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Software Product Description

PRODUCT NAME: RouteAbout Access ISDN Software, Version 3.0   SPD 56.55.01

Description

The RouteAbout Access ISDN Software, Version 3.0, provides TCP/IP as well as multiprotocol bridge-routing capability. It is available in two versions:

- RouteAbout Access ISDN/IP: a TCP/IP-only Basic Rate ISDN router with wide area support, compression capability for bandwidth optimization, and security features. The RouteAbout Access ISDN TCP /IP hardware contains 2 MB of dynamic random access memory (DRAM) and 1 MB of Flash memory that cannot be expanded. The U.S. version of this router comes with an integrated Network Termination (NT1) device.

- RouteAbout Access ISDN/MP: a Multiprotocol Basic Rate ISDN bridge-router that supports Bridging, TCP/IP, IPX, and AppleTalk. It has wide area support features, compression capability for bandwidth optimization, and security features.

The RouteAbout Access ISDN Multiprotocol hardware contains 4 MB of DRAM and 2 MB of Flash memory that cannot be expanded. The U.S. version of this router comes with an integrated NT1 device.

TCP/IP Routing

TCP/IP Routing is supported in both the RouteAbout Access ISDN IP and MP. The IP implementation routes data in accordance with TCP/IP standards. Routing table entries can be static, in which case the user configures them from the console, or they can be dynamically created by routing protocols.

Routing Information Protocol Version 2

Support for Routing Information Protocol (RIP) Version 2 functionality as specified in RFC 1723 and RFC 1724 is included. RIP Version 2 addresses the shortcomings of Version 1, yet maintains the simplicity of RIP. An important feature is the ability to carry subnet mask information along with the destination IP address. This is used to distinguish between subnet and host routes. This also allows the usage of variable length subnet masks in the RIP domain and supports route aggregation. This implementation supports simple password authentication and is compatible with RIP Version 1 networks.

Triggered RIP

Triggered RIP proposes modification to distance-vector based routing protocols, such as RIP, to cut down on the bandwidth these protocols require through their frequent broadcasting of routing information.

Since RIP broadcasts routing tables every few seconds, it can consume a lot of bandwidth and interfere with the normal flow of traffic. It is particularly hard on dialed circuits because it can force a situation whereby the link is almost always up due to the dialing on demand of the routers to exchange routing information. Triggered RIP overcomes this situation by limiting the exchange of incremental routing updates upon the occurrence of any change in the routing information. For instance, RIP normally broadcasts "I have routes A, B, and C at my disposal" every few seconds. With Triggered RIP, the router initially hears from its neighbors "I have routes A, B, and C at my disposal" and then nothing else until something changes. If router 3 goes down or the line disconnects for some reason, router 2 then sends an update (and only then) to router 1 saying "I now have routes B and C at my disposal."

Subnetting

Subnetting is supported in both the RouteAbout Access ISDN IP and MP. Subnetting support is fully compliant with RFC 950. Any number of IP networks can be subnetted. When the RIP is used, subnet masks are specified on a per-network basis. In this case, a given IP network may have only one subnet mask.

TCP/IP Access Control

TCP/IP Access Control is supported in both the RouteAbout Access ISDN IP and MP. Access control lists can be applied separately to each interface for either incoming or outgoing traffic. Packets can be filtered based on the source or destination address, IP protocol number, or TCP/UDP port number.

Network Address Translation

NAT support is compliant with RFC 1631, which allows multiple computers on your LAN to share a type of Internet connection that is otherwise limited to a single computer. It hides the addresses of all computers on your LAN from the Internet. All data from your LAN appears to come from the address of your WAN interface.

Based upon the concept of address reuse by private networks, it operates by mapping the local IP addresses of the edge devices to the globally unique ones required for communication with hosts on other networks. You can user your existing private IP network address scheme or preferably the scheme recommended in RFC 1918. The router acts as a remapper, exchanging the Local Domain IP addresses from the external Domain (for example, the Internet service provider).

Fragmentation

As referenced in RFC 791, if the destination network does not support packets as large as those to be sent, the router fragments the packets before transmission.

TCP/IP Static Filters

TCP/IP Static Filters are supported in both the RouteAbout Access ISDN IP and MP. IP filters start by blocking all traffic. You then create a profile or collection of filters, to allow traffic based on your organization's security policy. You can allow access to specific internal network resources, and you can allow internal clients to access services outside your corporate network. Once you set up your filters, you can test and troubleshoot them by using Event Logging System (ELS) messages.

Supported TCP/IP Standards

RFC	Description
RFC 768	User Datagram Protocol
RFC 791	Internet Protocol
RFC 792	Internet Control Message Protocol

RFC	Description
RFC 793	Transmission Control Protocol
RFC 826	IP Datagrams Over Public Data Networks
RFC 854	Telnet
RFC 894	Transmission of IP Datagrams Over Ethernet
RFC 925	Multi-LAN Address Resolution
RFC 950	Internet Standard Subnetting Procedure
RFC 951	BOOTP
RFC 1157	SNMP
RFC 1332	IPCP Internet Protocol Control Protocol
RFC 1334	PAP/CHAP
RFC 1350	TFTP
RFC 1570	LCP Extension (partial magic number only)
RFC 1661	PPP Data Link for TCP/IP
RFC 1723	RIP V2
RFC 1724	RIP V2

Dynamic IP Address Assignment

Both the RouteAbout Access ISDN IP and MP support the Dynamic IP Address Assignment feature. This feature allows IP addresses to be assigned to the router's WAN port. Dynamic IP Address Assignment operates with Point-to-Point Protocol (PPP) circuits, using the IPCP send IP address facility.

IP Antispoofing

IP Antispoofing is supported in both the RouteAbout Access ISDN IP and MP. This feature provides a mechanism to stop unauthorized remote users from masquerading as authorized users. Hackers may attempt to break into a network by "spoofing" (using a forged IP source address to circumvent a firewall). The packet appears to have come from inside the protected network, and therefore can be eligible for forwarding through the network. With the antispoofing feature, the router identifies the remote user as a user coming in over the WAN serial port—one that cannot have the same IP address as the internal LAN. Having identified the act of intrusion, the router does not allow the packet through.

Secure Password

Secure Password is supported in both the RouteAbout Access ISDN IP and MP. From an administrative standpoint, this feature protects the router by enabling the router to ask for a password at login.

Multilink PPP

Multilink PPP is supported in both the RouteAbout Access ISDN IP and MP. This feature supports the aggregation of B channels to create greater bandwidth capacity as defined in RFC 1717. Multilink PPP or Split B channel supports the use of two separate lines or aggregated as one via Multilink PPP.

PAP and CHAP Support

The authenticator and peer negotiate an authentication protocol during the link establishment phase of PPP. To do so, the authenticator requests the peer to use either the Password Authentication Protocol (PAP) or the Challenge Handshake Authentication Protocol (CHAP). If the peer replies that it can support that protocol, the two systems perform the authentication process.

Both the RouteAbout Access ISDN IP and MP support PAP. The router initiates the authentication process by sending a PAP request packet. PAP uses a two-way handshake and does not encrypt the password that identifies the peer to the authenticator. This implementation complies with RFC 1334, PPP Authentication Protocols.

Both the RouteAbout Access ISDN IP and MP support CHAP. CHAP uses a three-way handshake to verify the identity of the peer. CHAP uses the RSA Data Security, Inc., MD5 Message-Digest Algorithm, copyright 1990. This implementation complies with RFC 1334, PPP Authentication Protocols.

Callback Support with PPP

The Callback feature is supported in both the RouteAbout Access ISDN IP and MP. When enabled, this feature causes the RouteAbout Access ISDN to make or accept callback requests to and from the remote router. The RouteAbout Access ISDN uses the LCP Callback option defined in RFC 1570 to control callback processing; it must be supported by the remote router to the degree necessary to successfully execute in the mode specified. PPP authentication is then used to determine the identity of the calling router.

D Channel Callback

D-channel callback enables a local router to use an incoming call as a signal to call back to a remote router. The router receiving the call does NOT answer the inbound call, but is instead triggered to place a callback to the designated site, thus preventing the original caller from incurring ISDN charges. Working in conjunction with Caller-ID (where available), the router will correctly ignore calls from unknown parties and correctly call back the appropriate remote router.

PPP Data Link

The RouteAbout Access ISDN IP and MP support PPP Data Link for the following protocols: IP, IPX (IPXWAN), and AppleTalk.

Compression

STAC LZS5, Version 5.0, technology is supported in both the RouteAbout Access ISDN IP and MP. STAC LZS, Version 5.0, provides compression on PPP data links over ISDN lines.

Data Over Speech Bearer Service

Data Over Speech Bearer Service (DOSBS) enables the router to accept and place voice calls over ISDN and treat them as data calls.

ISDN Leased Line

In some parts of the world, Telephone Companies standardized on ISDN switches at the Central Offices. Thus, even leased lines run through ISDN switches. This feature allows you to have a permanent ISDN circuit. Support is currently provided for INS64 switches only.

Bandwidth Reservation

Bandwidth Reservation is supported in the RouteAbout Access ISDN/MP. Bandwidth Reservation guarantees outgoing bandwidth on ISDN lines only. This system reserves percentages of the total bandwidth for specified classes of traffic. These percentages are a guaranteed minimum for the class when the line is fully loaded. A class can exceed its guaranteed minimum on a line with light traffic, using up to 100 percent of the line bandwidth. The system dynamically adapts to changes in line speed, applying the same percentage to the new line speed.

IPX Routing

Novell NetWare Routing is supported in the RouteAbout Access ISDN/MP. The IPX implementation routes NetWare traffic in accordance with the Novell specification for the IPX protocols.

IPX support includes full implementation of the NetWare Routing Information Protocol (RIP) and Service Advertising Protocol (SAP). The router keeps multiple equal cost routes to a given remote IPX network, but selects a primary route that is used exclusively when the route is available.

IPX Static Routes

The RouteAbout Access ISDN/MP supports IPX Static Routes. IPX Static Routes minimize IPX routing traffic over the ISDN WAN dial-on-demand connection by using IPX static routing as the routing protocol chosen for the IPX WAN connection for very simple network connections. This means that no IPX routing information of any kind is sent over the WAN link. Therefore, the IPX network routes and the SAPs must be statically configured.

IPX WAN

The RouteAbout Access ISDN/MP supports IPX WAN. IPX WAN is a point-to-point concept. It is the Novell standard way of running the Novell IPX protocol over various WAN media. DIGITAL supports IPX WAN Version 2 over PPP, X.25, and IP Relay.

Supported IPX Standards

RFC and Date	Description
RFC 1362 September 1992	Novell IPX Over Various WAN Media, Novell, Inc.
RFC 1634 May 1994	Novell IPX Over Various WAN Media, Novell, Inc.

AppleTalk Routing

AppleTalk Phase 2 Routing is supported in the RouteAbout Access ISDN/MP. The router maintains its AppleTalk routing table by using the Route Table Maintenance Protocol (RTMP). The Phase 2 implementation of RTMP has two extensions:

- A notify neighbor technique, which propagates bad entries faster

- A split horizon technique, which reduces the size of the RTMP route update

Zone Information Protocol

The router maintains a Zone Information Table (ZIT) through the use of the Zone Information Protocol (ZIP). The ZIT consists of zone information associated with each network in the routing table. Phase 2 AppleTalk extends ZIP to allow zone lists for each network range along with a default zone name.

Network Zone Filters

The AppleTalk Phase 2 implementation supports network and zone name filters for each interface. There are separate filter lists for incoming and outgoing information. The router does not advertise filtered zone information in the specified directions. Both inclusive (allowed zone) and exclusive (blocked zone) lists are supported.

AppleTalk Address Resolution Protocol

The AppleTalk Address Resolution Protocol (AARP) is supported in the RouteAbout Access ISDN/MP.

Supported AppleTalk Standards

RFC	Description
RFC 1243 May 1990	AppleTalk Management Information Base Apple Computer, Inc., Inside AppleTalk (Phase 2), Second Edition, Addison Wesley

Event Logging System

Event logging is supported in both the RouteAbout Access ISDN IP and MP. The Event Logging System (ELS) is a monitoring system that manages messages generated by system components within the router. Messages are caused by system activity, status changes, service requests, data transmission and reception, and data and internal errors. User configuration determines the types of messages to be collected. The messages can be displayed on the console terminal screen or accessed through SNMP.

Interface Utilization Measurement

Interface Utilization Measurement provides for the monitoring and configuration of interface activity. You can configure a utilization level (expressed as a percentage) for interfaces and generate ELS messages and/or SNMP traps to notify operators of the interface utilization level.

ISDN Interface

Both the RouteAbout Access ISDN IP and MP have a single ISDN Basic Rate Interface. The ISDN Basic Rate Interface provides two 64-KB/s B channels for data and a 16-KB/s D channel for signaling.

INSTALLATION

The RouteAbout Access ISDN IP and MP software is factory installed in the Flash memory of the router. Software upgrades are performed with the TFTP protocol either locally or remotely over any supported interface.

For reloads when there is no valid software image in the Flash memory of the router, loading is supported by BOOTP/TFTP code in the router's programmable read-only memory (PROM). The load host can be either local or remote.

CONFIGURATION AND MANAGEMENT

The RouteAbout Access ISDN IP and MP can be configured by using the RouteAbout Access Configuration Tool, which is a Microsoft Windows based graphical configurator shipped with the RouteAbout ISDN. The tool runs under Windows NT Version 4.0 and Windows 95. The RouteAbout Access Configuration Tool allows for fast configuration of the router interface and protocols.

SOFTWARE PRODUCT SERVICES

A variety of service options are available from DIGITAL. For more information, contact your local DIGITAL office.

SOFTWARE LICENSING

A separate license is required for each Router hardware unit on which the software product is to be used. This license is included in the price of the Router hardware. A license letter is shipped with the hardware unit along with the invoice; both of these serve as proof of license.

The licensing provisions of the DIGITAL Standard Terms and Conditions specify that the software and any part thereof (but excluding those parts specific to the load hosts) may be used only on the single Router hardware unit on which the software is operated, but may be copied in whole or in part (with proper inclusion of the DIGITAL copyright notice and any proprietary notices on the software) between multiple load hosts on the same LAN.

This software is furnished under the licensing provisions of the DIGITAL Standard Terms and Conditions. For more information about DIGITAL licensing terms and policies, contact your local DIGITAL office.

HARDWARE

The RouteAbout Access ISDN Version 3.0 Software requires the following hardware: a RouteAbout Access ISDN module and a console terminal for local configuration of the router.

Country	RouteAbout Access ISDN/IP	RouteAbout Access ISDN/MP
U.S. and Canada	DEX1C-FA	DEX1B-DA
Europe and Asia Pacific	DEX1E-F*[1]	DEX1D-D*[1]

1.The asterisk (*) denotes the country kit variant.