



## ›THIS IS THE WAY

SERVICE PROVIDERS COST-EFFECTIVELY CONNECT

THOUSANDS OF BUSINESS USERS TO THEIR DATA NETWORK

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### Product Brief

#### Nortel Multiservice Switch 7400 Series

Service providers are challenged to generate service revenue with maximum profit while delivering unsurpassed quality and reliability. They must also be responsive to customer requirements, technology changes and market trends to remain competitive and to preserve their customer base. These three dynamics can add a great deal of stress to daily operations and force churn continuously within the service delivery network. To meet the requirements of achieving services profitability, easing technology evolution and delivering a reliable service, Nortel offers the Multiservice Switch (MSS) 7400.

#### What is the Multiservice Switch 7400?

Nortel's Multiservice Switch 7400 is a series of multiservice switches designed to deliver services at the edge of a service provider's network. The MSS 7400 is ideal for service adaptation and can perform backbone switching for most provider networks. It enables the service provider to cut the total cost of ownership by consolidating multiple data and voice transport networks. With one MSS 7400 switch, service providers

can efficiently provision Layer 2 (ATM, frame relay, Ethernet), Layer 3 (IP, IP-VPN), circuit emulation and voice services. All of these services can take advantage of sophisticated traffic prioritization and quality of service (QoS) capabilities for premium levels of Service Level Agreements (SLAs).

#### Why the Multiservice Switch 7400?

By choosing a product from the Multiservice Switch 7400 series, service providers will benefit from its modular design and rich feature set to deliver

profitable services. An investment in the MSS 7400 series is protected from technology and customer growth changes, which typically require a wholesale hardware replacement. The MSS 7400 also protects investment outside of the direct purchase of the equipment. Expenses including sales, engineering and operations training are preserved throughout the lifecycle of the product. Finally, the MSS 7400 series is supported by an intelligent management system that will offer ease of support and quick service provisioning to maximize service revenue.



## Profitable services

The MSS 7400 switch enables you to deliver multiple services on a single switch. For instance, traditional Layer 2 services (e.g., ATM, frame relay and Ethernet) — with full feature capabilities including ATM Inverse Multiplexing and frame relay class of service — can co-exist with new revenue opportunities addressable with the support of Layer 3 services (e.g., IP-VPN services based on RFC 2547bis and RFC 2764 IP standards). By reusing the same platform to turn up new revenue-generating services through simple software provisioning, service providers have the flexibility to reduce their networking costs and therefore increase their profitability.

## Flexible evolution

MSS 7400s are populated with fully interchangeable cards, any service/any port capability and channelized DS1/E1 to OC-3/STM-1 interfaces. The MSS 7400 is available in four configurations with 3, 5, 8 or 16 slots to accept the dozens of processor cards available. The MSS 7400 also features the MSA32 line card, which provides industry-leading physical port density and simultaneous support for multiple services. The MSA32 multiservice capability significantly improves network flexibility leading to greater operational simplicity.

The Multiservice Switch 7400 is also utilized for next-generation packet voice and wireless networking as well as for voice over IP and voice over ATM applications for converged voice-data networking.

In addition, the MSS 7400 is also deployed as part of next-generation wireless networks spanning TDMA, GSM/GPRS/UMTS and CDMA/CDMA 2000 applications. It is especially attractive for wireless access backhaul and aggregation applications which require a high concentration of functions in a small footprint.

## Proven reliability

MSS delivers carrier-grade reliability for both hardware and software, even in networks with more than 3,000 nodes. It limits downtime, so there is virtually no impact to services during equipment outages or software migration. And MSS extends existing Layer 2 OAM&P capabilities to Layer 3 services while meeting “real-time” regulatory requirements for public services. Designed for the rigors of the service provider environment, MSS 7400 products offer high node availability through fully redundant, “hot-swappable” common equipment. In addition, MSS 7400 offers cost-effective reliability and availability through physical interface and line sparing with optional SONET APS/SDH MSP protection for optical interfaces, and 1:1 or 1:N sparing for electrical interfaces.

MSS networking ensures cost-effective operations through intelligent features such as Private Network-to-Network Interface (PNNI) Edge-based Rerouting

and MPLS Hot Standby LSPs (label switched paths), which provide effective fault recovery and route optimization at all times.

## Comprehensive network management

The Nortel Multiservice Data Manager (MDM) is an open, flexible network management system that provides the operational tools to profit from the advantages offered by MSS. MDM facilitates the integration of MSS into the network and operating environment, efficiently runs operations and assists in realizing service revenue potential. With the Multiservice Data Manager, network operators can take advantage of comprehensive fault management, simplified service provisioning and detailed configuration management.

Together with Management Data Provider, the Multiservice Data Manager delivers an extensive set of data for usage billing — enabling rigorous SLA reporting that enhances customer trust. Nortel Multiservice Data Manager is designed to be easily integrated with OSS systems in the service provider's management environment to further complement their service fulfillment, assurance and billing functions.



Multiservice Switch 7420



Multiservice Switch 7440



Multiservice Switch 7460



Multiservice Switch 7480

## Key technical specifications — services

### *ATM services*

- SVCs, SPVPs, SPVCs, PVPs and PVCs
- UNI 3.0, 3.1, 4.0 with interworking ILMI 4.0
- Point-to-multipoint (logical and spatial)
- Inverse multiplexing over ATM (IMA)  $n \times DS-1/E1$
- VPT (Virtual Path Termination)

### *ATM traffic management services*

- ATMF service categories: CBR, VBR (rt/nrt), UBR, UBR with MDCR

### *Shaping and UPC enhancements*

- Dual leaky bucket traffic shaping (inverse UPC)
- Separate statistics for GCRA1 and GCRA2 UPC violations

### *Congestion management*

- EPD/PPD/LPD, W-RED (per connection, virtual circuits in virtual path)
- AAL5 auto detection

### *Advanced queuing and scheduling*

- Eight quality of service classes per link/channel
- Per connection WFQ (weighted fair queuing) for each class

### *Performance monitoring*

- Cell loss ratio, availability ratio, cell transfer delay

### *ATM networking*

- PNNI, AINI, IISP
- SPVCs and SPVPs across UNI, AINI, PNNI and IISP interfaces
- H-PNNI support
- PNNI DBR (Domain-based re-routing)
- PNNI path and connection trace
- Specified paths over PNNI and H-PNNI
- PNNI over IMA

### *Ethernet services*

- Bridged Ethernet over ATM (E-Line)
- Ethernet VLAN and port crossconnect capability
- Ethernet Policing and p-bit aware QoS

### *MPLS support*

- Signaling: LDP-DU, RSVP-TE, RFC 2547 MP-BGP IP-VPN extensions
- Routing: OSPF, ISIS
- LER and LSR MPLS networking

### *Circuit emulation services*

- ATM CES 2.0 (AAL-1)
- Structured and unstructured services
- PVCs, CES signaling over SVCs and SPVCs

### *IP services*

- IP-VPNs for intranet service, VPN access
- IP class of service
- Differentiated Services (RFC2474)
- Routing protocols: OSPF, RIPv2, BGP-4, IS-IS
- IP-VPN over ATM (RFC2764) or MPLS (RFC2547)
- Virtual Lan (VLAN)
- Virtual Router Redundancy Protocol (VRRP)
- IP accounting
- IP Policing
- MD5 authentication for OSPF, BGP, LDP

### *Frame relay services*

- FR UNI and NNI (FRF.1, FRF. 2) (ITU-T, ANSI, Frame Relay and Vendor Forum)
- Frame relay usage-based accounting and detailed statistics
- X.121 and E.164 addressing schemes
- PVCs and SVCs
- Closed user groups (CUGs), signaled per DLCI and per port
- SVC call redirection and hunt-groups (FRF.4)
- FR-ATM service and network interworking (FRF.8 and FRF.5)
- Fragmentation and reassembly for delay reduction (FRF.12)

### *Packet voice services*

- VoATM (AAL-1 or AAL-2) and VoIP options
- Toll-quality voice encoding, ITU-T G.711 PCM, G.726 ADPCM or G.729 CS-ACELP
- Silence suppression, comfort noise generation and dynamic downspeaking
- Congestion management
- 56/64 kbps clear-channel fax and modem support
- ITU-T G.165- and G.168-compliant echo cancellation: ITU-T G.164 and G.165-compliant tone detection
- ETSI QSIG, Euro ISDN, NIS, CAS and MCDN signaling

## Key technical specifications — physical

### Interfaces

- Control Processor with and without BITS interface

### ATM UNI/NNI interfaces

- 8 port DS1/E1 IMA
- 3 port DS3/E3
- 2 and 3 port OC-3/STM-1 Single Mode and Multimode
- 2 port STM-1 electrical
- 2 port STM-1 electrical channelized (ATM, IMA, CES)

### Circuit emulation

- 4 port DS1/E1 AAL1
- 2 port STM1 electrical channelized

### Ethernet interfaces

- 6 port 10Base-T
- 2 port 100Base-T
- 4 port 10/100 Base-T
- 8 port 10/100Base-T

### Frame relay interfaces

- 8 port V.35
- 8 port V.11
- 4 port E1
- 4 port DS1/E1 channelized
- 8 port DS1
- 1 port DS3/E3
- 1 port DS3 channelized
- 1 port HSSI

### Multiservice access interface

- Any service including ATM, FR, FRATM, FR-NNI, FR ISDN dialup, HTDS, AAL1 CES and IP; any channel
- 32 port DS1/E1 channelized
- 32 port DS1/E1 channelized with dual STM-1/OC-3 ports (Singlemode, Multimode)
- 32 port DS1/E1 channelized single slot

### Voice interfaces

- 1 port DS1/E1/TTC2M
- 4 port DS1/E1/TTC2M
- Voice Service Processor AAL2

### TDM interfaces

- 2 port DS3/E3c
- 32 port E1

### Server cards

- VPN Extender Architecture and capacity
- Multi-processor architecture
  - MSS 7480: 16-slot shelf, variant
  - MSS 7460: 8-slot shelf, variant
  - MSS 7440: 5-slot shelf, variant
  - MSS 7420: 3-slot shelf, variant
- 1.6 Gbps load sharing bus architecture

### Mounting options

- Nortel supplied cabinet or standard 19" EIA/IEC rack

### Packaging

#### MSS 7420 (DC only)

- Complete shelf unit dimensions (h x w x d): 133 mm x 492 mm x 524 mm (5.25" x 16" x 21")

#### MSS 7440

- Complete shelf unit dimensions (h x w x d): 445 mm x 267 mm x 559 mm (17.50" x 10.50" x 22")
- Cabinet dimensions: 1969 mm x 610 mm x 693 mm (77.50" x 24" x 27.30")

#### MSS 7460 (DC only)

- Complete shelf unit dimensions (h x w x d): 355 mm x 483 mm x 495 mm (14" x 19" x 19.5")

#### MSS 7480

- Complete shelf unit dimensions (h x w x d): 972 mm x 483 mm x 553mm (38.25" x 19" x 21.75")
- Cabinet dimensions: 1969 mm x 610 mm x 693 mm (77.50" x 24" x 27.25")
- Seismic cabinet (NEBS Zone 4) 1970 mm x 600 mm x 790 mm (78" x 24" x 31")
- Universal Frame: 2120.50 mm x 600 mm x 600 mm (83.66" x 23.62" x 23.62")

### Power

- -48 VDC/-60 VDC nominal voltage
- AC power option available Standards compliance

### Safety

- CSA C22.2 no. 950, EN 60950, UL 1950 EMC
- EN 55022/FCC Part 15B Class A, EN 50082-1 Seismic
- Up to Zone 4

Nortel is a recognized leader in delivering communications capabilities that enhance the human experience, ignite and power global commerce, and secure and protect the world's most critical information. Serving both service provider and enterprise customers, Nortel delivers innovative technology solutions encompassing end-to-end broadband, Voice over IP, multimedia services and applications, and wireless broadband designed to help people solve the world's greatest challenges. Nortel does business in more than 150 countries. For more information, visit Nortel on the Web at [www.nortel.com](http://www.nortel.com).

For more information, contact your Nortel representative, or call 1-800-4 NORTEL or 1-800-466-7835 from anywhere in North America.

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