NETRIX

Nx2222

VOIP Gateway with Bandwidth Optimization

- *Up to 18 T1/E1 Circuits of TDM to IP traffic **

- *Up to 548 PSTN Voice, Facsimile or Data Modem circuits*

- *Reduced "chatter" Mode Optimized for Satellites*

- *SIP Gateway with packet shaping*

- *Advanced Quality of Service Mechanisms*

- *Expandable Modular Design*

- *Standards Compliance ensures Superior Interoperability*

The Nx2222 is the latest in a line of Netrix high performance voice and data compression routers designed as a VoIP (SIP) gateway for aggregating and optimizing conventional Leased Line, Wireless and Satellite voice, fax and data traffic. As a fully featured Telecom switching platform, the Nx2222 reduces network costs for operators by freeing capacity, making it available to increase revenue on existing services and enabling the introduction of new services.

Based on field proven technology, the Nx2222 takes advantage of the latest generation hardware and advanced software to provide a highly integrated and scalable design. From 2 to 18 T1/E1 circuits of TDM voice or data traffic, or up to 548 PSTN voice, facsimile or fractional data channels can be accommodated in a single 1U high chassis.

With hot swappable line cards, redundancy and remote management support, the Nx2222 is designed for interfacing traditional voice traffic to IP based services, either as a SIP gateway or by providing a 'transparent' TDM over IP connection. The modular design of the Nx2222 allows it to easily scale to higher capacity networks.

The Nx2222 contains a DS0 digital cross connect, an IP router with gateway functions, Ethernet ports and high speed serial ports supported by the broad and extensively deployed Netrix suite of protocol optimization, switching and voice compression algorithms. Netrix voice compression supports standard VoIP with SIP as well as alternative low-rate, toll-quality compression used by the US military to achieve up to 16:1 bandwidth compression. Even previously compressed G.729 VoIP traffic can be aggregated using Netrix packet optimization software, to provide additional bandwidth gains of up to 3:1 with no loss of voice quality.

The Nx2222 is remotely configurable using the Netrixview GUI management system and is packed with advanced features such as T1/E1 failure detection with Automatic Fail-over to an IP backup link, transparent TDM operation over IP with embedded clock recovery, and IP packet shaping. In satellite applications the Nx2222 supports both IP and serial connections for seamless use in SCPC and DAMA systems.

NSG has partnered with major satellite vendors to optimize bandwidth usage. Currently installed in many countries, Nx2200 series products have provided reliable communications for critical US Carrier and Military voice and data services for over 15 years. Other widely deployed applications include call center, banking, transaction processing, air traffic control and service providers world-wide.
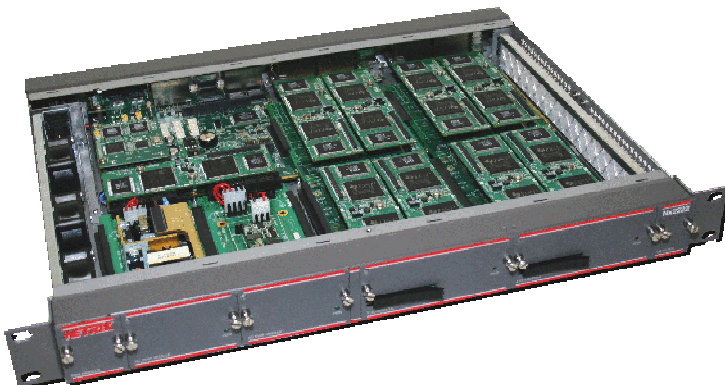
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Satellite Optimization

The Nx2222 is an integrated digital cross connect and compression gateway for voice applications. Up to 18 full or fractional T1 or E1 voice/data circuits can be connected directly to the unit and individual DS0s compressed and merged for transmission over TDM, Frame or IP packet-based connections. Unused voice channels can be dynamically compressed to save bandwidth on terrestrial or satellite connections. Synchronizing "chatter" between units can be eliminated using a new mode of operation developed for use over bandwidth sensitive satellite links.

TDM clock recovery allows TDM circuits to be merged and/or transparently transmitted over IP satellite, wireless, or terrestrial links. This includes standards compliant clock regeneration and jitter buffering to synchronize remote locations to the central network.

The Nx2222 operates seamlessly with the Nx2205D backhaul optimization and access router. Any connection into the Nx2222 can be configured as a network trunk or access port.

Satellite or Wireless Disaster Recovery
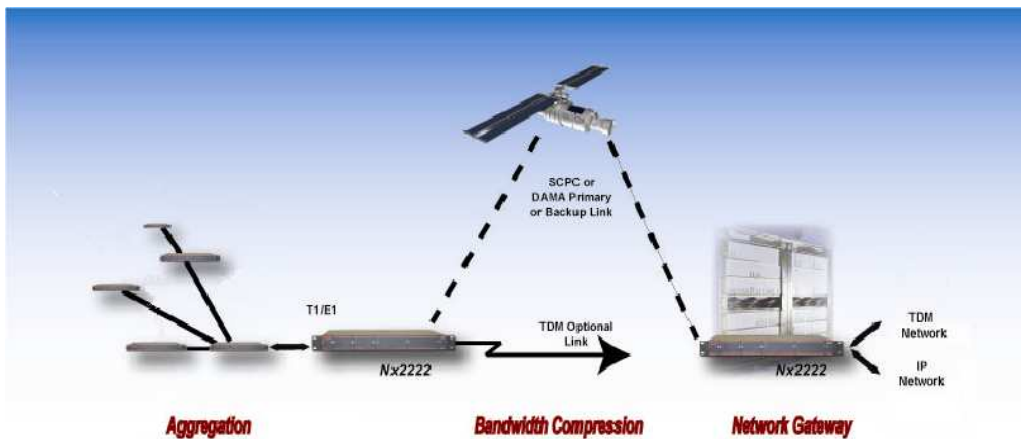
Disaster Recovery Option

The Nx2222 provides a cost effective, manageable solution for backing up TDM network circuits, particularly suited to situations where complete failure of a circuit might cause catastrophic loss of emergency services. Unobtrusive circuitry allows the Nx2222 to monitor TDM links and if failure is detected to automatically "take over" the TDM circuit and route pre-determined traffic onto a designated backup link. In pass-through mode there is no delay through the unit and even complete power failure to the unit itself will not effect operation of the T1/E1 circuit being monitored.

The Netrixview NMS allows remote configuration and control of the disaster recovery functions. A range of parameters of the TDM circuit are monitored with thresholds set to trigger either an alarm for manual intervention, or automatic fail-over to one or more backup connections. Once the primary link is restored traffic may be manually routed back onto the primary connection or automatically switched based on pre-set parameters.

Operation of the backup operation is optimized for operation over satellite or wireless networks but is equally effective for backing up T1/E1 voice/data links over low speed terrestrial networks.

VPN security is also available for protecting sensitive communications.

Nx2222

PSTN Voice Compression

The Nx2222 supports a mixture of both analog and digital PSTN voice connections with compression to a maximum of 28 analog voice ports or 18 digital (T1/E1) trunks per unit, with an overall maximum of 548 voice, facsimile or data (DS0) circuits per unit.

Analog voice ports can be configured for connection to a local PBX or to telephone handsets. The Netrix suite of proprietary compression algorithms provide up to 16:1 bandwidth savings with toll quality voice compression using silence suppression with optional user comfort noise.

Our voice compression technology is used extensively by the military due to its high quality, low bandwidth utilization and includes fixed rate algorithms optimized for low bandwidth satellite networks. Sophisticated queue buffer, jitter buffer and echo cancellation mechanisms are deployed to maintain quality over circuits with long delays such as multiple satellite hops. Synchronizing "chatter" between units can be eliminated when used over bandwidth sensitive satellite links.

The Nx2222 operates seamlessly with the Nx2205A and Nx2205D analog and digital voice access routers. Please see additional data sheets for further information on our extensive voice compression technology and options.

IP Gateway with Packet Shaping

Interoperability is a key element in the Nx2222 design, which also conforms to SIP enabling integration with soft switches and PC-based telephony. The Nx2222 provides comprehensive gateway functions that allow interfacing between different network services and types. For example, the Nx2222 can compress standard G.711 SIP traffic over satellite connections, simultaneously reducing the bandwidth used by a factor up to 16:1 and reducing the number of IP packets transmitted by a factor of 30:1 or more. The standard IP packet overhead of conventional VoIP traffic can be eliminated such that even pre-compressed G.729 SIP traffic can be further reduced by up to 3:1 with no loss of voice quality.

Network Management

The Netrixview network management system provides extensive network operations, administration, and maintenance capabilities. Monitoring, configuration, and administration are accomplished via a color graphics interface, incorporating alarms and statistics with reporting capabilities. The inclusion of Netrix' selectview™ multiple sub-network management allows services such as virtual private networks to be configured, enabling individual customers to have varying levels of security, management and control.

Physical

The Nx2222 is designed for rapid deployment and easy maintenance in Telecom environments. The base unit is 1U high and 13 inches deep (plus cable support bar) and has mounting brackets with three positions for installing into a standard 19 inch rack. Dual redundant power supplies and processor line cards are hot swappable without disturbing network cabling.

The unit includes power failure relay contacts for an external alarm and can accept up to 7 other alarm inputs. Alarm inputs can be optionally converted to additional relay outputs controllable from the Netrixview management system.

Both AC and DC voltage supplies are available and can be mixed in a single chassis.

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Product Features

Specifications
Physical Interfaces

- **T1/E1 (0 - 18) Up to 10 active ports + 8 Fail-over ports or up to 18 partially loaded ports)***
  - Framing: D4, ESF, or G.70x
  - ANSI T1.403, ITU G.703, ITU G.704, ITU G826, TR 62411, TR 54016
  - Line Coding: AMI, B8ZS, HDB3
  - Physical: 4x RJ-48c
  - Selection by module for T1 or E1. Short or long haul, APS 1:1 and 1+1 functionality with revertive and non-revertive mod
  - BERT and loopback diagnostics, software enabled per line or per timeslot

- **High Speed Serial Interface (1 – 10 ports)***
  - EIA-232, EIA-442/449, EIA-530, ITU X.21, ITU V.35
  - Physical: Micro DB26 (optional)
  - Handles Nx56/64kbps data rates up to 12 Mpbs
  - DTE/DCE Options

- **Analog voice ports (2 to 28 ports)***
  - FXS fixed (RJ11)
  - Optional FXS/FXO/E&M software configurable (RJ45)
  - 2 PSTN lifeline connections

- **ALARM port**
  - Relay contacts power fail output alarm
  - 7 contact input sensors
  - Optional 3 contact outputs (replaces 6 contact inputs)

* Max port configurations and loading are dependant on application.

- **Switched Ethernet 4 – 8 ports)***
  - ANSI T1.617IEEE 802.3, 802.1p/Q
  - Physical: 4 – 8 x RJ-45
  - Power over Ethernet (optional)
  - Autosensing 10/100 Mbps Switched Ethernet autosensing DI/DIX (auto-polarity)
  - Optional 10/100/1000 Mbps Gig Ethernet ports (up to 4 port
  - Software configurable switching characteristics, QoS and ToS characteristics

General

- **Physical**
  - Size: 16.6"W x 9"D x 1.75"H (IU height) (419.1 mm x 228.6 mm x 44.45 mm
  - All physical interfaces are on one side to ease cable management in tight confines

- **Power**
  - 30 watts maximum draw (typical)
  - +/- 20vDC to +/- 65vDC, 1.5 amps max
  - +/- 90vAC to =/- 265 vAC, 50-60 Hz, 0.030 amps max
  - Optional PSU redundancy (with load sharing)
  - Optional 110vAC/220vAC external converter

- **Console Port**
  - RS-232
  - Physical: RJ-45
  - Async serial at data rates from 2.4 kbps to 230 kbps, serial settings 8N1 or 7E2, autosensing DTE or DCE mode (auto-polarity)

- **MTBF**
  - >65,000 hours @ +45C

- **Environmental**
  - Temperature: Operating - 4º to +149ºF (-20º to +65ºC)
  - Humidity: 0-95% non-condensing

- **Safety**
  - FCC 47 CFR part 68,
  - IC CS-03,
  - IEC 950,
  - EN 60950,
  - ANSI/UL 60950-1-2002,
  - CAN/CSA-C22.2 No. 50950-1-03,
  - Telecordia GR-63,
  - Telecordia GR-1089
  - CE

- **Other**
  - Telecordia GR-1244,
  - Telecordia GR-3108 (OSP, 07-2004)

- **Optional Accessories**
  - Console Port Adaptor
  - DB-9 to RJ-45 converter
  - Allows the operator to use a standard Ethernet cable to connect to the console port
  - Rack Mounts
  - Mounting ears for 19" or 23" open frame telco racks or enclosed equipment cabinets
  - Front mount, center mount and rear mount options available. Kit includes mounting ears, screws, and instructions
  - Cable support bar
  - Wall Mounts
  - Mounting brackets for perpendicular or parallel wall mount. Kit includes mounting ears, screws, and instructions

Management
- SNMP, SNMPv2, Telnet CLI, SSH CLI, serial CLI, Web browser (HTML, SHTML)

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Specifications subject to change without notice