

Wireless/Cellular Provider



Executive Overview

In the last few years, wireless providers have experienced two stages of network deployment. The initial stage consisted of building out mobile networks as quickly as possible to gain market presence. This was typically done in tier one markets, in semi-rural areas, and along major interconnecting roadways.

Now wireless providers are focused on offering 2.5G/3G data services, expanding into wireless internet access, and reducing operating costs wherever possible.

Eastern Research has developed a scalable Multiservice Access Concentrator (the DNX Series) that combines the capabilities of a 3:1 DACS, 1:0 DACS and an Access Gateway in scalable and highly reliable NEBS compliant platforms. The DNX Series can be cost-effectively deployed within cell sites, large central hubs and virtual colocation sites to enable a wireless service provider to decrease circuit-provisioning time and reduce costly backhaul charges. The DNX-1u Access Gateway provides global wireless network operators with grooming and powerful remote management features in an integrated 1 RU platform, establishing a clear migration path to 2.5G/3G services and beyond.

Wireless Local Access Networks

The local wireless cellular network consists of a Mobile Telephone Switching Office (MTSO) with cell sites scattered throughout a geographic serving region. T1/E1 landlines (or microwave services) are usually leased from the local carrier to interconnect the cell sites with the MTSO as shown in Figure 1.

The T1/E1s between the cell sites and the MTSO typically are partially filled with traffic due to the encoding format used and the area covered by the individual cell sites. This hub architecture is inefficient, since the T1/E1s are leased and have a recurring monthly cost associated with them. And, the ability to remotely manage all equipment at the unmanned cell sites presents an additional challenge.

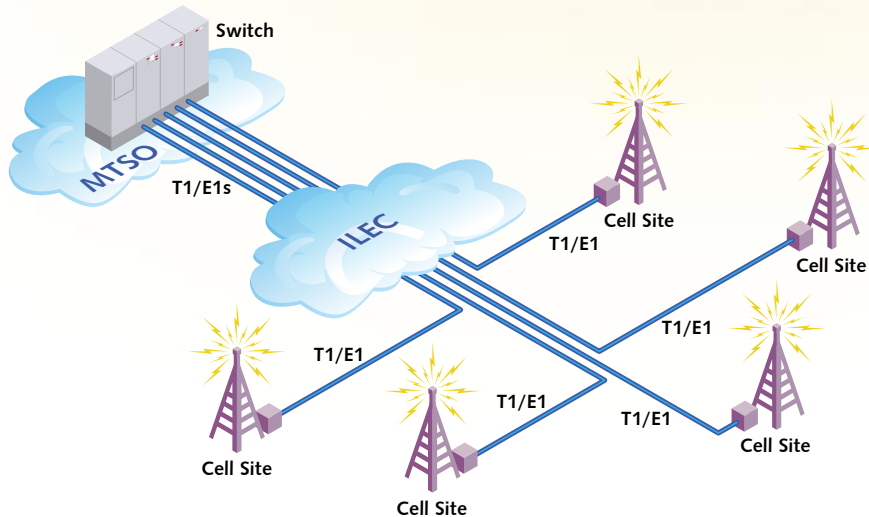


Figure 1, Traditional Wireless Network Topology

- Minimize Recurring Backhaul Bandwidth Expenses
- Simplify Remote Management/Diagnostics
- Optimize 2G/2.5G/3G Migration
- Consolidate Cell Site Equipment



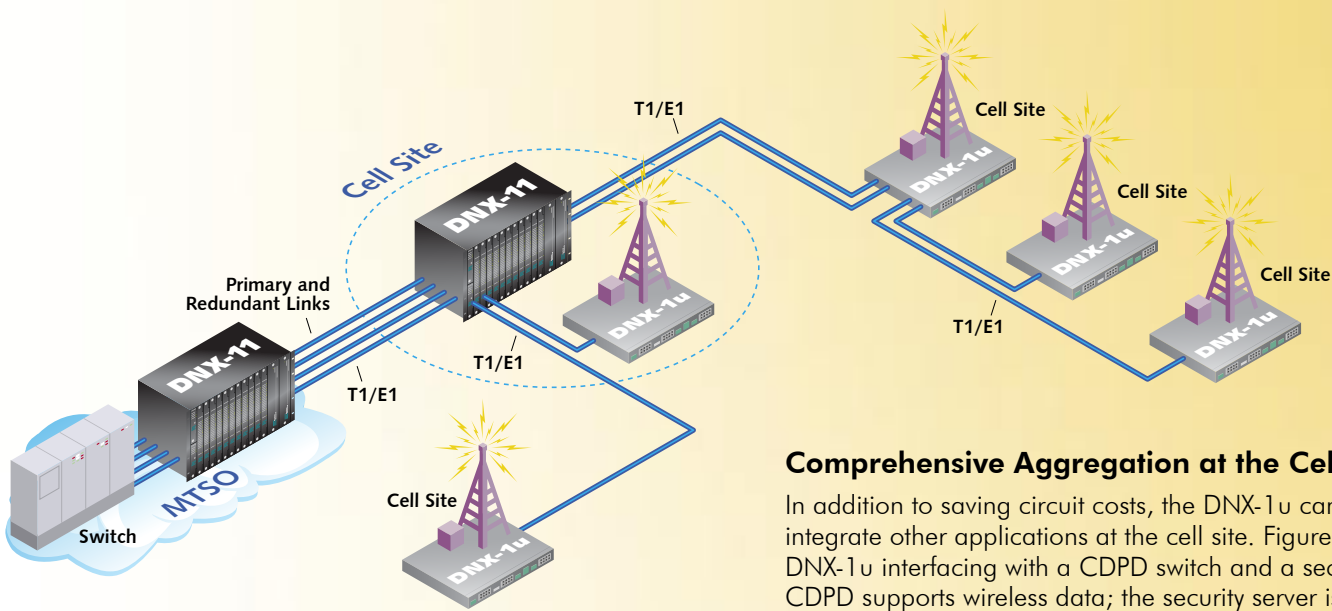


Figure 2, DNX Multi-Level Aggregation

DNX Series Applications and Benefits

DNX applications in wireless local access networks generally fall into two categories: Second-Stage Aggregation (typically DNX-11), and Base Station Aggregation (DNX-1u). As shown in Figure 1, operators can deploy both applications in concert for maximum efficiency and benefit.

Multiple Levels of Aggregation

By deploying DNX-11's within the large hub cell sites as second-stage aggregators, and a DNX-1u at each cell site for base station aggregation, a wireless provider can dramatically reduce the number of T1/E1 circuits needed to backhaul traffic to the MTSO. These savings normally result in an extremely aggressive hardware payback period.

The DNX also can provide back-up services by using its Automatic Protection Switching (APS) capabilities to protect critical T1/E1 circuits.

Optimizing 2G/2.5G/3G Migration

The majority of wireless providers are in the process of migrating their networks from analog to digital 2G/2.5G/3G services. Both the analog and new digital networks must reside side-by-side during a lengthy transition period. Consequently, the wireless provider must backhaul two or more different networks to the MTSO. These realities further illustrate the benefits of the DNX in grooming applications.

The DNX-1u can be used within the cell site to eliminate the need to backhaul separate cell service networks to the MTSO by grooming multiple services onto a lesser number of circuits, as shown in Figure 3.

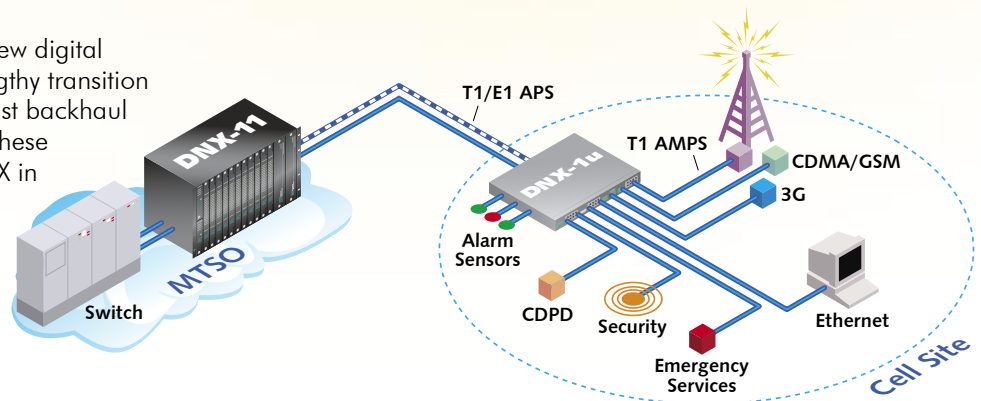


Figure 3, DNX 2G/2.5G/3G Service Application

Comprehensive Aggregation at the Cell Site

In addition to saving circuit costs, the DNX-1u can also integrate other applications at the cell site. Figure 3 shows the DNX-1u interfacing with a CDPD switch and a security server. CDPD supports wireless data; the security server is used to support RF fingerprinting applications used for authentication and to block fraud. These applications were previously backhauled over separate circuits, increasing recurring operational expense.

For cell sites that have been upgraded to Ethernet LANs to more efficiently transport data and management traffic, a Channelized Router Hub Module set is available for the DNX-11, as well as an integral 10/100 Ethernet switch/router in the DNX-1u. As a result, all voice and data requirements within a cell site can be served by a single DNX-1u platform.

Building alarms can be monitored via sixteen alarm sensors on the DNX-1u. The DNX-1u also provides eight voltage measurement inputs, as well as six contact outputs, to signal or reset remote devices. An integral terminal server and six EIA-232/V.24 ports provide remote connectivity to async craft interfaces. Technicians can access the company's intranet to download number assignments by directly connecting a laptop to the DNX-1u's integral 10/100 Ethernet switch/router and logging on to the network located at the MTSO. This interface can also provide SNMP-based management access to IP-enabled devices at the cell site.

DNX-11 and DNX-1u from Eastern Research – a powerful combination for optimizing mobile carriers' wireless local access networks.



© 2003 Eastern Research Inc.
225 Executive Drive
Moorestown, NJ 08057, USA
1-856-273-6622
Fax: 1-856-273-1847

Eastern Research Inc., an ISO 9001-certified company, designs, manufactures, markets, and supports the DNX and Frontera® Series of Multiservice Access Concentrators and Access Gateways, TAS line of Test Access Systems, and a broad range of Internetworking and Tech Control products. The company recently introduced its line of Element Management Systems, ENvision and ENvision Plus. Eastern's bandwidth management solutions enable network operators worldwide to reduce operational infrastructure costs while improving network reliability. Frontera is a registered trademark of Eastern Research Inc.