



The Virtual Access Next Generation ISDN NT1 family of products enables the service provider to deliver Basic Rate ISDN (BRI) services over next generation IP/Ethernet infrastructures.

As part of an overall NG Architecture, the NG-NT1 presents an ISDN BRI S/T interface identical to the interface that is currently provided by existing ISDN NT1s. Customer equipment plugs into this S/T interface on the NG-NT1 and the service is used in the same way as the existing BRI services.

Next Generation ISDN NT1

The Virtual Access NG-NT1 enables the delivery of all the ISDN services including B-channel voice and data circuit switched calls, and D-channel packet switched services.

The NG-NT1 provides a very flexible approach, enabling several methods of providing an NG ISDN service. Signalling flexibility includes the use of HDLC pseudowires or IUA for communication with the softswitch, while the B-channel data can be carried using either Circuit Emulation Services over IP (CESoIP), Voice over IP, or HDLC pseudowires.

ISDN D-channel Signalling

The ISDN D-channel can be handled in two ways:

ISDN Q.921 User Adaptation Layer

The NG-NT1 can process D-channel traffic in accordance with RFC3057, ISDN Q.921 User Adaptation Layer (IUA). Using this method, LAPD (Q.921) is terminated on the NG-NT1 and the payload, typically Q.931, is transferred to and from a softswitch using SCTP over IP.

HDLC Pseudowire

This method is used to transport all the D-channel frames to a remote signalling gateway, in accordance with RFC4618. Using this approach, LAPD is terminated on the remote signalling gateway.

D-channel X.25 Handling

The NG-NT1 can support D-channel X.25 services in one of three ways:

ISDN Q.921 User Adaptation Layer

IUA can transport X.25 SAPI-16 frames to a signalling gateway. The SAPI-16 frames can be sent to a different gateway from the SAPI-0 Q.931 frames, enabling the voice and data networks to be built separately.

HDLC Pseudowire

An HDLC pseudowire can transport all D-channel frames to a signalling gateway, including both SAPI-0 Q.931 frames and SAPI-16 X.25 frames. It is the responsibility of the signalling gateway to separate and process the different traffic types appropriately.

X.25 over TCP

The NG-NT1 also supports X.25 over TCP according to RFC1613. The Virtual Access X.25 Migration protocol is also supported, providing compatibility with the Virtual Access Always-On Server X.25 packet switching system.

ISDN B-channel Handling

CESoIP

The NG-NT1 supports CEoIP techniques for transporting B-channel data. This technique provides very fast data forwarding at up to 1000 packets per second. Using this technique, together with a high performance network, enables transfer of data with very low latency and so avoids the need for echo cancellation.

VoIP Processing

In instances where compatibility with remote VoIP Media Gateways is required, VoIP processing of the B-channel data stream is supported. A large number of codecs is supported, together with echo cancellation.

HDLC Pseudowire

The NG-NT1 also supports the transport of B-channel data using HDLC pseudowires (RFC4618) where the data is known to be HDLC frame-based.

Adaptive Clock Recovery

The NG-NT1 implements a digital phase locked loop for recovery of the ISDN S-Bus clock from the incoming data stream. This maintains clock synchronisation across the ISDN domain with Fractional Frequency Offset (FFOFF) of 1-ppm for network jitter less than 10msec.

10/100 Mbps Ethernet Interface

The Ethernet interface supports 10Mbps and 100Mbps speeds. The interface supports automatic or manual selection of speed and duplex, and automatic crossover cable detection.

AutoLAN features, including DHCP client and server, DNS proxy and advanced network address translation ensure minimal set up is required within the LAN environment.

IPSec Support

The NG-NT1 supports IPSec Virtual Private Networking, providing security of customer data over the IP network. The high performance encryption processor is capable of up to 44Mbps of 3DES IPSec throughput.

Service Provisioning

Zero Touch provisioning, enabled with the Activator Service Controller, provides true plug and play network provisioning. The user or installation engineer simply connects the device to the access line and a power outlet. The NG-NT1 contacts Activator Service Controller, which delivers the required software image and configuration.

In addition to multiple software version support, the NG-NT1 stores multiple configurations, enabling an additional layer of automatic roll-back and service recovery capabilities.

Virtual Access provides a "Fast Start" installation wizard. Entirely web-based, and running on the NG-NT1, the wizard can be launched from any standard web browser with no need to install software on the PC, reducing installation complexity and risk.

The NG-NT1 provides a separate expert view area of the embedded web for complete access to all configuration parameters. Multi-level password protection ensures that network administrators can be given a level of access appropriate to their roles and requirements.

Software Features

Service Management

- Zero Touch configuration and provisioning
- Zero Touch IPsec VPN implementation and configuration
- Zero Touch software and configuration upgrade
- Safe auto roll-back and multiple configuration support
- Web-based management access
- Ease of diagnostics

ISDN Q.921 User Adaptation Layer (UA) RFC3057

- Terminates LAPD (Q.921) on the NG-NT1
- Transport LAPD payload to softswitch using SCTP
- SCTP over UDP tunnelling option for firewall compatibility

HDLC Pseudowire RFC4618

- Transports D-channel or B-channel frames to remote gateway

MGCP Signalling RFC3435

- Used to control B-channel connections to remote media gateways

IP Service Features

- Configurable host traffic monitoring applet
- DHCP server
- DHCP relay
- DNS proxy
- BOOTP client
- Network address translation
- Packet filtering and firewalling
- ProActive pre-processed statistics gathering through the Performance Monitor applet

Management

- Local and remote advanced configuration through embedded web server and Java applets
- Embedded web interface
- Fast.Start wizard for ease of configuration
- TFTP client download/upload
- Activator smart file server compatible
- Telnet server

Event Handling

- Fully configurable event discriminators
- Up to 4 SNMP managers for trap handling
- Non-volatile event logging
- Syslog support
- Email event alerting

Fault Investigation and Reporting

- Non-volatile configuration change log
- Full web-based protocol level trace and debug
- Trace route
- Ping

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IPsec Virtual Private Networking

- Provides data privacy over the IP network
- Manual and automatic key management
- HMAC-MD5-96 and HMAC-SHA-1-96 for authentication
- 3DES(168 bit) and DES(56 bit) with explicit IV for encryption
- Up to 44Mbps of 3DES/HMAC-MD5-96 throughput
- Main, aggressive, and quick modes

Quality of Service

- Support of Diffserv classification, marking services and prioritisation

Routing Features

- Support for IP, TCP, UDP, ICMP
- Static and dynamic IP routing algorithms
- PPPoE
- PAP/CHAP security
- RIP and RIP2
- Generic Routing Encapsulation
- Network time protocol
- X.25 over TCP/IP (XOT RFC1613)
- SNMP MIB II

Hardware Features

WAN Ethernet Features

- 10/100Base-T Ethernet port
- Link status and data indicator LEDs
- Auto detects full- or half-duplex operation
- MDIX auto-detects regular or crossover cable for easy connection to a switch or hub

ISDN NT Interface

- ISDN basic rate NT mode S/T-interface presented on dual RJ45 sockets
- Switchable 100 ohm termination resistors
- Conforms to ITU-T recommendation I.420

Phantom Power

- ISDN Phantom Power 40VDC option

High Performance DSP Voice Processor

Voice codecs supported:

- G.711 A-law or μ -law at 64kbps
- G.729 AB CS-ACELP at 8kbps
- G.723.1 MP-MLQ at 6.3kbps, ACELP at 5.3kbps
- G.727 E-ADPCM at 16-40kbps
- G.726 ADPCM at 16-40kbps
- GSM 6.10 FR at 13kbps
- Transparent codec at 64kbps

Fax support:

- G3 2.4-14.4kbps, T.38 compliant fax relay

Echo canceller:

- G.168-2002 compliant, 25msec tail length

Circuit Emulation over IP

- Complies with RFC4553
- Data forwarding timer adjustable down to 1ms (1000 pps)

Clock Recovery Digital Phase Locked Loop

- Recovers ISDN S-bus clock from RTP
- Supports FFOFF of 1-ppm between the source and the recovered clock at the remote end-point for jitter <10msec

Power

- 100V-240V AC
- Power adapter to 12V DC 1A
- 3.5 Watts

Operating Temperature

- 0°C to 40°C

Physical Characteristics

- Size: W200mm X D135mm X H30mm
- Weight: 540g



Base Model GW47XX				
Features	WAN Ethernet	VoIP Processor	ISDN NT Interfaces (sockets)	ISDN Phantom Power
Models				
GW4767	▲		1(2)	
GW4768	▲		1(2)	▲
GW4769	▲	▲	1(2)	
GW4770	▲	▲	1(2)	▲