPLS.

The feature-rich voice services of Passport are a result of years of telephony experience. High-quality, low bit-rate voice compression and silence suppression reduce bandwidth consumption while maintaining high voice quality. Fax demodulation further ensures that bandwidth is not being used unnecessarily.

In addition, the Nortel Networks award-winning voice networking capability allows Passport to interpret public branch exchange (PBX) signaling protocols and route individual calls directly, instead of through a tandem PBX. This simplifies network design and improves end-to-end voice quality, providing operational cost savings.

### ***Increases network performance***

Designed for industry-leading performance, Passport maximizes the use of network resources and minimizes the impact of congestion and failures. A sophisticated traffic management system—Multiple Priority System (MPS)—allows optimization of resources, dynamically allocates bandwidth, reduces traffic congestion, and provides the least possible network latency to guarantee service levels for all traffic types.

InterLAN switching features include integrated switching and multiprotocol routing of LAN traffic as well as industry-leading packet filtering capabilities. These features are delivered on a distributed processor platform to ensure the highest possible performance even in the most secure environments. Passport also supports the industry's first commercially available Layer 3 switching technology.

Pioneered by Nortel Networks, Virtual Network Switching (VNS) eliminates the latency associated with network layer routing, provides network managers with the ability to partition the

WAN into Virtual Private Networks (VPNs), and simplifies the configuration and deployment of new network locations. VNS provides flexible cell and frame transport and improves LAN/WAN internetworking performance for Internet Protocol (IP) and Internet Protocol Exchange (IPX) routed traffic as well as all bridged traffic.

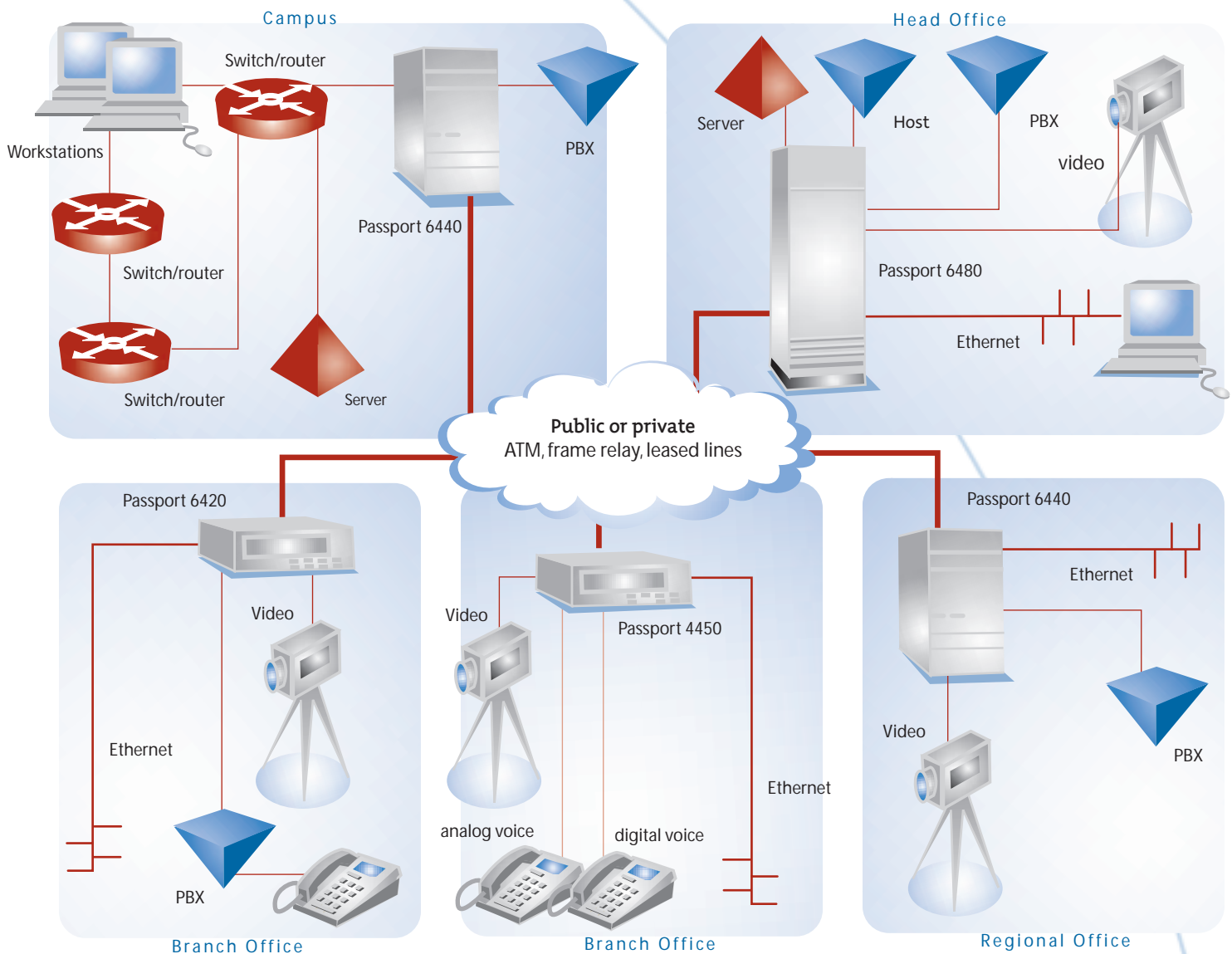
### ***Enables flexible, reliable, and secure LAN/WAN network operation***

The Passport 6400 series increases the flexibility of an enterprise network and extends connectivity options in private, public, and hybrid networks. In applications where public access provides a cost-effective alternative to private network infrastructures, the Passport 6400 series offers standards-compliant, secure, and seamless operation over public frame relay and ATM services. The high network reliability of Passport (up to 99.999 percent)—including redundant power and processor configurations—ensures its availability for mission-critical applications.

Passport 6400 products support NetSentry—industry-leading advanced packet filtering and firewall software. Using “seek and discover” parameters, the network is monitored for intrusions and, should they occur, notification is sent to the network management system for investigation. In addition to intrusion detection security, enterprise customers can create multiple intranets, partitioning sensitive corporate data from general access.

### ***Optimizes network resources***

Critical to any enterprise network is comprehensive network management—the ability to manage, monitor, and service alarms from anywhere in the network. The Passport 6400 series can be managed using one of Nortel Networks comprehensive support offerings designed to meet varying enterprise needs and operating models.



**Figure 1:** Example of the Passport 6400 series in a WAN environment.

### Future proofs the enterprise network

Changing times are the order of the day—especially in the data networking field. As enterprises realize the value of the network to their business, they are increasingly turning network management over to the service providers. The Passport 6400 series can be evolved with carrier-based software to enable this transition and to take advantage of new technologies such as IP/MPLS.

### Services and support

Nortel Networks comprehensive services and support portfolio provides enterprises with an extensive range of services around the globe. Services and support are available to assist in all aspects of a network—from its design to implementation and

ongoing operation. Nortel Networks has a range of services and support options to suit networks of all sizes and continues to evolve these services to meet customers' needs for responsive, high-quality support.

Nortel Networks supports networks in over 180 countries with support engineers worldwide.

### Award-winning enterprise networking

Passport state-of-the-art technology has gained international recognition through awards from trade journals and trade organizations—as well as through the satisfaction of our customers worldwide.



**Table 1: Passport 6400 Features**

<b>InterLAN switching</b>	<b>Transparent data support</b>
<ul style="list-style-type: none"> <li>- Network protocols including TCP/IP and Novell IPX,IPX RIP</li> <li>- Routing techniques including Routing Information Protocol (RIP/RIP V2), Border Gateway Protocol (BGP4), Exterior Gateway Protocol (EGP), and Open Shortest Path First (OSPF)</li> <li>- Bridging support including transparent bridging, source route bridging, source route transparent IEEE 802.9</li> <li>- Bridged Frame Routing (RFC 1499)</li> <li>- Security-advanced filtering facility (NetSentry)</li> <li>- RFC 1483 multiprotocol encapsulation over ATM</li> <li>- RFC 1490 multiprotocol connection over frame relay</li> <li>- Multiple virtual routers (Virtual Private Networks)</li> <li>- IP tunneling</li> <li>- VRRP (100BaseT)</li> <li>- IP Multicast (PIM-SM)</li> </ul>	<ul style="list-style-type: none"> <li>- Frame-aligned bit transparent connection</li> <li>- HDLC transparent connection</li> </ul>
<b>APPN support</b>	<b>Frame relay</b>
<ul style="list-style-type: none"> <li>- Network Node-dependent Logical Unit (LU) requester (DLUR)</li> <li>- High-performance routing</li> </ul>	<ul style="list-style-type: none"> <li>- High-speed interfaces</li> <li>- Differentiated traffic class management</li> <li>- Switched and permanent virtual circuits (SVC, PVC, SPVC)</li> <li>- Frame relay -ATM network interworking (FRF.5)</li> <li>- Frame relay -ATM service interworking (FRF.8)</li> <li>- Frame relay trace</li> <li>- Frame relay ISDN access - North America</li> </ul>
<b>ATM</b>	<b>Trunking</b>
<ul style="list-style-type: none"> <li>- Virtual channel and virtual path ATM switching SVC, SPVC, PVC, SPVP, SVP</li> <li>- ATM UNI/NNI</li> <li>- ATM dynamic trunk speed</li> <li>- Adaptation of all Passport-supported services to ATM</li> <li>- Wide range of ATM physical-layer interfaces</li> <li>- Traffic policing and shaping</li> <li>- ATM Forum QoS support (CBR, VBR-rt, VBR-nrt, UBR)</li> <li>- AAL1 structured and unstructured circuit emulation</li> <li>- LAN emulation client (LEC)</li> <li>- PNNI</li> <li>- IMA interoperability</li> <li>- Multiservice cut-through switching (MCS) over ATM</li> <li>- ATM Forum Traffic Management 4.0</li> </ul>	<ul style="list-style-type: none"> <li>- 9.6 kbps to 155 Mbps (OC-3c)</li> <li>- ATM, frame relay, frame/cell</li> </ul>
<b>Voice networking protocols</b>	<b>Robust routing</b>
<ul style="list-style-type: none"> <li>- ETSI Q.SIG on E1/DS1—Segmentation on E1</li> <li>- NIS on DSI</li> <li>- CAS (DTMF inband signaling) on all interfaces (T1/E1/TTC 2M)</li> <li>- Euro ISDN</li> <li>- Meridian MCDN</li> </ul>	<ul style="list-style-type: none"> <li>- Connection and connectionless routing are supported: LAN protocols and legacy data use a dynamic packet routing system (DPRS)</li> <li>- Voice and transparent data use a connection-oriented routing system (PORS)</li> </ul>
<b>Voice services</b>	<b>Physical interfaces</b>
<ul style="list-style-type: none"> <li>- ADPCM compression</li> <li>- 8 kbps voice compression (G.729)</li> <li>- 16 kbps voice compression (G.728)</li> <li>- Fax and modem tone detection</li> <li>- Speech Activity Detection (SAD or VAD)</li> <li>- Automatic voice/data call discrimination</li> <li>- Tandem Pass Through</li> <li>- Dialed digit /single hop routing (voice networking)</li> <li>- Voice accounting</li> <li>- Global interface support</li> </ul>	<ul style="list-style-type: none"> <li>- V.11 (X.21), V.35</li> <li>- DS1, E1 channelized and unchannelized</li> <li>- DS1, E1, TTC-2M voice</li> <li>- DS3, E3</li> <li>- HSSI</li> <li>- Ethernet (10BaseT, 100BaseT)</li> <li>- DS1, E1 ATM</li> <li>- DS3, E3 ATM</li> <li>- OC-3c, STM-1 ATM</li> <li>- J2 ATM</li> <li>- Combined control, Ethernet/Token Ring, and V.11/V.35</li> </ul>
	<b>Network management system</b>
	<ul style="list-style-type: none"> <li>- Comprehensive control of fault, performance, and configuration management</li> <li>- Application Programming Interfaces (APIs) for integration into other applications</li> <li>- On-switch spooling of alarms, statistics, accounting records, and logs</li> <li>- Network planning and analysis tools</li> <li>- Accounting</li> <li>- Service management</li> </ul>
	<b>Performance monitoring</b>
	<ul style="list-style-type: none"> <li>- Customized Service Level Agreement (SLA) reporting</li> <li>- Web-accessible</li> <li>- Service-oriented views of ATM, frame relay, voice, System - Network Architecture (SNA), and X.25</li> </ul>

**Table 2: Passport 6400 technical specifications**

Technical specifications			
	<i>Passport 6480</i>	<i>Passport 6440</i>	<i>Passport 6420</i>
Number of slots:	16	5	3
Aggregate throughput:	1.6 Gbps non blocking	1.6 Gbps non blocking	1.6 Gbps non blocking
Dimensions:			
Width:	24 in.(610 mm)	10.5 in.(267 mm)	16 in.(406 mm)
Depth:	27.3 in.(693 mm)	22 in.(559 mm)	19.2 in.(487 mm)
Height:	77.5 in.(1969 mm)	17.5 in.(445 mm)	6.25 in.(158 mm)
Power options:	AC and DC	AC and DC	AC
Redundant power:	Yes	Yes	N/A

### Acronym Glossary

AAL	ATM Adaption Layer	MPS	Multiple Priority System
ADPCM	Adaptive Differential Pulse Code Modulation	NNI	Network-to-Network Interface
API	Application Programming Interface	OC	Optical Carrier
ATM	Asynchronous Transfer Mode	OSPF	Open Shortest Path First
CAS	Channel Associated Signaling	PBX	Public Branch Exchange
DLUR	Dependent Logical Units Requester	POP	Point-of-Presence
DTMF	Dial Tone Multi Frequency	PVC	Permanent Virtual Circuit
ECMA	European Computer Manufacturers Association	QoS	Quality of Service
EGP	Exterior Gateway Protocol	QSIG	Q (point of the ISDN model) Signaling
FDDI	Fiber Distributed Data Interface	RFC	Request For Comment
FRF	Frame Relay Forum	RIP	Routing Information Protocol
HSSI	High-Speed Serial Interface	SLA	Service Level Agreement
IDLC	Integrated Digital Loop Carrier (Telephony)	SNA	System Network Architecture
IEEE	Institute of Electrical and Electronics Engineers	SNMP	Simple Network Management Protocol
IMA	Inverse Multiplexing for ATM	SPVC	Switched Permanent Virtual Circuit
IP	Internet Protocol	SVC	Switched Virtual Circuit
IPX	Internet Protocol Exchange	TCP	Transmission Control Protocol
ISDN	Integrated Services Digital Network	TDM	Time Division Multiplexing
LAN	Local Area Network	UNI	User Network Interface
LU	Logical Unit	VNS	Virtual Network Switching
		VPN	Virtual Private Network
		WAN	Wide Area Network



For more information, contact your Nortel Networks representative, or call 1-800-4 NORTEL (1-800-466-7835) from anywhere in North America, or 1-506-674-5470 outside North America.

[www.nortelnetworks.com](http://www.nortelnetworks.com)

**United States:**

Nortel Networks  
35 Davis Drive  
Research Triangle Park,  
North Carolina 27709  
USA

**Canada:**

Nortel Networks  
8200 Dixie Road, Suite 100  
Brampton, Ontario L6T 5P6  
Canada  
1-800-466-7835

**Caribbean and Latin America**

Nortel CALA Inc.  
1500 Concord Terrace  
Sunrise, FL 33323-2815  
USA  
954-851-8000

**Europe, Middle East,  
and Africa**

Nortel Networks EMEA, S.A.  
Les Cyclades-Immeuble Naxos  
25 Allee Pierre Ziller  
Valbonne, 06560 France  
+33-4-92-96-69-66

**Asia Pacific**

Nortel Networks  
6/F, Cityplaza 4  
12 Taikoo Wan Road  
Takoo Shing  
Hong Kong  
852-2100-2888

Nortel Networks, the Nortel Networks logo, the globemark design, Meridian, and Passport are trademarks of Nortel Networks Corporation. All other trademarks are the property of their owners.

Copyright © 2001 Nortel Networks Corporation. All rights reserved. Information in this document is subject to change without notice. Nortel Networks assumes no responsibility for any errors that may appear in this document.

**PB3728-C/12-01**