

MAX TNT® Universal Gateway



The MAX TNT® Universal Gateway is today's most widely deployed IP dial access and VoIP platform. This carrier-grade access solution supports any service on any port at any time. It enhances your revenue opportunities with port wholesaling for dial-up IP with Internet call diversion (ICD) and VPNs, diverse VoIP applications and other high-return voice and data services.

Applications

Supports IP-based access services such as:

- Dial IP access services
- Port wholesaling
- VoIP
- Wireline and wireless

Features

- Universal port technology for “any service, any port, any time” versatility
- Consolidates channelized T1/E1, channelized DS3, ISDN PRI, leased T1/E1 or fractional T1/E1 Frame Relay and channelized T1/E1 Frame Relay over high-speed digital trunks
- Signaling and trunking options include PCTFI integration with Lucent 5ESS® Switch
- Redundant power supplies, port processing resources, egress interfaces; all modules hot-swappable
- SS7-based ICD
- Multi-protocol support including H.323, IPDC, V.92 (with V.90)
- Lucent Voice.Natural technology from Bell Labs for enhanced VoIP call quality
- Feature-rich True Access® Operating System (TAOS) — over 35 million ports installed worldwide

Benefits

- **Increased ROI** — aggregate dial modem and leased line (e.g., Frame Relay) users on a single access platform
- **Flexibility** — optimize transport for diverse locations, traffic volumes and applications; deploy your choice of ingress (T1/E1 to DS3) and egress (Fast Ethernet, DS3/OC-3) modules; turn on revenue-generating IP services whenever and wherever you want them
- **High availability and reliability** — maximize uptime and serviceability with redundant components and carrier-proven TAOS
- **Reduced capital expenditures** — deliver port wholesaling, VoIP, dial-up IP access and voice services from the same platform; no need for separate modem banks, terminal servers, routers, access lines
- **Reduced operating expenditures** — simplify network management with Lucent NavisAccess™ management system; save CO space; minimize training and maintenance with mature TAOS
- **Investment protection** — capitalize on emerging applications via universal port capability and wide range of protocols
- **Cost-effective growth** — migrate easily to higher-capacity Universal Gateway platforms; add services as needed through software upgrades



Technical Specifications

1. Protocols Supported

WAN/LAN

- TCP/IP, UDP/IP, TCP Clear, DHCP, PPP, SLIP, CSLIP, Sync/Async-PPP, HDLC, Frame Relay
- T1: PRI, RBS: Loop-Start, Wink-Start, R1, MF FG-D
- E1: PRI, E1 R2 MF (country-specific call progress tones)

Routing

- RIP, RIP2, OSPF, BGP4

VPN/tunneling

- L2TP, ATMP, GRE, IP in IP*, L2F, PPTP, Virtual Routers

SS7 call control and signaling

- IPDC, E1/T1 tunneling using IPDC

Non-SS7 call control and signaling

- H.323v2

Fax-over-IP/Modem-over-IP

- Group III Fax, T.38, Transparent Fax, Transparent Modem

Modem termination

- V.92: Modem on Hold, QuickConnect, PCM Up-stream*
- V.90, K56Flex, V.34bis, V.34, V.32bis, V.32, V.22bis, V.22A/B, V.23, V.21, Bell 103, V.44, V.42, V.42bis, PIAFS (PHS)

Data Compression over PPP

- STAC, STAC-9, MS-STAC, and MPPC

ATM

- UNI 3.1, PVC (CBR, VBR)

ISDN

- AT&T, Northern Telecom, Q.931 GloBand, Japan-PRI, VN3-PRI, OneTR6-PRI, Net5-PRI, Danish-PRI, Australia-PRI, National ISDN 2, NFAS with D channel back-up, network and user-side ISDN

2. Bandwidth Management

MLPPP, MP/MP+, BACP, TCP header compression, packet fragmentation, ATM traffic shaping

3. QoS

RFC 2474 - Differentiated Services Code Point (DSCP) support
RFC 791/1349 Type of Service (ToS) support
VoIP call statistic reporting
Lucent Voice.Natural

4. Security and Authentication

RADIUS, TACACS/TACACS+, PAP, CHAP, MS CHAP v1, DNIS, CLID, callback, token, local password, call-type pre-authentication, SSH1 for Telnet

5. Management

SNMPv2, NavisAccess™ system, Telnet, console, COT testing

6. Serviceability

All line interface and processing modules hot swappable and field replaceable

7. Density

672 DS0s – via Channelized DS3 (tested maximum recommended universal port density)

864 DS0s – via Channelized DS3 and T1

960 DS0s – via Channelized E1

8. Operating System

True Access™ Operating System (TAOS) embedded software technology for edge access platforms including Lucent MAX™ and APX™ Universal Gateway, Multiband IMUX and Pipeline SOHO router product families; combines multi-platform support with hardware-specific capabilities

9. Chassis Architecture

Installed shelf control module plus 16 slots for access switching modules (packet and circuit) and processing modules (MultiDSP cards, HDLC cards, etc.)

10. Voice over IP Support – with Lucent Voice.Natural

CODECs Supported: G.711 a-law & μ-law, G.728, G.729a, G.729 a+b, G.723.1

DTMF support: in-band, RFC 2833, via H.245 (H.323)

Tone generation and detection

Announcement storage and generation

Echo cancellation: G.168-2000 (G.165) – up to 64 ms echo tail

Voice activity detection, comfort noise generation, silence suppression

Dynamic/static jitter buffer

Frame loss concealment/frame repeat

Bell Labs – Speech Normalization (inverse IRS filtering)

Packet fragmentation for greater QoS with

VoIP client applications



11. Physical Dimensions

11.5" depth x 17.4" width x 14" height (8 rack units)
Loaded system weight: 130 lbs. (approximate)

12. Power Requirements

AC or DC power supply units – up to 2 per chassis (redundant, load sharing)

Power budget AC:

Total typical values per fully loaded (960-port) chassis:

- Input power per chassis: 620.3 W
- Heat dissipation: 2117 BTU/h
- Current intake @ 100Vac input: 6.2 A
- Current intake @ 115Vac input: 5.4 A
- Current intake @ 230Vac input: 2.7 A

Recommendations:

- Input power budget per chassis: 744.4 W
- Heat dissipation budget: 2540 BTU/h
- Current intake budget @ 100Vac input: 7.4 A
- Current intake budget @ 115Vac input: 6.5 A
- Current intake budget @ 230Vac input: 3.2 A

Power budget DC:

Total typical values per fully loaded (960-port) chassis:

- Input power per chassis: 602.6 W
- Heat dissipation: 2056 BTU/h
- Current intake @ -48Vdc input: 12.6 A
- Current intake @ -40Vdc input: 15.1 A

Recommendations:

- Input power budget per chassis: 723.1 W
- Heat dissipation budget: 2467 BTU/h
- Current intake budget @ -48Vdc input: 15.1 A
- Current intake budget @ -40Vdc input: 18.1 A

13. Operating Characteristics

Ambient operating temperature: 0 to 40 C (32 – 104 F)
Relative humidity: 0% to 90% non-condensing
Operating altitude: 0 to 14,800 feet (0 – 4,500 M)

14. MAX TNT® Module Options

WAN Access Modules

- Circuit switching (ingress)
- 8-port T1 with integrated CSU/DSU
- 8-port E1
- 1-port Channelized DS3
- 1-port PCTFI – for direct integration with Lucent 5ESS® Switch
- Packet switching (egress)
- 10-port T1 Frame Relay
- 10-port E1 Frame Relay
- 1-port E3 ATM
- 1-port DS3 ATM
- 1-port OC3/STM-1 ATM (copper or short-haul fiber or long-haul fiber)
- 4-port serial WAN

LAN/WAN Access Modules

- Packet switching (egress)
- 2- and 4-port 10/100 Fast Ethernet

Processor Modules/CODEC Support

- 96-port MultiDSP/G.711, G.729a, G.729a+b
- 48-port MultiDSP/G.711, G.728, G.729a, G.729a+b, G.723.1
- 2nd-generation HDLC module

15. Regulatory Compliance

NEBS

- Level 3 compliant, GR-63-CORE, GR-1089-CORE, CLEI coded

EMC/EMI

- FCC 15 Class A, R&TTE Directive (EN 55022, EN 300 386), Class A, EN 61000-3-2, EN 61000-3-3, AS/NZS 3548, Class A, CISPR 22 Class A, VCCI Class A, CNS 13438 Class A

Safety

- CSA NRTL (UL 1950, Third Edition), CSA C22.2, No. 950, Third Edition, R&TTE Directive EN 60950 including Amendments 1, 2, 3, 4, 11, IEC 60950 including Amendments 1, 2, 3, 4

Telecom

- FCC Part 68, IC CS 03, JATE

* Requires TAOS 10.1 or later

To learn more about our comprehensive portfolio, please contact your Lucent Technologies Sales Representative or Lucent Business Partner, or visit our web site at www.lucent.com.

This document is provided for planning purposes only, and does not create, modify or supplement any warranties which may be made by Lucent Technologies relating to the products and/or services described herein. The publication of information contained in this document does not imply freedom from patent or other protective rights of Lucent Technologies or third parties.

True Access, 5ESS and MAX TNT are registered trademarks, and APX, MAX and NavisAccess are trademarks, of Lucent Technologies Inc.

Copyright © 2003
Lucent Technologies Inc.
All rights reserved

MAX TNT v1.0103

Lucent Technologies
Bell Labs Innovations

