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Black Box Corporation.

BLACK BOX® NETWORK SERVICES

INTEL 9545 ROUTERS

Get more out of your copper infrastructure while providing powerful, fully managed Internet connectivity.

Key Features

- ***T1 over HDSL2 with integrated ISDN/IDSL for enhanced resiliency.***
- ***Also supports PPP and Frame Relay connections over HDSL2.***
- ***Flexible and powerful architecture for easy addition of new applications.***
- ***A stateful inspection firewall means security for your e-business applications.***

Expand the capacity and customer reach of your copper infrastructure while lasering installation and support costs. The Intel Express 9545 Router is the industry's first T1 over HDSL2 access router. Featuring an HDSL2 interface with integrated CSU/DSU, an ISDN/IDSL interface, and two LAN interfaces, this router enables you to deploy twice the number of lines over your existing copper network, while offering high-speed Internet access, with unique resiliency and built-in security.

The Intel Express 9545 Router provides full T1 Internet access, while an integrated ISDN port can be configured for ISDN or IDSL as primary WAN, or as backup for a T1 line. When the ISDN port is configured for "always-on" connectivity over IDSL, the router will continuously monitor the integrity of the circuit. Create highly secure networks using the router's stateful inspection firewall, and strengthen the security even further with a second LAN for De-Militarized Zones (DMZs).

The Intel Express 9545 Router can also easily be configured as a line driver in a master/slave configuration, where it can be configured to drive both ends of the copper wire for T1-speed private networks.

Equipped with a 100-MHz i960 processor, 16 MB of flash memory, and 32 MB of RAM, the Intel Express 9545 Router has the power to support new applications without having to upgrade hardware.

Intel Device View for Windows and Web provides an intuitive configuration tool for simple and easy setup and monitoring of the Intel Express 9545 Router. A unique Embedded Operation Channel (EOC) implementation allows full remote management and configuration of the Intel Express 9545 Router, so service providers can remotely assign IP addresses, configure, and monitor all parameters on the Router.

NOTE: The Intel Express 9545 Router operates with most frame-based HDSL2 Customer Premise Equipment (CPE) and Central Office (CO) equipment that is based on Intel (Level One), GlobeSpan, or ADTRAN chipsets. For a detailed interoperability list, go to *http://support.intel.com*

Specifications

LAN Interface: (1) autosensing 10BASE-T/100BASE-TX, (1) 10BASE-T

WAN Interface: HDSL2 (RJ-45) with integrated CSU/DSU

ISDN/IDSL Interface: BRI, S/T or U

Memory: 16 MB flash, 32 MB DRAM, FlashPROM preloaded with router software (self-booting)

Console Port: DB9 male, cable included

Processor: Intel® 960JT™, 100 MHz

Compression: LZS Stac Compression chip Hi/fn 9710

Routing Protocols: IP: Static, RIP v1, RIP v2, Triggered RIP, optional OSPF; IPX: Static, RIP, SAP, IPXWAN2; Transparent Bridging and Spanning Tree Protocol; IGMP version 2; DVMRP version 3; RSVP

Software Features:

Security: Network Address Translation (NAT), Single and Dynamic IP, PPP, PAP, and CHAP authentication

Management: Intel Device View management software for Windows® or Web; Menu-based Telnet management configuration using TFTP; SNMP (MIB RFCs 1213, 1381, 1382, 1406, 1493, 1643, 1659, 2127, 2206); EOC (Embedded Operation Channel as part of ANSI T1E1.418-2000)

Cost-Control Features: AO/DI; X.25 over D-channel (X.31); PPP and D-channel Callback; PPP Multilink with BACP, spoofing, timecut, timer profiles, and activity alarms

Traffic Management: RSVP, IP Multicast, Frame Relay prioritization, Frame Relay flow control

Dial-Up Backup via Console Port: Predefined init-strings for 3Com US Robotics Courier I-modem, Courier V.Everything, Sportster; GVC 56k init-strings for other modems can be defined by the user

Filtering: Static for IP, IPX, and MAC

Stateful Inspection Firewall: Dynamic Filtering, TCP SYN Attack (denial of service) protection, TCP session control, passive and active FTP support, UDP Session Approximation, ICMP filters, logging

IDSL: PPP or Frame Relay over ISDN

Miscellaneous: Numbered and unnumbered IP/IPX links, dual firmware image for recovering factory default, ISDN log system

Physical and Link Layer:

Maximum Number of Links: Up to 60

Standards: HDLC (ISO7776), CSMA/CD (ISO 8802/3), LLC (ISO 8802/2), IEEE 802.3, ANSI T1E1.418-2000 (HDSL2)

Bridging: IEEE 802.1D, IEEE 802.1G

PPP Standards: PPP LCP (RFC 1681), PPP ML (RFC 1990), PPP Stac Compression (RFC 1974), PPP compression (RFC 1962), PPP over ISDN (RFC 1618), PPP Microsoft Call-back Control, AO/DI

Frame Relay Standards: ANSI T1.606, ANSI T1.606 Add.1, ANSI T1.617-DSS1, FRF.1, FRF.3, FRF.9, CCITT I.233.1, CCITT I.370, CCITT Q.922, Multi-protocol (RFC 1490)

X.25 Standards: ITU-T (CCITT) X.25, ISO/IEC 7776, ISO/IEC 8208, RFCs 877, 1356

CSU/DSU Standards: ANSI T1.403-1995, AT&T® TR 54016, AT&T TR 62411

ISDN Standards: S/T and U-interface; National ISDN 1, National ISDN 2, AT&T (5ESS), Nortel DMS-100, EuroISDN (ETSI), Austel TS013, Permanent ISDN, X.31 (X.25 over D-channel), AO/DI

OSPF Standards: OSPF version 2 (RFC 2328), OSPF SNMP MIB (RFC 1973), Database Overflow (RFC 1765), NSSA option (RFC 1587)

Network Layer: RFCs: 768, 783, 791, 792, 793, 826, 919, 922, 950, 951, 1027, 1055, 1058, 1155, 1166, 1212, 1213, 1256, 1315, 1332, 1493, 1552, 1631, 1638, 1700, 1717, 1723, 1812, 1994, 2091

Performance: Forwarding Rate (packets), Filtering Rate: 29,000 pps (LAN to LAN)

MTBF: Router: 273,000 hours; Power Supply: 100,000 hours

Maximum Power Consumption: 15 watts

Size: 1.6"H x 8.3"W x 9.4"D (4.1 x 21.1 x 23.9 cm)

Weight: 2.6 lb. (1.2 kg)

Technically Speaking

The Intel Express 9545 Router features an HDSL2 interface with integrated CSU/DSU. This enables the router to use a service provider's Central Office T1 provisioning over HDSL2. Where today's T1 transmission systems use four wires, HDSL2 uses two. Offering T1 over HDSL2 enables service providers to:

- Expand the customer base to offer full T1 service to customers within 12,000 feet from the Central Office.
- Double the capacity of the copper infrastructure by using a single copper pair.
- Ensure, through spectral compatibility, that service providers can offer other services and transmission technologies, ranging from ISDN over ADSL to HDSL2, without those services being interrupted.

The Intel® Express 9545 Router supports PPP (64-1.544 Mbps) and Frame Relay connections over HDSL2. In addition, the router can be configured to drive both ends of the wire for T1-speed network applications. When used as CPE device in HDSL2 networks, the Router must be connected against Frame Relay-based DSL access concentrators at the Central Office.

The Intel Express 9545 Router provides T1 over HDSL2 Internet access as well as optional backup connectivity through the integrated ISDN/IDSL interface. When configured for backup over IDSL, the router enables automatic monitoring of line integrity, thereby adding an extra level of resiliency to the network availability. The integrated stateful inspection firewall allows easy creation of highly secure networks, and security can be strengthened even further by the use of the second LAN port for De-Militarized Zones.

With Intel Express 9545 Routers and advanced EOC (Embedded Operation Channel) support, it is possible to enter the CPE device remotely from the Central Office to configure it over a 4-kbps EOC channel. The only requirement is that the HDSL2 connection be up on the HDSL2 layer, no IP; also, Frame Relay is needed to use the EOC.

The router can be accessed remotely through an EOC channel, allowing full configuration of all available parameters, as well as full monitoring and statistics.

The Intel Express 9545 Router contains a 100-MHz RISC processor, 16 MB of flash memory, and 32 MB of RAM, enabling it to support feature enhancements and firmware upgrades. By incorporating extra horsepower into the design, this router is able to support new applications without hardware upgrades while maintaining overall performance quality.

Ordering Information

ITEM	CODE
Intel 9545 Routers	
with U Interface	ER9545UUS
with S/T Interface	ER9545STUS