PATTON SOLUTION

Bureau of Administration of Industry & Commerce
Jiangsu Province, China
LAN-WAN Network Topology

Layer 3 Switch — Ethernet LAN

Model 2707/I — Jiangsu Bureau, Nanjing

E1/Network

Model 2707/C

V.35 · V.35 · 15 Ethernet LANS · V.35 · V.35 · 15 City Bereaus

E1/Network

Model 2707/I · 123 Ethernet LANS · 123 County Bureaus
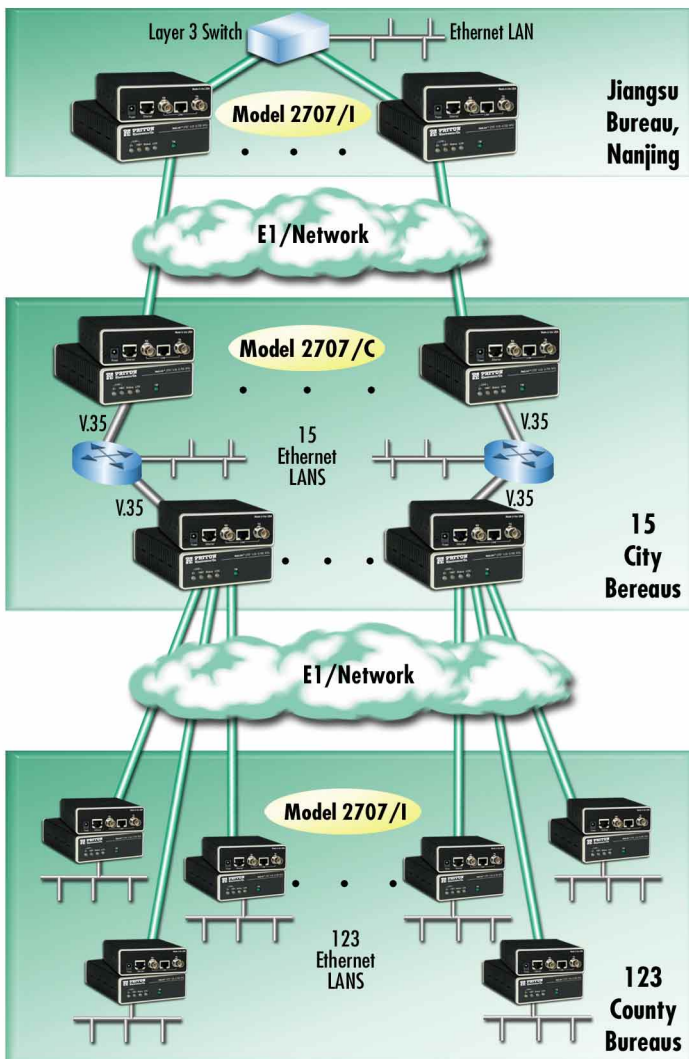
Wide Area Ethernet Over E1 . . .

Patton G.703-to-Ethernet Converters Hit Price/Performance Targets for Jiangsu Province, China

Background

Having achieved entrance into the World Trade Organization, China's leaders are committed to boosting government productivity by creating an efficient new e-administration. The emerging electronic government is building an improved network to provide such online services as company registrations, annual filing, and sales receipts validation. To deliver these services, formerly disparate local systems must be integrated to allow access to shared information, servers, and applications.

"Patton's Model 2707 proved both a viable and affordable solution. It performs very stable at a reasonable price."

Consider Jiangsu Province's Bureau of Industry and Commerce in Nanjing, which governs branch

Shan Rong, Manager
Bureau of Administration of Industry and Commerce
Jiangsu Province, China

offices in 15 cities and 123 counties -- each with it's own Ethernet LAN. For Shan Rong, the Bureau's manager, joining those 140 local nets into a single WAN posed a more-than-trivial challenge.

The Problem

Since clear-channel E1 is very low cost and readily available throughout China -- even more than framed E1 -- choosing G.703 for WAN link transmission service was a given. But finding a G.703 NTU that could hit both budget and performance targets was a much bigger problem . . . until Patton introduced Shan Rong to the Model 2707 series Lowest Cost G.703 NTU.

Stability

Since the Bureau's network carries critical real-time data, availability is a key concern. The Bureau's initial NTU solution underscored this concern when equipment from a local manufacturer malfunctioned, causing unacceptable down times.

Key Benefits for LAN-WAN Administrators

✔ **Highly Stable Connection**
For Critical Real-Time Applications

✔ **Affordable Solution**
Meet Your Budget Constraints

✔ **Quick and Easy Installation**
Virtual Plug-and-Play Saves Time and Resources

✔ **Space-Saving CPE and CO Solutions**
Compact Stand-Alone and High-Density Rack Card

✔ **Flexible Serial or Ethernet Connectivity**
V.35, X.21, or 10Base-T Interface Options

✔ **Reliable and Trustworthy**
Made in USA Under Strict ISO 9001 Guidelines

The Technology: Ethernet to G.703

The genius of the 2707 series lies in its simplicity -- avoiding complex higher layer protocols where not needed, and favoring simple low-level protocols where they do the job. The Model 2707/I provides interface conversion between E1 and Ethernet while Model 2707/C provides a V.35 serial interface. The 2707/I combines Point-to-Point Protocol (PPP) with Bridge Control Protocol (BCP), and uses (layer 2) MAC learning and forwarding to create a communications bridge over an E1 line between physically distinct segments on the same Ethernet LAN.

At the county office. The 2707/I examines the MAC address of each packet. When the address is recognized as a known local host, the packet is ignored. When the address is NOT recognized, the 2707/I forwards the packet to the LAN segment at the city office. By encapsulating packets within (PPP) for transmission, the 2707/I can extend the bridged link across a G.703 clear-channel E1 line at 2.048 Mbps.

At the city office. The network is partitioned at the city office level where a router is deployed providing data aggregation to the Jiangsu central site (upstream) and security functions to the counties (downstream). On the downstream side, a 2707/C receives incoming packets from the E1 interface and forwards them to the Router's V.35 port, configured as a PPP-to-IP half bridge. The router examines the IP address of each packet, and uses (layer 3) IP routing to forward packets to either a local host at the city office, or a host on the Jiangsu central site LAN (via PPP/BCP over E1).

Elegant Efficiency. For access application environments such as the Jiangsu central and county offices, the simple MAC forwarding algorithm in Patton's 2707/I series does the job far more efficiently than the complex routing algorithms required by a full-featured IP protocol suite. The resulting benefit: Patton's E1-to-Ethernet NTU runs 50% faster than a router-plus-NTU combination.

Competition Missed the Target

Although the market offers plenty of alternatives, other E1 NTUs failed to meet the Bureau's combined budgetary and performance requirements. As the Bureau considered the alternatives, they all seemed to fall into one of two categories: (1) high price, or (2) low quality. According to Shan Rong, "Products from local companies are cheaper. They can easily meet our budget. However their product quality is not as high as their price -- stability is a big issue. Products from foreign companies are high-quality, but their prices are too high."

Patton Hit The Bull's-Eye

For Jiangsu Province's Bureau of Administration of Industry and Commerce, Patton's Model 2707/I G.703 NTU hit the price/performance bull's eye. As Shan Rong put it, "It performs very stable at a reasonable price ."

And when the Bureau found out how easy it was to install and configure... well, that clenched it. "Also, it is very compact and well designed. It has a variety of interfaces and can be easily installed into our network," Shan Rong said.

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Best of Both Worlds

By selecting Patton's Model 2707 series, the Bureau cut costs three ways 1) Low-cost interface conversion, 2) Low-cost E1 NTU, and 3) Eliminating router duplication at the county remote sites. In summary, Patton's solution gave the Bureau a hierarchical network design using low cost elements, satisfying engineering ideals within the financial limitations of the real world.

Performance To Date

Since Jinagsu's network is a fresh implementation, MTBF statistics are not yet available. However, as this article goes to press, their new system is completely stable, boasting continuous uninterrupted uptime for three months and counting.

For More Information...

Remote Router Porting with E1 White Paper
http://www.patton.com/support/pdf/E1_RRP_PositionPaper_lo-res.pdf

Model 2707 G.703 NTU
http://www.patton.com/cgi-patton/catalog-bin/display.cgi?model=2707

Model 2701 G.703/G.704 NTU
http://www.patton.com/cgi-patton/catalog-bin/display.cgi?model=2701A

About Patton

Patton Electronics Company is a US manufacturer and marketer of data communications products, including Remote Access Products (V.92, V.90, K56Flex, V.34+, and ISDN dial-in), Last Mile/Local Loop Access Products (T1, E1, and xDSL modems, DACS, NTUs and CSU/DSUs), Multi-Service Access Products (Voice, Intranet, Extranet, and Frame Relay access), and Connectivity Products (interface converters, short range modems, multiplexers, and data line surge protectors). Patton Electronics is an ISO 9001 certified and BABT approved manufacturer. Patton products are CE marked.

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Extending, Converting & Converging

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