Nx2500 for Cellular Networks

GSM, the Global System for Mobile Communication is currently the most widely deployed mobile telephony technology in use today. GSM networks need to accommodate both voice calls and associated signaling, which includes routing and data transmission functions for Operations, Administration and Maintenance (OAM) traffic. Since, like most transaction and control data, OAM data has a small payload, the OAM network is most efficiently served by a packet-based solution with the capacity to efficiently handle large numbers of small packets with minimal delay and no errors.

The Netrix Network Exchange (Nx) 2500 family of products from NSGDatacom is an ideal platform to build networks for OAM applications. Many GSM/GPRS operators worldwide currently rely on the Nx2500 Multi-Service Switching platform for OAM infrastructure to carry highly mission-critical Billing and Maintenance information. The Nx2500 is the industry leading scalable wide area switching platform for supporting all commonly used packet-based protocols including IP, Frame Relay, ATM and X.25. The design of the Nx2500 is optimized for high-speed packet switching of all theses protocols, and provides unique benefits for the successful operation of OAM networks that require an extreme level of redundancy and reliability.

Large Installed Base
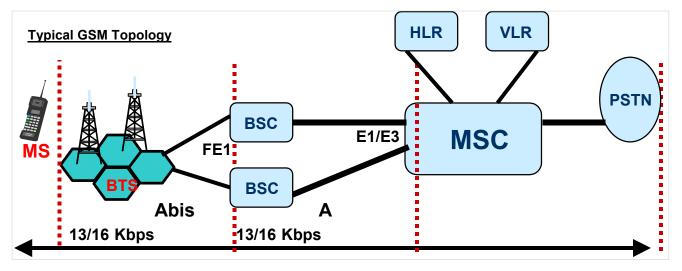
Fault Tolerant Networking

Dynamic Distributed Routing

High Speed Packet Switching

The Nx2500 products offer a NEBS compliant, hot swap, fault tolerant hardware design, with a dual internal bus system, dual redundant Stratum 3 clock sources, and dual redundant AC or DC power supply modules. Additionally, shared configuration, switching and translation tables allow any switching card in the system the ability to assume the role of master and backup the switching functions of all other cards. The software architecture of the switching core allows complete port by port configuration to provide a fully transparent operation across point to point, TDM or packet-based networks, at data rates from sub 64Kbps to over 100Mbps.

For packet switching, full level three support is provided. A true three-window model is used to ensure packets are transmitted end-to-end without loss. Coupled with automatic error detection and correction full data integrity across the network is ensured. Even during link failure, automatic link failure detection and re-routing between switches ensures that data packets are never lost. Coupled with sophisticated network management and remote configuration and diagnostic tools, these are just some of the reasons leading Cellular operators entrust their OAM network and billing information to a network of Nx2500 switches with complete confidence.

The Nx2500 products also offer a migration path to GPRS with support for Gb interfaces provided by Frame Relay and fully fault tolerance networking for frame-based applications. Annex G is supported for conversion between X.25 and Frame Relay.

Typical GSM Topology

Product Highlights

Dynamic Distributed Routing

Netrix has developed a powerful routing algorithm that automatically determines the optimal path for each network connection, yielding optimal efficiency in trunk utilization. This facility frees the network operator from the time-consuming and complex task of developing routing tables each time the network is modified. The routing intelligence is distributed among Nx2500 network nodes, allowing the network to automatically adjust to traffic conditions without intervention by the network operator. Resource groups allow the operator to control routing through the network by user or class of service.

Fast call set-up

The Nx2550 products have the industry's fastest packet-based call setup rate for non-permanent connections (Switched Virtual Circuits). A fully populated Nx2500 core can establish and release over 3000 SVCs every second.

Network Management via GUI

Extensive network operations, administration, and maintenance capabilities are provided for easy and effective management of a Nx2500 network. Monitoring, configuration, and administration are accomplished via a color graphics interface, incorporating alarms and statistics with extensive reporting capabilities. The Netrix' selectview™ offers management at multiple sub levels, such that services can be offered and controlled by operators with varying levels of management and control authority.

Fault Tolerant Networking

Dynamic adaptive routing and cost-effective redundancy of system components eliminates single points of failure, resulting in a network that automatically heals itself to provide 'high 9's' availability for users.

Scalability

Provides up to 96Mbps of fully featured packet switching per Node spread over a few or many hundreds of ports, plus up to 14, E3 rate ATM trunks.

Redundancy
- Fully redundant hardware architecture
- Symmetrical multi-processor N:1 redundancy
- Hot-swappable on all components
- Advanced features for network wide redundancy and load-sharing
- Automatic load-sharing and re-routing on trunk failure
- Call redirect - for application server redundancy
- Address groups – for load sharing and redundancy in mixed environments

QoS Mechanisms
- 4 Levels of priority : crucial for differentiating traffic (such as OSS) which requires minimal end-to-end delay
- Provides service levels for Frame traffic (eg. GPRS)

Multi-Service Architecture

- Easily fills different requirements in single platform
- X.25 for OAM&P carrying OSS / NPR/ BIP traffic
- Frame Relay infrastructure for GPRS
- Circuit-Switching, (eg. for SS7 signaling links)
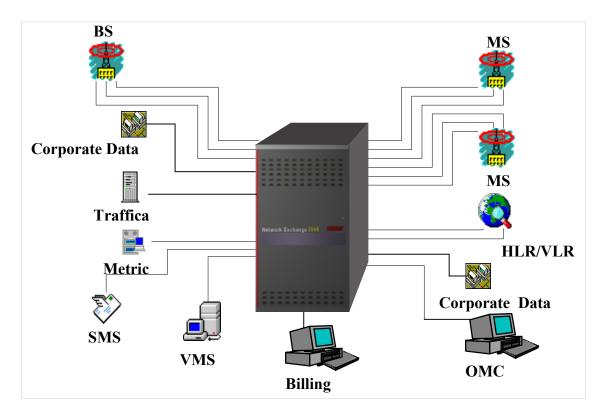- ATM for higher speeds and integration into a core ATM Infrastructure

Netrix Network Management Software
- Extensive GUI / Diagnostics / Troubleshooting / Commissioning / Testing

Netrix Nx2500 Application Description

A number of leading GSM providers in the UK, Africa, the Middle East and South East Asia benefit from the deployment of the Netrix Nx2500 which is currently providing Managed Bandwidth Services in support of their Operations and Management/Provision functions. The Data carried is varied, but typically will consist of Billing files, Statistics, SMS, Cell Broadcast, Home and Visitor location authorization (HLR/VLR/AuC) and BTS/BSC management data.

The fully fault-tolerant hardware and software architecture of the Nx2500 is a key requirement , providing dynamic adaptive routing, self-healing, and as a result high network availability. Costs are reduced due to the scalability and the ability to support packet based protocols as well as providing migration of data to higher bandwidth transports such as ATM and IP.

Netrix Nx2500 Application Diagram

BS

MS

Corporate Data

MS

Traffica

HLR/VLR

Metric

Corporate Data

SMS

VMS

Billing

OMC

NSGDatacom

www.nsgdata.com

| 3863 Centerview Drive
Chantilly, VA, 20151-3232 USA
Phone: +(1) 703 793 2000
Fax: +(1) 703 793 2001 | 7435 New Technology Way
Frederick, MD, 21703 USA
Phone: +(1) 301 662 5926
Fax: +(1) 301 694 6279 | The Brackens, London Road
Ascot, Berkshire SL5 8BE, UK
Phone: +(44) 1344 893 000
Fax: +(44) 1344 891 990 |