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## Portfolio Brief

### Nortel VPN Routers

Nortel VPN Routers (formerly known as Contivity\* Secure IP Services Gateway) are a next-generation family of products delivering security and IP services in a single integrated platform. Targeted at the wide-area network (WAN) edge — the intersection of an enterprise's private and public IP networks — the Nortel VPN Router family is optimized to exploit the cost advantages of the Internet while providing secure communications across the public IP infrastructure. A single Nortel VPN Router device provides IP routing, IPSec and SSL-based Virtual Private Networking (VPN), stateful

firewall, encryption, authentication and bandwidth management services in a highly-integrated platform.

With a comprehensive set of secure IP services, the Nortel VPN Router offers what normally takes multiple purpose-built IP and security devices to deliver. Enterprises can deploy it as a VPN gateway, IP access router or stateful firewall device. A flexible software licensing system further allows them to turn up new services as they are needed. For example, the Nortel VPN Router can be installed initially as an IP access router, then VPN or firewall services can be added later via a simple license key.

This allows quick deployment of needed services today with the flexibility to add new ones in the future — all without costly hardware upgrades.

Built on Nortel's Secure Routing Technology (SRT) framework, the Nortel VPN Router is designed with security inherent across all its operations. SRT integrates the major functional components of the Nortel VPN Router — such as management, access, routing and policies — weaving a consistent security structure across these services. This provides scalability and high performance even when running multiple IP services in the same device.

#### The need for secure IP services

The rise of the Internet and IP-based applications provides enterprises with a unique opportunity to realize cost savings in their external and internal communications. But the Internet was not originally designed with security in mind. Enterprises with mission-critical Internet applications must secure the data they transmit, as well as protect their internal networks from outside intrusion. Legacy routers — the traditional means of Internet connection — do not easily scale to meet needed security requirements without expensive add-ons and performance overhead. Nortel VPN Routers are architected to deliver the security required by enterprise IP networks with the ability to scale to address a complete range of high-performance IP services.



With a portfolio ranging from low-end Nortel VPN Router 200 to high-end Nortel VPN Router 5000, Nortel VPN Router devices can handle the needs of the smallest branch site to those of the largest headquarters, and every environment in between. Its broad range of LAN/WAN interface options makes it an easy fit into existing enterprise networks.

### Security built into the design

Virtual Private Networking and security are hallmarks of the Nortel VPN Router product line. Nortel VPN Router devices are designed with security in mind — both in the secure transmission of data, as well as in the inherent security of the device and its management interface. For example, by default, the Nortel VPN Router denies all access on the public (or “secure routing”) interface, except via a secure management tunnel. Extensive Denial of Service (DoS) protection is also provided on this interface. This limits exposure to attacks from the public Internet even before the Nortel VPN Router has been configured for IP services operation. Also, there are no “back doors” on the Nortel VPN Router to circumvent device login. This security is built in, regardless of whether the Nortel VPN Router is installed as a basic IP access router or as a dedicated VPN switch or firewall.

### Network evolution, not revolution

Since it is standards-based, the Nortel VPN Router interoperates with existing routing, authentication, directory, and security services. This means the Nortel VPN Router can bridge the transition during the introduction of new IP services into the network. Nortel VPN Router devices can be initially installed behind an existing IP access device (router, DSL modem, etc.) without disruption to the network. Or, an enterprise deploying the Nortel VPN Router as a VPN gateway can later add firewall services and/or transition the Nortel VPN Router to the primary Internet access device for that site.

### Features

#### Best-in-class Virtual Private Networking (VPN)

As a market leader in IP Virtual Private Networking (IP-VPN), the Nortel VPN Router has been delivering on the promise of end-to-end secure IP-VPNs for years. IP-VPN capabilities are standard in every Nortel VPN Router unit, with all base configurations shipping with a minimum of five VPN tunnels.

All the Nortel VPN Routers include the following VPN capabilities:

- **Standards-based tunneling** — Support for IPSec, L2TP and PPTP standard tunneling protocols provides interoperability with a wide range of multi-vendor VPN software and hardware.
- **Encryption** — Support for DES, 3DES and Advanced Encryption Standard (AES) standard provides ultimate end-to-end security for transmitted data.
- **Authentication** — Support for RADIUS, LDAP, SecureID, X.509 digital certificates, as well as token and smart cards offering the broadest range of authentication options in the industry. Enterprises can leverage their existing enterprise directory-based services, whether Novell NDS or Microsoft Active Directory, or design their own secure authentication mechanism.
- **Comprehensive VPN client support** — Nortel VPN Client (formerly known as Contivity VPN Client) software for MS-Windows systems, including Windows 95, 98, 2000, NT, Millennium and XP, is provided free of charge with every Nortel VPN Router unit. Nortel's VPN Clients are also available for UNIX, Macintosh and Pocket PC operating systems. Secure access from wireless and hand-held devices is additionally supported via third-party IPSec clients.

## Mobilizing your IPSec VPN with the Nortel VPN Router

With over 60 million IPSec VPN clients deployed globally, Nortel customers now have the option of extending their remote access IPSec VPNs with Nortel's innovative IPSec Mobility capability.

IPSec Mobility allows a laptop, PDA or tablet PC user to move from one physical location to another while maintaining a persistent Nortel VPN Router IPSec VPN connection. Users do not need to re-login or restart applications as they roam from place to place. For example, a user can move from an Ethernet to a wireless LAN or even to a public wide-area Wi-Fi environment without “breaking” their VPN tunnel connection and having to restart applications.

IPSec Mobility enables Nortel VPN Router customers to “mobilize” applications so that users can roam from location to location — all while maintaining a secure connection.



## Integrated SSL and IPSec remote access

The Nortel VPN Router uniquely delivers hybrid SSL/IPSec services through its SSL VPN Module 1000. The module provides SSL-based remote access to enterprises' remote employees, partners and customers within a Nortel VPN Router device — further leveraging the same authentication and administrative mechanisms used for IPSec users. The SSL VPN module takes limiting and complex technology choices “off the table” by allowing enterprises to deploy solutions that meet their broad deployment requirements (IPSec and SSL) — rather than forcing them to choose one technology or protocol over another.

### SSL VPN Module

The Nortel SSL VPN Module 1000 offers fully-featured third-generation Secure Sockets Layers (SSL) VPN services on the Nortel VPN Router. Available as an option on the Nortel VPN Router 1750, 2700 and 5000 models, the SSL VPN module delivers new tightly-integrated SSL/IPSec services to enterprises, while enabling Nortel VPN Router customers to incrementally add SSL remote access into their existing Nortel VPN Router devices. SSL is a convenient secure remote access alternative to IPSec that leverages the native capabilities of widely deployed Web browsers and avoids the need to install and administer client tunneling software on remote PCs.

The SSL VPN Module 1000 incorporates dedicated SSL processor, memory and accelerator hardware to deliver uncompromising levels of performance and scalability without adversely impacting other key functions on the Nortel VPN Router platform. SSL services can take advantage of common user profiles, authentication techniques and management already in place for IPSec users to minimize administrative overhead. An integrated Universal Access Portal further front-ends and simplifies the VPN user experience by transparently invoking the most appropriate VPN access (IPSec or SSL) based on a user's access needs.

### Stateful firewall

The Nortel VPN Router stateful firewall combines an easy-to-use interface with rich filtering rule sets to provide multiple lines of defense for an enterprise's private network. With extensive logging, a wide

range of application layer gateways (ALGs) and built-in protection against hacker attacks, the Nortel VPN Router stateful firewall delivers wire-speed throughput while protecting the enterprise network and its data from unauthorized access. The Nortel VPN Router stateful firewall can further be combined with VPN termination and network address translation (NAT) services to flexibly apply filtering policies to data sent across either tunneled or non-tunneled interfaces.

### Endpoint security through VPN Tunnel Guard

Nortel's VPN Tunnel Guard helps to prevent end-user PCs from becoming a vehicle for viruses or other unwanted intrusions through the VPN tunnel. Available as a standard VPN Router feature, Tunnel Guard enables the administrator to define endpoint security policies for end-user PCs connecting to the VPN Router. It then ensures all remote users/devices are inspected for compliance to the security policy before allowing access through the VPN tunnel. VPN Tunnel Guard can enforce endpoint security for both client-based (IPSec) and clientless (SSL) VPN endpoints.

### Secure routing services

Standards-based IP routing services enable the Nortel VPN Router to be integrated into an existing router network, or be deployed on its own to build a highly redundant and flexible secure network. With support for Open Shortest Path First (OSPF), Routing Information Protocol (RIPv1 and v2), Border Gateway Protocol (BGP-4) and Virtual Route Redundancy Protocol (VRRP), the Nortel VPN Router can dynamically route traffic

around failed connections or devices, as well as load balance traffic across parallel paths — whether for tunneled or non-tunneled traffic. Secure Routing Technology (SRT) on the Nortel VPN Router avoids complex encapsulation protocols and associated overhead when forwarding IP traffic through secure IP VPN tunnels. The Nortel VPN Router additionally offers industry-standard Data Link Switching (DLSw) services to transport and encrypt SNA traffic over public or private IP networks.

### Bandwidth management/ Quality of Service

Powerful Quality of Service (QoS) features allow the Nortel VPN Router to deliver on the promise of highly-optimized IP networks. With advanced services — Differentiated Services (DiffServ), RSVP and sophisticated queue management — the Nortel VPN Router can ensure that service levels are met for any mission-critical data. The Nortel VPN Router can prioritize traffic not only by IP traffic type, but also prioritize by users, groups and VPN tunnels, allowing fine granularity in QoS control. By reserving minimum guaranteed bandwidth, the Nortel VPN Router ensures that an individual user's bandwidth is preserved in a multi-user environment.

### LAN/WAN flexibility

With integrated support for 10/100/1000 Mbps Ethernet, frame relay, PPP, T1 and E1 CSU/DSU, V.35, X.21, ADSL, ISDN and V.90 modem interfaces, the Nortel VPN Router offers great flexibility in its placement within the enterprise network. It can act as the primary WAN/Internet access device via frame relay, dial-up or

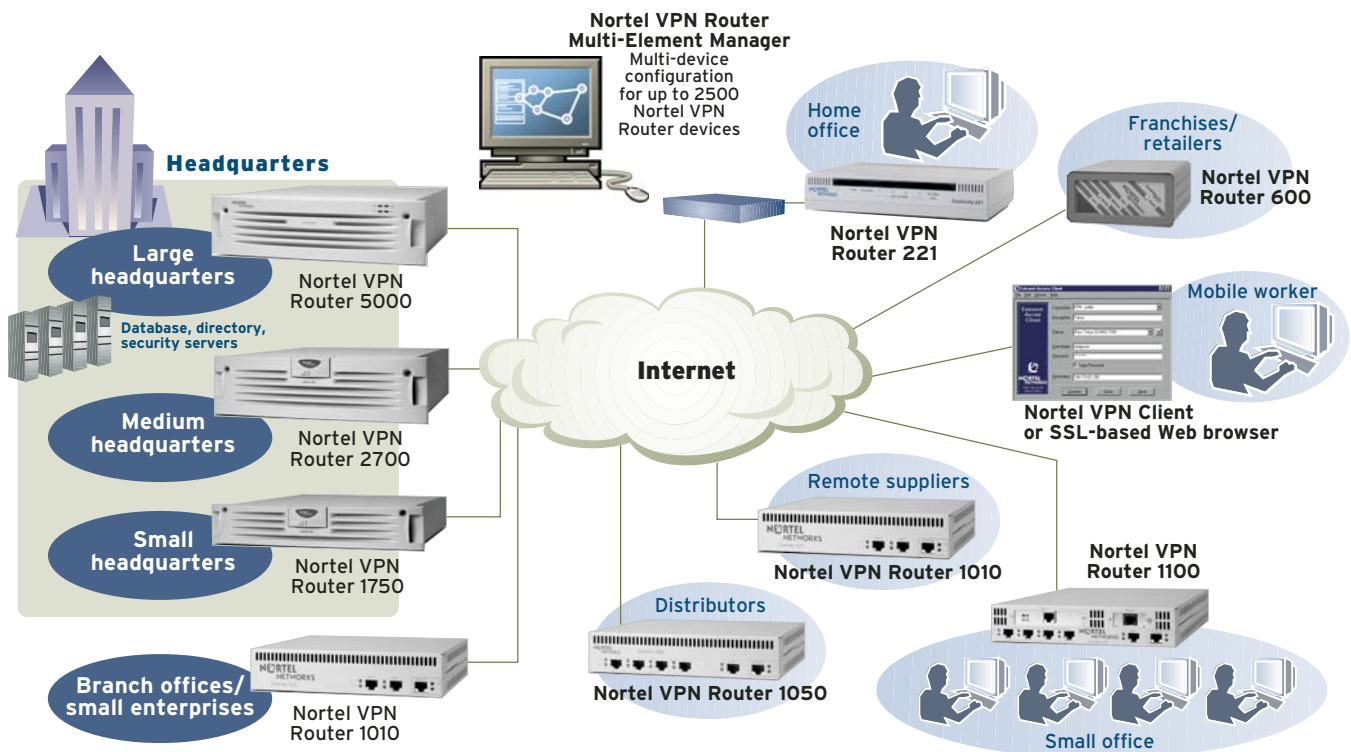
leased line connection or be connected to an existing WAN or Internet access device via its standard Ethernet interface. Dial back-up services allow traffic to be sent over an alternate connection in case the primary WAN or LAN link fails.

### Comprehensive management services

A rich set of integrated management tools makes it easy for enterprises or service providers to configure and monitor Nortel VPN Router devices. These include:

- **Provisioning** — The Nortel VPN Router Multi-Element Manager (formerly known as Contivity Configuration Manager [CCM]) allows multi-element provisioning of up to 2,500 Nortel VPN Router systems across a large network infrastructure. Embedded Web-based and command-line interfaces allow quick configuration of single Nortel VPN Router devices.
- **Remote management options** — Allow the Nortel VPN Router to be provisioned from a data center or network operations center (NOC).
- **Easy Install Utility** — Provides automated set-up of a remote VPN Router via a Web browser, eliminating the need for an on-site installer.
- **Fault management** — SNMP, alarm monitor and historical fault browser quickly detect problems.
- **Accounting** — A rich set of security and system logging tools lets administrators track all transactions and events.

## The Nortel VPN Router architecture





## Technical specifications — branch/home office models



Nortel VPN Router 221/251	Nortel VPN Router 1010/1050	Nortel VPN Router 1100	Nortel VPN Router 600
Up to 5 tunnels	Up to 30 tunnels	Up to 30 tunnels	Up to 50 tunnels
<p><b>Processor/memory</b></p> <ul style="list-style-type: none"> <li>• 221 — 100 MHz MIPS processor 4MB Flash – 16 MB RAM</li> <li>• 251 — 166 MHz ARM processor 4MB flash – 16 MB RAM</li> </ul> <p><b>Max 3DES throughput</b></p> <ul style="list-style-type: none"> <li>• 4.5 Mbps 3DES throughput</li> </ul> <p><b>Standard equipment</b></p> <ul style="list-style-type: none"> <li>• <i>Nortel VPN Router 221</i> <ul style="list-style-type: none"> <li>– 10/100 Mbps Ethernet</li> <li>– 4 port 10/100 Mbps Auto-sensing Ethernet switch</li> <li>– Console port (RS-232, DB-9f)</li> </ul> </li> <li>• <i>Nortel VPN Router 251</i> <ul style="list-style-type: none"> <li>– 4 port 10/100 Mbps Auto-sensing Ethernet switch</li> <li>– ADSL - G.992.1, Annex A, Annex B or UR-2</li> <li>– Console port (RS-232, DB-9f)</li> </ul> </li> </ul> <p><b>Standard software</b></p> <ul style="list-style-type: none"> <li>• Nortel VPN Router 221/251 O/S with 5 VPN tunnels and IP routing</li> </ul> <p><b>Physical dimensions</b></p> <p><i>Nortel VPN Router 221</i></p> <ul style="list-style-type: none"> <li>• Length: 7.4 in. (188 mm)</li> <li>• Width: 5 in. (128 mm)</li> <li>• Height: 1.4 in. (36 mm)</li> <li>• Weight: 10.9 oz (310 gms.)</li> </ul> <p><i>Nortel VPN Router 251</i></p> <ul style="list-style-type: none"> <li>• Length: 9.1 in. (230 mm)</li> <li>• Width: 6.3 in. (161 mm)</li> <li>• Height: 2.1 in. (53 mm)</li> <li>• Weight: 1.0 oz (468 gms.)</li> </ul>	<p><b>Memory</b></p> <ul style="list-style-type: none"> <li>• 128 MB RAM; 64 MB Flash</li> </ul> <p><b>Processor</b></p> <ul style="list-style-type: none"> <li>• 300 MHz Celeron</li> </ul> <p><b>Encrypted VPN throughput</b></p> <ul style="list-style-type: none"> <li>• 15 Mbps (3DES)</li> <li>• 30 Mbps (AES)</li> </ul> <p><b>Standard equipment</b></p> <p><i>Nortel VPN Router 1010:</i></p> <ul style="list-style-type: none"> <li>• 2 x 10/100BaseT Ethernet ports</li> <li>• Management/console port (DB-9)</li> </ul> <p><i>Nortel VPN Router 1050:</i></p> <ul style="list-style-type: none"> <li>• 1 x 10/100BaseT Ethernet ports</li> <li>• 4-port 10/100 Ethernet switch</li> <li>• Management/console port (DB-9)</li> </ul> <p><b>Standard software*</b></p> <ul style="list-style-type: none"> <li>• Nortel VPN Router O/S with 5 VPN tunnels and IP routing</li> </ul> <p><b>Physical dimensions</b></p> <ul style="list-style-type: none"> <li>• Length: 8 in. (20.3 cm)</li> <li>• Width: 8.5 in. (21.6 cm)</li> <li>• Height: 1.75 in. (4.4 cm)</li> <li>• Weight: 2.7 lb (1.2 kg)</li> </ul> <p><b>Operating environment</b></p> <ul style="list-style-type: none"> <li>• Electrical: 100-240 VAC, 50-60 Hz</li> <li>• Temperature: 32°-104°F (0°-40°C)</li> <li>• Relative humidity: 10-90% non-condensing</li> </ul>	<p><b>Memory</b></p> <ul style="list-style-type: none"> <li>• 128 MB RAM; 64 MB Flash</li> </ul> <p><b>Processor</b></p> <ul style="list-style-type: none"> <li>• 300 MHz Celeron</li> </ul> <p><b>Expansion slots</b></p> <ul style="list-style-type: none"> <li>• Two PCI expansion slots</li> </ul> <p><b>Encrypted VPN throughput</b></p> <ul style="list-style-type: none"> <li>• 15 Mbps (3DES)</li> <li>• 30 Mbps (AES)</li> </ul> <p><b>Standard equipment</b></p> <ul style="list-style-type: none"> <li>• 1 x 10/100BaseT Ethernet ports</li> <li>• 4-port 10/100 Ethernet switch</li> <li>• Management/console port (DB-9)</li> </ul> <p><b>Standard software*</b></p> <ul style="list-style-type: none"> <li>• Nortel VPN Router O/S with 5 VPN tunnels and IP routing</li> </ul> <p><b>LAN/WAN options</b></p> <ul style="list-style-type: none"> <li>• Additional 10/100BaseT Ethernet</li> <li>• T1/E1 with CSU/DSU</li> <li>• V.90 Dial Modem</li> <li>• ISDN BRI (S/T and U interfaces)</li> <li>• ADSL</li> <li>• V.35/X.21/RS-232 Serial</li> <li>• 56/64K CSU/DSU</li> </ul> <p><b>Physical dimensions</b></p> <ul style="list-style-type: none"> <li>• Length: 10.5 in. (26.9 cm)</li> <li>• Width: 8.5 in. (21.6 cm)</li> <li>• Height: 1.75 in. (4.4 cm)</li> <li>• Weight: 3.8 lb (1.7 kg)</li> </ul> <p><b>Operating environment</b></p> <ul style="list-style-type: none"> <li>• Electrical: 100-240 VAC, 50-60 Hz</li> <li>• Temperature: 32°-104°F (0°-40°C)</li> <li>• Relative humidity: 10-90% non-condensing</li> </ul>	<p><b>Memory</b></p> <ul style="list-style-type: none"> <li>• 128 MB</li> </ul> <p><b>Processor</b></p> <ul style="list-style-type: none"> <li>• 300 MHz Celeron</li> </ul> <p><b>Expansion slots</b></p> <ul style="list-style-type: none"> <li>• One PCI expansion slot</li> </ul> <p><b>Encrypted VPN throughput</b></p> <ul style="list-style-type: none"> <li>• 15 Mbps (3DES)</li> <li>• 30 Mbps (AES)</li> </ul> <p><b>Standard equipment</b></p> <ul style="list-style-type: none"> <li>• 2 x 10/100BaseT Ethernet ports</li> <li>• Management/console port (DB-9)</li> </ul> <p><b>Standard software*</b></p> <ul style="list-style-type: none"> <li>• Nortel VPN Router O/S with 50 VPN tunnels and IP routing</li> </ul> <p><b>LAN/WAN options</b></p> <ul style="list-style-type: none"> <li>• Additional 10/100BaseT Ethernet</li> <li>• T1/E1 with CSU/DSU</li> <li>• V.90 Dial Modem</li> <li>• ISDN BRI (S/T and U interfaces)</li> <li>• ADSL</li> <li>• V.35/X.21/RS-232 Serial</li> <li>• 56/64K CSU/DSU</li> </ul> <p><b>Physical dimensions</b></p> <ul style="list-style-type: none"> <li>• Length: 11 in. (27.9 cm)</li> <li>• Width: 8.5 in. (21.6 cm)</li> <li>• Height: 4.0 in. (10.2 cm)</li> <li>• Weight: 6.0 lb (2.9 kg)</li> </ul> <p><b>Operating environment</b></p> <ul style="list-style-type: none"> <li>• Electrical: 90-264 VAC, 50-60 Hz</li> <li>• Temperature: 32°-131°F (0°-55°C)</li> <li>• Relative humidity: 5-85% non-condensing</li> </ul>

### Optional software licenses (for 1000 series and up)

- Nortel VPN Router Stateful Firewall
- Nortel VPN Router Advanced Routing (OSPF, VRRP, bandwidth management)
- Nortel VPN Premium Routing (Advanced Routing plus BGP-4)
- Nortel VPN Client for MAC and UNIX
- Nortel VPN Router VPN Tunnel Upgrades (from 5 to max tunnels) available for Nortel VPN Router 1000 series, 1750 and 2700 models
- Nortel VPN Router Data Link Switching (DLSw)

\*Nortel VPN Client for Windows (with unlimited distribution license) included with Nortel VPN Router 1000 series and up.

## Technical specifications — corporate/enterprise models



### Nortel VPN Router 1750

Up to 500 tunnels

#### Memory

- Standard: 128 MB
- Maximum: 256 MB

#### Processor

- 850 MHz Pentium III

#### Expansion slots

- Four PCI expansion slots

#### Encrypted VPN throughput

- 125 Mbps (3DES)
- 150 Mbps (AES)

#### Standard equipment

- 2 x 10/100BaseT Ethernet ports
- Management/console port (DB-9)

#### Standard software\*

##### *Secure Router Bundle:*

- Nortel VPN Router O/S with 5 VPN tunnels and IP routing

##### *VPN Bundle:*

- Nortel VPN Router O/S with 500 VPN tunnels and IP routing

#### LAN/WAN options

- Additional 10/100BaseT Ethernet
- 1000BaseSX/T (GigE) Ethernet
- 1-port T1/E1 CSU/DSU
- 4-port T1/E1 CSU/DSU
- V.90 Dial Modem
- ISDN BRI (S/T and U interfaces)
- ADSL
- V.35/X.21/RS-232 Serial
- 56/64K CSU/DSU
- High-Speed Serial Interface (HSSI)

#### Other hardware options

- SSL VPN Module
- Encryption accelerator card

#### Physical dimensions

- Length: 21 in. (53.3 cm)
- Width: 17.25 in. (43.8 cm)
- Height: 5.25 in. (13.3 cm)
- Weight: 28.0 lb (12.7 kg)

#### Operating environment

- Electrical: 100-240 VAC, 5.0A @ 100 VAC or 3.0A @ 240 VAC, 50-60 Hz
- Temperature: 32°-104°F (0°-40°C)
- Relative humidity: 10-95% non-condensing

### Nortel VPN Router 2700

Up to 2000 tunnels

#### Memory

- Standard: 256 MB
- Maximum: 512 MB

#### Processor

- 1.33 GHz Pentium III

#### Expansion slots

- Three PCI expansion slots

#### Encrypted VPN throughput

- 150 Mbps (3DES)
- 200 Mbps (AES)

#### Standard equipment

- 2 x 10/100BaseT Ethernet ports
- Management/console port (DB-9)

#### Standard software\*

##### *Secure Router Bundle:*

- Nortel VPN Router O/S with 5 VPN tunnels and IP routing

##### *VPN Bundle:*

- Nortel VPN Router O/S with 2000 VPN tunnels and IP routing

#### LAN/WAN options

- Additional 10/100BaseT Ethernet
- 1000BaseSX/T (GigE) Ethernet
- 1-port T1/E1 CSU/DSU
- 4-port T1/E1 CSU/DSU
- V.90 Dial Modem
- ISDN BRI (S/T and U interfaces)
- ADSL
- V.35/X.21/RS-232 Serial
- 56/64K CSU/DSU
- High-Speed Serial Interface (HSSI)

#### Other hardware options

- SSL VPN Module
- Encryption accelerator card

#### Physical dimensions

- Length: 21 in. (53.3 cm)
- Width: 17.25 in. (43.8 cm)
- Height: 5.25 in. (13.3 cm)
- Weight: 28.0 lb (12.7 kg)

#### Operating environment

- Electrical: 90-264 VAC, 2.0A @ 90 VAC, 47-63 Hz
- Temperature: 32°-104°F (0°-40°C)
- Relative humidity: 10-90% non-condensing

### Nortel VPN Router 5000

Up to 5000 tunnels

#### Memory

- Standard: 512 MB
- Maximum: 1.5 GB

#### Processor

- Dual 2.2 GHz Intel Xeon processors

#### Expansion slots

- Five PCI expansion slots

#### Encrypted VPN throughput

- 375 Mbps (3DES)
- 375 Mbps (AES)

#### Standard equipment

- 1 x 10/100BaseT Ethernet port
- 1 x 10/100/1000BaseT (GigE) port
- Encryption accelerator card
- Management/console port (DB-9)
- Dual, redundant, auto-switching power supply system with dual line cards
- Dual, redundant storage system

#### Standard software\*

- Nortel VPN Router O/S with 5000 VPN tunnels and IP routing

#### LAN/WAN options

- Additional 10/100BaseT Ethernet or 1000BaseSX/T (GigE) Ethernet
- 1-port T1/E1 CSU/DSU
- 4-port T1/E1 CSU/DSU
- V.90 Dial Modem
- ISDN BRI (S/T and U interfaces)
- ADSL
- V.35/X.21/RS-232 Serial
- 56/64K CSU/DSU
- High-Speed Serial Interface (HSSI)

#### Other hardware options

- SSL VPN Module
- 2nd encryption accelerator card

#### Physical dimensions

- Length: 23 in. (53.3 cm)
- Width: 17.25 in. (43.8 cm)
- Height: 5.25 in. (13.3 cm)
- Weight: 43.0 lb (19.5 kg)

#### Operating environment

- Electrical: 100-127/200-240 VAC (x2), 6.2/3.1A, 50-60 Hz
- Temperature: 32°-104°F (0°-40°C)
- Relative humidity: 10-90% non-condensing

\*Nortel VPN Client for Windows (with unlimited distribution license) included with Nortel VPN Router 1000 series and up.

## Technical specifications

### Nortel VPN Routers — Models 600, 1010, 1050, 1100, 1750, 2700 and 5000

<b>IP Routing Services</b>	<ul style="list-style-type: none"><li>• RIPv1, v2, Open Shortest Path First (OSPFv2), Border Gateway Protocol (BGP-4)</li><li>• 802.1Q VLAN routing</li><li>• Policy-based routing (next hop traffic filters)</li><li>• Virtual Router Redundancy Protocol (VRRP)</li><li>• Data Link Switching (DLSw); SNA encapsulation within IP</li><li>• Dynamic Routing over IPsec (RFC 3884)</li></ul>
<b>VPN tunneling protocols</b>	<ul style="list-style-type: none"><li>• IPsec, including authentication header (AH), encapsulating security protocol (ES) and Internet key exchange (IKE)</li><li>• Point-to-point tunneling protocol (PPTP), including compression and encryption</li><li>• Layer 2 Tunneling Protocol (L2TP), including L2TP/IPsec</li><li>• Secure Sockets Layer (SSL) v2.0, 3.0 and Transport Layer Security (TLS) with SSL VPN Module</li></ul>
<b>Encryption</b>	<ul style="list-style-type: none"><li>• Data Encryption Standard (DES)</li><li>• Triple DES (3DES) using 3 independent 56-bit keys; 168-bit key length (effective strength of 128 bits)</li><li>• Advanced Encryption Standard (AES); 128-bit and 256-bit versions</li><li>• RC4</li></ul>
<b>User authentication services</b>	<ul style="list-style-type: none"><li>• X.509 Digital Certificates and Smart Cards (support for all major vendors and MS-CAPI)</li><li>• Remote authentication dial-in user services (RADIUS)</li><li>• Hard and soft token support (e.g., SecureID and AXENT)</li><li>• User name and password and NT Domain Login</li><li>• Internal or external lightweight directory access protocol (LDAP)</li></ul>
<b>WAN protocols and services</b>	<ul style="list-style-type: none"><li>• Point-to-Point Protocol (PPP); including PPP over Ethernet (PPPoE)</li><li>• Frame Relay (including FRF.9 compression and FRF.12 fragmentation)</li><li>• ADSL (G.DMT, G.Lite, ANSI T1.413) with support for PPP and PPPoE over ATM</li><li>• Dial-on-demand and dial back-up services via integral V.90 modem or ISDN</li></ul>
<b>Bandwidth management; QoS</b>	<ul style="list-style-type: none"><li>• User and group-level configurable minimum bandwidth settings</li><li>• Eight forwarding priority queues</li><li>• DiffServ (Differentiated Services) with code point marking</li><li>• 802.1p/DSCP (Differentiated Services Code Point) mapping</li><li>• Multi-level Random Early Detection (MRED)</li><li>• Resource Reservation Protocol (RSVP)</li></ul>
<b>Data compression</b>	<ul style="list-style-type: none"><li>• IPComp (RFC 3173) for encrypted and non-encrypted traffic</li><li>• FRF.9 Frame Relay compression</li></ul>
<b>Accounting</b>	<ul style="list-style-type: none"><li>• Event, system, security and configuration logging</li><li>• Internal and external RADIUS accounting</li><li>• Automatic archiving to external system</li></ul>
<b>Management</b>	<ul style="list-style-type: none"><li>• Nortel VPN Router Multi-Element Manager provides multi-box provisioning for up to 2,500 VPN Router devices</li><li>• Full Web browser-based HTML configuration</li><li>• Nortel Command Line Interface</li><li>• Easy Install utility for simple remote VPN Router set-up</li><li>• SNMP monitoring and alerts</li><li>• Three levels of administrator access; role-based management to separate service provider and end-user</li></ul>
<b>Stateful firewall</b>	<ul style="list-style-type: none"><li>• Multi-layers stateful packet inspection supporting over 100 network application protocols, including TCP, UDP, FTP, HTTP, H.323, RealAudio, Java and ActiveX</li><li>• Defense against major “hacker” attacks, including DOS, SYN flood, Smurf, Ping, Spoofing, Fraggle and ICMP unreachable</li><li>• Extensive and customizable logging options</li><li>• NAT, Proxy and end-user authentication</li><li>• Unlimited firewall users and policies for tunneled and non-tunneled traffic</li></ul>
<b>Nortel VPN Client</b>	<ul style="list-style-type: none"><li>• IPsec (with DES, 3DES and AES encryption)</li><li>• Microsoft Windows 95, 98, 2000, ME, NT and XP-based clients (free/unlimited)</li><li>• Macintosh, IBM-AIX, SUN-Solaris, HP-UX, Linux and Windows Mobile (Pocket PC) via optional license</li></ul>
<b>Endpoint security</b>	<ul style="list-style-type: none"><li>• Tunnel Guard enforces corporate security policies on endpoint PCs by checking for anti-virus, personal firewall or any application software (e.g., patches) before allowing VPN connection</li></ul>
<b>SSL VPN</b>	<ul style="list-style-type: none"><li>• Support for up to 1000 secure Web browser sessions (with SSL VPN Module)</li><li>• Access from Microsoft Internet Explorer, Netscape Navigator and Mozilla browsers</li><li>• Universal Access Portal provides transparent IPsec or SSL single sign-on by end-users</li><li>• Authentication via RADIUS, LDAP, X.509 certificates</li><li>• Auto-logout and cache-cleaning of files and history</li></ul>
<b>Certifications</b>	<ul style="list-style-type: none"><li>• ICSA (International Computer Security Association) 1.0d certification (IPsec)</li><li>• FIPS 140-2 (Federal Information Processing Standard for Security)</li><li>• Virtual Private Network Consortium (VPNC) Basic Conformance Testing (IPsec)</li></ul>



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