





Southwest Telecommunications Cooperative



PARALLEL TECHNOLOGIES, INC.





Creating a
converged
voice/video/data
network
helps bring
Minnesota schools
into the
21st Century.



Why VoIP?

“By using voice over IP (VoIP) to shift telephony traffic from external phone lines onto our private data network, we expect to save between 30 to 50% on toll charges. But the cost savings haven’t stopped there – we’re also seeing a reduction in the numbers of phone lines that are needed to support each site, because site-to-site calling is such a large percentage of our overall telephony traffic patterns. We already had an extensive network of point-to-point T1 lines in place for our videoconferencing/distance learning programs, and now we’re getting more mileage out of our T1s by using them for voice traffic, too.”

— Rod Wrege,
Director,

Southwestern Telecommunications Cooperative

Finding new ways to deliver telephony, videoconferencing, and data services is difficult in a networking environment that has 44 sites distributed across 6000 square miles. Similar to the challenges faced by businesses with offices in multiple locations, overcoming the distances between member school districts has always posed a tough problem for Southwest Telecommunications Cooperative (SWTC). To find new, cutting-edge solutions, SWTC turned to Parallel Technologies, Inc., a Minneapolis-based data network integrator and a Premium Nortel Networks Partner.

Together, SWTC and Parallel Technologies developed new technology solutions designed to reduce costs by putting voice, video, and data traffic onto a converged network architecture. The new environment consists of fiber, wireless, and point-to-point T1 circuits that connect the central site in Windom, Minnesota to each of the member schools. Policy-based networking ensures latency-free voice and video services across the SWTC network.

In addition to telephony, distance learning, and data networking, SWTC provides network design, configuration, installation, and network management services to the member districts.

The Challenge

Reduce operating costs while delivering new, enhanced telephony and videoconferencing services over a converged IP network

SWTC's original goal was simply to decrease toll charges between the member districts by shifting telephony traffic onto the existing IP network. To accomplish this goal, Parallel Technologies suggested that SWTC deploy Nortel Networks Business Communications Manager, a next-generation voice/data networking platform that uses both digital and Internet Protocol (IP)-based technologies to transmit voice signals.

Parallel Technologies recommendation of using a Voice over IP (VoIP) solution to reduce toll charges was geared to deliver a solid return on investment (ROI) for the SWTC member districts, with anticipated toll charge reductions from 30-50%. And once SWTC became familiar with the extensive features offered by the breakthrough Business Communications Manager voice/data platform, they realized that they could deliver a converged network architecture capable of supporting advanced features such as unified messaging, contact centers, and remote management.

Although SWTC had been providing both videoconferencing/distance learning and data networking services in the past, providing phone service and H.323-



Business Policy Switch

compliant video would require a network upgrade. Bandwidth availability and its associated costs were another challenge that had to be met to ensure that resources were used efficiently. In an environment where the network would carry heavy phone traffic from 7-4 pm, but only required 2-3 hours of support for video conferencing/distance learning services, continuing to dedicate half of the available bandwidth to multimedia traffic no longer made sense.

Before the network rebuild began, SWTC faced the following challenges:

- Expensive “nailed up” T1 connectivity was required on a continuous basis to support video services
- Distance between sites required that the network be manageable from a central location
- Differing network priorities demanded that policy-based networking be implemented to ensure low-latency voice and video
- Existing digital phone handsets needed to be reused to contain costs
- Offsite and mobile workers needed access to unified messaging services from remote locations
- Voice services needed to be provided to campus outbuildings in a cost-effective manner



Business Communications Manager

The Solution

A policy-based network with prioritization for voice and video traffic, plus best-effort data transfers, on a single cost-effective network.

When the cooperative began to consider its options for a VoIP solution, they compared the performance of Nortel Networks Business Communications Manager with competing solutions offered by third-party vendors. As they made their comparisons, several critical factors emerged:

1. The Nortel Networks solution supported both digital and IP phones on a single platform, an essential element in the push to contain costs.
2. Business Communications Manager provided remote management capability, a key consideration for SWTC – a company that operates with limited administrative personnel in an environment where sites can be hundreds of miles apart.
3. Nortel Networks Business Policy Switch provided four levels of traffic prioritization, an essential consideration for this environment. Levels one and two are allocated to voice and video traffic; level three for finance, payroll, and accounting data; and level four for email, Web browsing, and other best-effort tolerant data transfers.

4. Business Communications Manager offered the best range of advanced telephony services, including CallPilot* unified messaging, contact center support, wireless eMobility* solutions, and universal Internet access for all connected workstations.

A Flexible Solution with Virtually Limitless Potential

When SWTC first considered installing Business Communications Manager, their original intent was to provide IP-based trunk connectivity between sites. This approach enables them to realize the cost advantages of VoIP without replacing their existing digital phones. But as they became more familiar with the broad range of features offered by Business Communications Manager, several line-side benefits have also emerged.

IP Phone Deployment. One of the sites has two buildings on campus, and there is already fiber Ethernet network connectivity to the mechanical and agricultural shops in the remote building. This presented an ideal opportunity to cut costs by using Business Communications Manager's ability to support IP phones in addition to digital handsets. As Rod Wrege remarked, "The cost of cutting across parking lots, doing directional boring, and running copper would be absolutely cost-prohibitive. We only need a couple of handsets in the second building, and the ability to install IP phones that connect over the network is saving us a fortune."

Wireless Phone Deployment. At another site, SWTC needed to supply telephony service to a bus garage that was located four blocks from the main building. By deploying a 2.4 GHz wireless link, SWTC was able to provide cost-effective connectivity for multiple IP phones at the remote site.

Key Features and Applications

- **Reduces operating costs** By shifting voice traffic onto the IP network, telephone toll charges can be reduced from 30 to 50%, the need for individual phone lines reduced, and the utility of existing T1 lines maximized.
- **Supports digital and VoIP telephony** A hybrid solution, Business Communications Manager supports both digital and IP phones, dramatically reducing installation costs by eliminating the need to replace most existing digital handsets.
- **Provides remote management** Business Communications Manager can be securely accessed and managed from any Web browser-enabled workstation on the network. This dramatically reduces the need to send management personnel onsite, reducing costs and increasing the efficiency of key employees.
- **Extends unified messaging** CallPilot delivers a full range of messaging services that can be accessed via any touchtone phone or Web browser. Voice messages can be played back, saved, or forwarded; faxes can be received into email and printed from any workstation, or forwarded as email; and email can be accessed from any Web-enabled workstation.
- **Facilitates creation of contact centers** Users can call into contact centers for support from any location. Students that need extra help with homework can speak directly to a tutor or teacher who can help them. This is facilitated by the system's capability to support agents at a centrally located call center, distributed across the network, or even located at home.
- **Includes FaxManager response system** By calling into a central number and navigating through a series of touchtone prompts, students can receive homework assignments by fax. This is especially valuable for distributing assignments from instructors teaching distance learning classes over the video network.
- **Features broadband phone support** Business Communications Manager provides full support for the IP-based Nortel Networks i2002 and i2004 Internet Telephones and the i2050 Software Phone. Supported digital phones include the Norstar* and Meridian* handsets, Business Series Terminals, as well as certain phones from third-party vendors.
- **Delivers reliable 911 call handling** Emergency calls are automatically routed onto a local analog line, ensuring that the call will accurately display its point of origin on the city's 911 console. This key capability enables response teams to be dispatched directly to the site that has phoned in the emergency.

Plug-and-Play DHCP Connectivity.

Unlike digital handsets that must be operated from a specific location on the telephone network, IP phones deliver almost limitless flexibility. Users can take their phones with them and plug into any VoIP capable port on the network, at any location, and instantly receive a dial tone. This frees network managers from having to administer constant moves, adds, and changes, increasing the effectiveness of valuable, highly-trained, and expensive personnel.

Soft Phone Support. Using the Nortel Networks i2050 Software Phone brings another level of flexibility to mobile users. Simply by installing software onto a laptop or PC and connecting the Nortel Networks USB headset, mobile workers can connect from anywhere on the network and receive service that is virtually identical to their regular desktop connection. This includes advanced services such as unified voice/fax/email messaging, Caller ID, and more. Ideal for users checking into a “hotel cube” at a remote site, this next-generation approach enables users to work just as effectively from their laptop as if they were in their home office.

Wireless Connectivity. An additional benefit is full support for the Symbol Wireless 802.11b system available with the release of Feature Pack 1. When Nortel Networks Access Point broadcasting stations are installed, users can have full wireless phone connectivity at any supported area on the network. This is ideal for both mobile network support personnel and other individuals on the go, such as facilities maintenance workers, security guards, or playground safety personnel.

Unified Messaging/Remote Voice Mail Access. When users call in for voice mail from anywhere on the network, their call is automatically forwarded directly to their home office. This means that users only need to have a single voice mailbox. If a call comes in when a user is out of the

office or on the phone, a CallPilot message automatically pops up on the MS Outlook window, informing them that they have received a call. CallPilot provides unified messaging, enabling users to receive and forward voice messages, faxes, and e-mail from a single window.

Remote Management Reduces Costs and Increases Productivity From System Administrators

Unified Manager

One of the key drivers in SWTC’s decision to choose Business Communications Manager was the ability to use Unified Manager software to control the network from a central site, a capability that was not available from competing products. As Rod Wrege remarked, “Remote management made Business Communications Manager the only system we could consider – we don’t have the personnel to drive 150 miles just to move a phone set.”

The powerful Unified Manager management software enables SWTC to manage Business Communications Manager devices either from their central site or from any browser-enabled workstation. Once the network is installed and configured, it can easily be managed remotely, eliminating the hassle and expense of going onsite just to perform moves, adds, and changes. Unified Manager is included in the purchase price of Business Communications Manager, contributing another key element to the most cost-effective hybrid digital/VoIP solution on the market.

Optivity Policy Services

In a converged network resources are even more valuable, and need to be efficiently managed to deliver maximum performance. Voice, video, and data traffic all compete for the same resources, creating a need for policy-based traffic management. To meet this challenge, Nortel

Networks developed Optivity* Policy Services, a proactive management tool that prioritizes business-critical network traffic, including low-latency voice and video.

This powerful software application delivers a system-level solution for converged environments. Policy-based management ensures that performance thresholds for voice and video transmissions are met, and that Quality of Service (QoS) levels are established and maintained across the network. According to Rod Wrege, “Optivity Policy Services lets us make time-of-day QoS changes that map to our curriculum schedule, so we can get the best possible performance from our network.”

Why Nortel Networks?

SWTC chose Nortel Networks to help them implement their VoIP network for three reasons: 1) A wide range of features that were not available from other vendors; 2) The opportunity to save close to 50% on their upgrade by reusing their existing digital phones; 3) A history of superior service and support from Nortel Networks on their existing Nortel equipment. Although there are network components from several vendors on the network, SWTC’s installation is comprised primarily of Nortel Networks gear.

“We’re primarily Nortel, and our WAN is 100% Nortel. There’s a good reason for that – it’s because of the service and support that we’ve received from Nortel since Day 1. Nortel Networks has really bent over backwards to serve us.”

*– Rod Wrege,
Director,
Southwest
Telecommunications
Cooperative*

Solution Overview

Company name Southwest Telecommunications Cooperative <http://www.mntm.org/>

The service A converged voice/video/data network supporting distance learning, voice, email, and Internet services to over 30 sites, including remote management from the central site

- The solution**
- Nortel Networks Business Communications Manager
 - Nortel Networks Business Policy Switch
 - Nortel Networks BayStack* 450 Switch
 - Nortel Networks Passport* 6480 Multiservice Edge Switch
 - Nortel Networks Backbone Concentrator Node (BCN) and Access Node (AN) Routers
 - Digital phones, including the Nortel Networks Business Series Terminals, Norstar, and Meridian handsets
 - VoIP phones, including the Nortel Networks i2002 and i2004 Internet Telephones and the i2050 Software Phone
 - Symbol NetVision Wireless VoIP phone
 - Optivity Policy Services

Key benefits for Southwest Telecommunication Cooperative

- VoIP reduces toll charges and increases the utility of existing network resources, including T1 lines
- Remote management contains costs and increases the efficiency of network management personnel
- Feature-rich solution enables SWTC to offer a broad range of services over a single, converged network environment
- CallPilot unified messaging enhances personal productivity
- Direct 911 calling capability ensures school safety



For more information, contact your Nortel Networks representative or call 1-800-4-NORTEL (1-800-466-7835), or 1-506-674-5470 outside of North America.

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