Cisco

Customer

Thirteen Great Reasons to Choose

Cisco for IBM Internetworking

Profiles

Cisco Systems

Contents

Cisco has developed solutions that enable our customers to leverage their mainframe and application investments while taking advantage of the latest advancements in technology.

C isco Systems offers the most comprehensive set of internetworking solutions for IBM environments.

Mainframe computers hold more than 70 percent of the world's data and handle mission-critical transactions for the world's largest companies. Cisco has developed solutions that enable our customers to leverage their mainframe and application investments while taking advantage of the latest advancements in technology.

Technology is changing rapidly, and to be competitive, companies need to leverage technology while minimizing disruption and cost. Cisco's channel-attached routers, campus switches, and branch office solutions enable customers to build infrastructures today that transport both Systems Network Architecture (SNA) and multiprotocol traffic, protect existing service levels, improve availability and performance, and are manageable. These same infrastructures address tomorrow's requirements as well.

- Cisco's channel-attached routers support both SNA and TCP/IP on the mainframe.
- The Channel Interface Processor (CIP) supports conversion between TCP/IP and SNA, enabling companies to extend mainframe access to Web clients—without changing the mainframe!
- Cisco's Data-Link Switching Plus (DLSw+) allows an enterprise to build an intranet that carries both SNA and TCP/IP traffic—in a way that SNA traffic is not delayed by Web downloads!

Over the next five years, more and more enterprises will add TCP/IP applications to their mainframes. In addition, they will extend mainframe access to new TCP/IP clients. These changes will not occur all at once. It is vital that your infrastructure and mainframe channel solutions permit coexistence and simplify migration so that changes can be made easily and quickly at minimal cost. Cisco offers the solutions today that meet the needs of tomorrow.

Thousands of enterprises worldwide have seen the value of Cisco's IBM internetworking solutions, making Cisco the leader with more than 350,000 SNA routers installed. Cisco channel-attached routers are used in over half of Fortune 500 enterprises. Why did these customers choose Cisco? Are they happy with their decisions? You'll find the answers to these questions in the real-world scenarios profiled here.

> "We can continue to operate our legacy systems while taking advantage of newer technologies."
>
> *Jaime Gutierrez*
> *Subdirector of Connectivity Studies*
> *BITAL*

Mainframe computers remain the workhorses of large financial institutions. The challenge comes with integrating these legacy Systems Network Architecture (SNA) networks with newer networks based on protocols such as TCP/IP.

"Supporting our bank branches requires us to consolidate resources and to manage SNA and TCP/IP traffic in an integrated fashion," says Eduardo Sotelo, Wide Area Network Manager at Grupo Financiero BITAL, one of Mexico's largest banks with eight financial services divisions.

BITAL has several mainframe computers operating in IBM's Parallel Sysplex configuration, which run Multiple Virtual Storage (MVS), Customer Information Control System (CICS), and online transaction processing applications such as Hogan Systems' banking software. BITAL's dependence on its extensive host-based resources led Sotelo and his colleagues to the Cisco Systems Channel Interface Processor (CIP). Easily installed in Cisco 7000 series routers, the CIP gives IBM and IBM-compatible mainframes multiprotocol internetwork access by connecting directly to the channel. It delivers TCP/IP and SNA traffic, augmenting or replacing expensive intermediary equipment such as interconnect controllers and front-end processors (FEPs).

"We have a complex SNA environment," says Jaime Gutierrez, subdirector of connectivity studies. "We want to increase connectivity options and create a more modern network infrastructure. The Cisco routers are an important part of this plan."

BITAL currently relies on IBM 3745 and 3746 FEPs and a 3172 interconnect controller to manage traffic to and from its mainframe complex. It's an effective architecture for supporting SNA sessions, but it lacks the flexibility and scalability of the router-based solution. "The IBM 3745 ran out of resources like memory and CPU when we reached 1000 PUs, which has become a limitation as traffic from the branches grows at a rapid rate," says Gutierrez. "It's not as productive as the CIP technology, which we plan to use to scale well beyond 1000 sessions. Also, routers are much less expensive to purchase and maintain than the IBM devices."

The router-based CIP platform establishes an architecture for long-term growth. BITAL currently has 1575 branches throughout Mexico and expects to have 2000 soon. Most rely on NetBIOS-based LANs for file sharing, print services, and access to the Token Ring WAN. Routers in each branch provide translation services. "We adopted Cisco's router platform because it supports multiple protocols, which enables us to direct lots of types of traffic around the network," explains Sotelo. "Also, the CIP card can be used to off-load TCP/IP resources formerly consumed by the mainframe. It uses Cisco IOS™ for S/390 and TCP Assist to deliver those work cycles to the router."

Maintaining connectivity between the data center in Toluca City, a remote office in New York, and the hundreds of branches throughout Mexico is Sotelo's most important task. "We must have total up-time for transaction processing, so we are creating a network architecture with inherent fault tolerance," he says. "For example, we can use the router as a failover for our Token Ring interfaces. If a front-end processor goes down, the CIP

will immediately take over the load. We want to guarantee 100 percent service availability to the branches."

BITAL currently has CIP cards installed in two Cisco 7507 routers and is planning to purchase more in the future. "Performing channel interface processing and network routing through the same device reduces operational costs, increases functionality, and improves performance," Gutierrez concludes. "Cisco has helped us with the

transition to a more cost-effective network. We can continue to operate our legacy systems while taking advantage of newer technologies."

Sotelo concurs: "We're just beginning to understand the CIP's full capabilities, but we're already impressed with what it can do. It's a good solution for consolidating SNA and multiprotocol networks, guaranteeing service levels, and prioritizing an enormous volume of traffic."

Internetwork Topology

- Unisys mainframes
- Tandem mainframe
- DEC AlphaServers
- UNIX servers from IBM, Sun, and Silicon Graphics
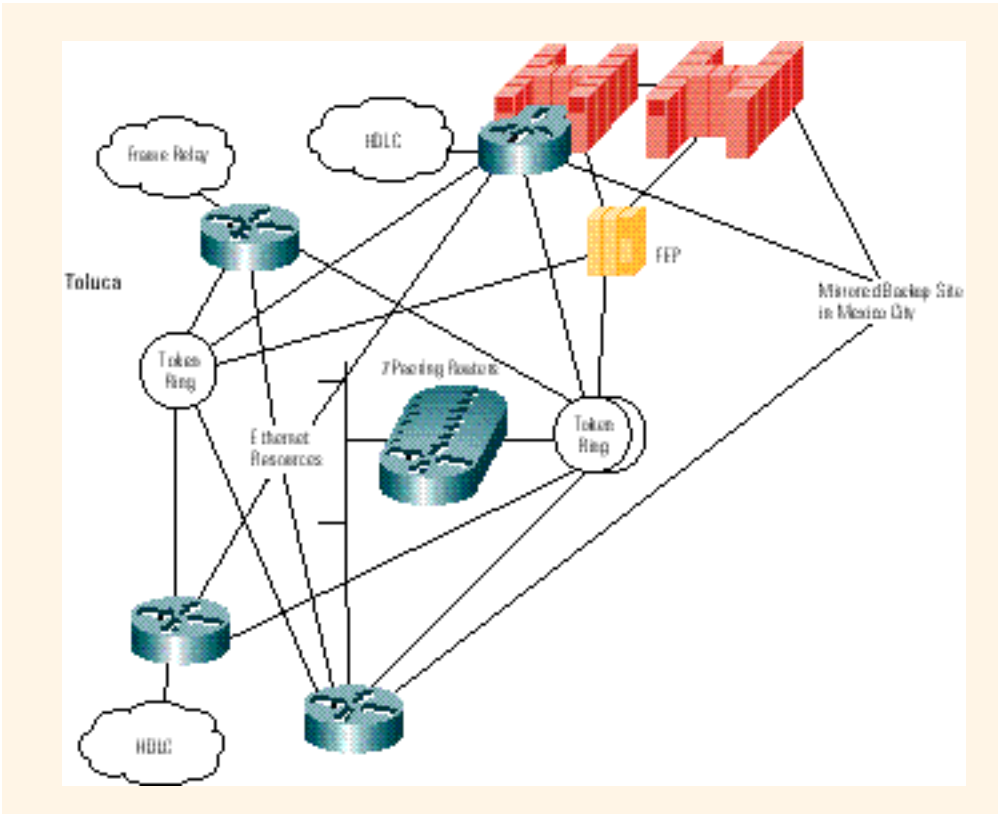- Windows PCs
- Macs

Cisco Systems Products

- Cisco 7507 routers (two with CIP)
- Cisco 7513 router
- Cisco 4500 routers
- Cisco 4700 routers
- Cisco 2500 routers
- Cisco AS5300, AS5200, and AS5100 dial-up servers

Protocols

- TCP/IP, DECnet, IPX/SPX, SNA, LAT, NetBEUI, NetBIOS, AppleTalk

Network Interfaces

- Frame Relay, Ethernet (10BaseT, 100BaseT), ATM, FDDI, Token Ring, SDLC, HDLC, PPP, SLIP

Cisco routers and CIP have enabled BITAL to modernize its infrastructure and increase connectivity options to support more than 1500 branches throughout Mexico.

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"We went to Cisco immediately because we had to have the best possible, guaranteed hardware solutions."

Robert Hazel
Information System Network Engineer
BCBSSC

Blue Cross Blue Shield of South Carolina (BCBSSC) is an insurance company with a rapidly expanding network connecting 7500 employees across seven major sites. BCBSSC attributes its recent leap in growth to winning new contracts in both private industry and the government.

Although the company's success is welcome, it has caused a dramatic increase in network demand as new users have been added. To help remain competitive in the face of this growth, BCBSSC upgraded its network with Cisco Systems products.

The strength of the network directly impacts BCBSSC's success. The company's mainframes contain important, confidential data in the form of patient records and insurance claims. To best serve their customers, BCBSSC employees need to enter and access this information as quickly, securely, and reliably as possible.

Prior to the Cisco upgrade, the network was limited in capacity, availability, and flexibility. Data was transferred to the main data center over T1 lines, which had filled to capacity. Frequent hardware failures compromised network availability. And when it became necessary to service the network, all work had to be accomplished after hours, causing strain on the staff.

Furthermore, some of the users had IP requirements that could not be addressed. To reduce overall expenses such as office space

required for new employees, BCBSSC wanted to enable workers to telecommute. However, the only existing means of data entry was via coax-connected terminals, which required workers to be on site. "We were growing so fast, we knew that we had to make a change in technology," says Robert Hazel, Information System Network Engineer. "We went to Cisco immediately because we had to have the best possible, guaranteed hardware solutions."

BCBSSC connected its remote sites with Cisco 4700 and 2500 series routers and linked them to the data center with Cisco 7507 routers attached to the mainframes via Channel Interface Processors (CIPs). The company also added Cisco AS5300 universal access servers and the PIX™ Firewall for dial-in users. The new network provides a more scalable solution with faster, secure access to the Customer Information Control System (CICS) applications over the WAN. In addition, the CIPs not only support both Systems Network Architecture (SNA) and TCP/IP, but also run TN3270 Server, allowing remote and PC users to access the mainframe

applications without any retraining costs.

As a result, all BCBSSC workers have easy access to the mainframe applications, regardless of location and client type. Now the network can accommodate its growing, diverse pool of users, and they can enter and access data in real time. As growth continues, BCBSSC plans to add two or three more CIPs to improve mainframe accessibility for affiliates.

The new Cisco solution also ensures network reliability and uptime. Because changes can be made "on the fly" with no impact to productivity, BCBSSC can now move toward its goal of a 24 x 7 schedule with minimal planned downtime. "Uptime is our bread and butter," Hazel says. "You can't make those online changes with other hardware. The CIP's greatest strength is its flexibility and management capabilities."

"Cisco's field support has also been terrific," continues Hazel. "The ease of installation was refreshing. The hardware was installed with little or no delay, and if we did run into a snag, the Cisco systems engineer was there. He knows what we're doing and what we have planned."

BCBSSC is now ordering the CiscoWorks network management series of products to help the company manage its growing network. "Cisco has the most comprehensive management solution, which will provide SNA and IP resource information about the consolidated network," notes Hazel.

Internetwork Topology

Amdahl and IBM mainframes
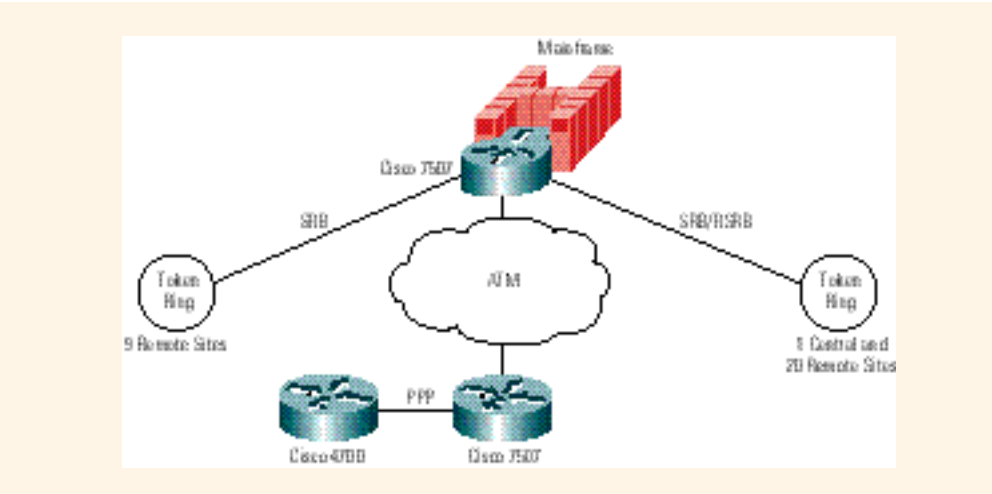IBM RS/6000 workstations
PCs

Cisco Systems Products

Cisco 7507 routers with CIPs
Cisco 4700 and 2500 routers
PIX Firewall

Protocols

SNA, SRB, TCP/IP, IPX

Network Interfaces

FDDI, ATM, Token Ring, Ethernet,
Serial (HDLC to Frame Relay)

BCBSSC has connected its remote sites to the main data center with Cisco routers and CIPs, providing a more scalable solution and faster, secure access to the CICS applications over the WAN.

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"Cisco had the best equipment, the greatest technical expertise, and the most complete solution for our large SNA environment."

Michael Antash
IS Administrator
City of Houston

Like most publicly funded entities, the City of Houston has a mix of new and old computer systems. But thanks to the assistance of Cisco Systems, the city is installing a modern network infrastructure that streamlines data processing and lays the foundation for a wide variety of improved public services.

"We put Cisco to the test to assist with the design and implementation of our local- and wide-area networks," says Michael Antash, an IS administrator for the city and director of its network upgrade project. "Cisco had the best equipment, the greatest technical expertise, and the most complete solution for our large SNA environment."

The City of Houston employs 23,000 people in 18 departments. For years, many of these departments have handled their own data processing operations, which has resulted in many different types of systems. "We have Amdahl, Unisys, and Bull/Honeywell mainframes, Hewlett-Packard servers, an IBM AS/400, and lots of legacy terminals and printers… a very diverse environment," says Antash. "Our challenge was to construct a network that would permit all these dissimilar systems to communicate."

Since 1985, the City of Houston has relied on an X.25-based network from AT&T called the Information Systems Network (ISN). It did the job, but it was slow: only 9600 bps. This speed wasn't adequate, particularly as many city departments began implementing high-bandwidth client/server systems.

In 1995, the city asked router vendors to bid on a new network that could support its voice and data requirements well into the 21st century. The city wanted to replace the X.25 network, integrate it with two existing fiber-optic networks, and create a cohesive WAN

that could support all of the city's diverse data processing operations and, eventually, its telephony needs as well. "We knew we wanted to construct a router-based network based on TCP/IP," says Antash. "We wanted to run LAN traffic along with various mainframe traffic, and we needed a more modern, scalable network."

The city considered proposals from several vendors, then set up a test bed in which prospective bidders could install and demonstrate their equipment. "Cisco really stepped up to the plate to win our business," Antash recalls.

The testing took place over an eight-month period. "It was an immense systems integration job to retrofit the old departmental networks on top of the new network," continues Antash. "Cisco had six or seven engineers on site helping us set up equipment, string cables, and write custom interfaces to establish connectivity to our legacy environment."

All of the city's financial application processing activities take place on an Amdahl mainframe system, necessitating fast and reliable connectivity between that system and the rest of the network. The city uses the Amdahl 4745 synchronous and 4655 asynchronous front-end processors (FEPs). Cisco recommended replacing these devices with a pair of Channel Interface Processors (CIPs), set up in a redundant configuration on two Cisco 7507 routers. The
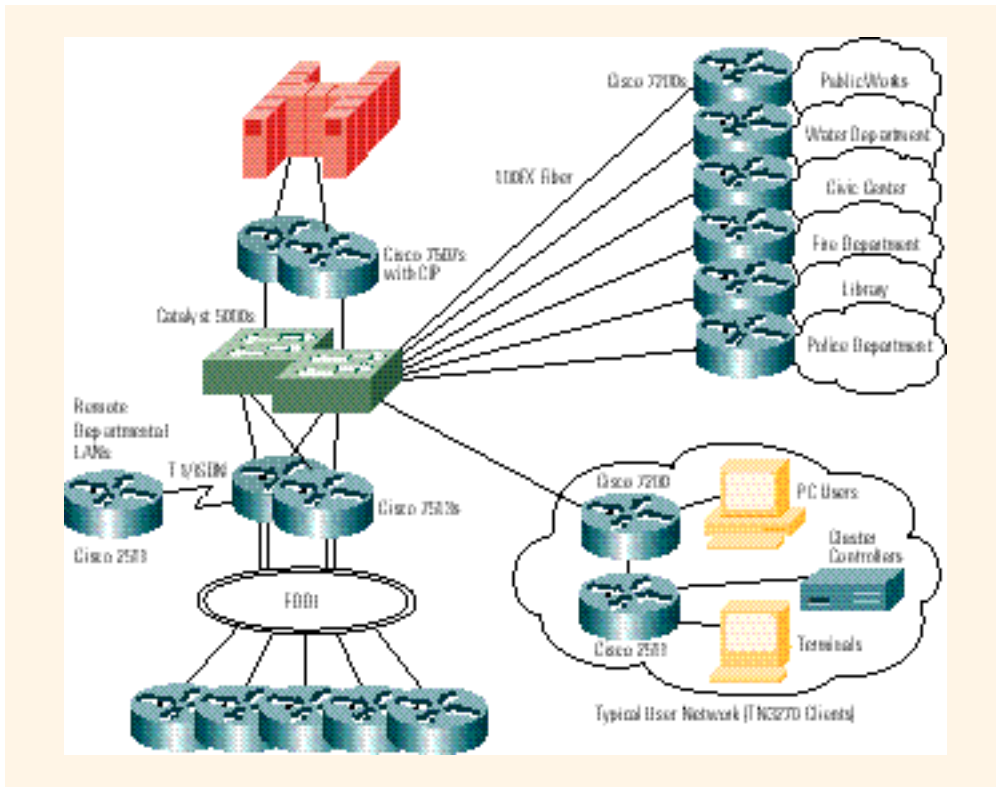
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CIPs run CSNA, Cisco IOS™ for S/390, and TN3270 Server.

"With so much processing taking place on this mainframe, fast and reliable connectivity is extremely important,"Antash says. "The CIP card dramatically improves the performance of network traffic and gives us the ability to support many types of network interfaces and protocols."

Cisco also established the design and specified devices for LANs in more than 50 locations, including Cisco 7200 and 2500 series routers in place of the legacy ISN packet switches. A pair of Catalyst® 5000 switches in the data center supports dedicated 100-Mbps Ethernet links to each department. "We used to have anywhere from 100 to 150 people per LAN segment, with low bandwidth," notes Antash. "Now, many locations have dedicated 10- and 100-Mbps links, which has improved bandwidth capacity by several orders of magnitude."

Antash and the city's network engineers have placed a lot of stock in the excellent support services they have received from Cisco's local office in Houston. "Cisco has nearly three times as many support personnel here as its nearest competitor," says Antash. "Police, fire, public safety—we're giving these groups the infrastructure they need to serve the public better and offer enhanced services. Cisco is giving us the backing we need to proceed with confidence."

Internetwork Topology

Amdahl, Unisys, and Bull/Honeywell mainframes
IBM AS/400 and Hewlett-Packard servers
NetWare and Windows NT servers
Windows PCs
3270 terminals

Cisco Systems Products

Cisco 7507 routers with CIPs
Cisco 7513, 7200, and 2500 series routers
Cisco AS5200 dial-in server
Cisco ISDN equipment
Catalyst 5000, 3000, and 1900 switches
CiscoWorks for Switched Internetworks
CiscoWorks for Windows

Protocols

TCP/IP, IPX/SPX, SNA

Network Interfaces

Ethernet (10BaseT, 100BaseT)
FDDI, ISDN, HDLC, PPP

Dual Cisco 7507 routers hosting Channel Interface Processors manage network traffic for 18 departments within the City of Houston.

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> "We wanted a company that not only had good routing technology, but that could help us establish a more efficient network infrastructure."
>
> *Vartan Yeghiazarian*
> *Network Systems Manager*
> *City of Inglewood*

As high-speed computer networks are established to link government entities to each other and to the public at large, many city governments find they are able to offer specialized services to other cities within a designated geographic region.

In California, for example, the City of Inglewood handles parking citation services for San Diego, Sacramento, Oakland, Berkeley, and a number of other cities, counties, and school districts. A statewide Frame Relay network, built around Cisco routers, enables high-speed access to parking violation data on the City of Inglewood's mainframe computer, an IBM ES/9000 system running VSE/ESA.

Until recently, an SNA-based point-to-point network connected these government customers to the City of Inglewood's mainframe through an IBM 3720 front-end processor (FEP). But as cities around California began to upgrade their 56-kbps connections to faster dedicated connections over Frame Relay, the FEP couldn't support all the new types of network traffic.

"We wanted to upgrade our SNA-based FEP to a multiprotocol router," says Vartan Yeghiazarian, Network Systems Manager for the City of Inglewood. "We needed a way to support constant, interactive connections to the mainframe via TCP/IP and IPX, along with the traditional mainframe protocols such as APPC and APPN."

Yeghiazarian and his colleagues considered solutions from several companies and decided to purchase a Cisco 7200 series router, later upgraded to a Cisco 7505 router with Channel Interface Processor (CIP). "All of the companies offered TCP/IP and IPX routing, but Cisco was the only one that could cost effectively satisfy our mainframe needs," he says.

Even more important to Yeghiazarian was the comprehensive knowledge and experience that Cisco brought to the table. "We wanted a company that not only had good routing technology, but that could help us establish a more efficient network infrastructure," he adds. "The Cisco account reps had all the answers, and its technical consultants had enormous knowledge and insights into our problems."

Today, the Cisco 7505 router with CIP card has become an integral component in a Frame Relay network that links dozens of cities throughout California. The CIP card simplifies access to mainframe data by connecting directly to the mainframe channel, eliminating the need for expensive intermediary equipment.

With the CIP, the city can also offer multiple protocols over Frame Relay, Ethernet, Token Ring, and other popular network interfaces. "Now we have lots of connectivity options," says Jim Nyman, MIS Director for the city. "We can continue to run our APPC applications here in Inglewood, but give our customers high-speed, interactive access to the mainframe host via many different protocols."

Cisco's assistance extended beyond setting up the router and CIP. Its consultants also helped the city get established on the Frame Relay network. Old 56-kbps point-to-point SNA lines were replaced by T1 lines: one for Internet access, one to support traffic related to a Job Training Partnership Act (JTPA) project, and two for Parking Ticket Services (PTS).

"We've had to resolve lots of issues with the phone company that we didn't face with the point-to-point lines," admits Yeghiazarian. "Cisco has often stepped in to assist. We've never run into a technical problem that the Cisco team couldn't solve."

Nyman concurs. "Implementing these new systems has resulted in better services for city governments throughout the state," he concludes. "Cisco provides outstanding products and the experience we need to put our new network services in place."

Internetwork Topology

- IBM ES/9000 mainframe
- IBM AS/400 midrange computers
- Hewlett-Packard midrange Windows NT servers
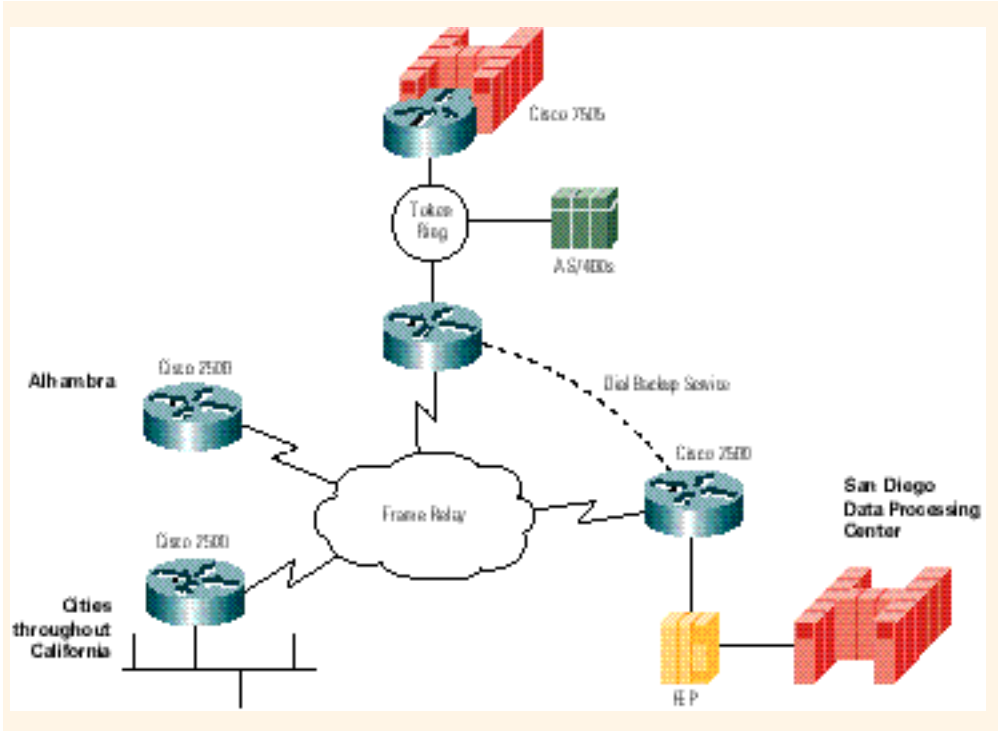- Windows NT and Windows 95 PCs

Cisco Systems Products

- Cisco 7505 router with CIPs
- Cisco 2500 routers

Protocols

- TCP/IP, IPX, APPC, APPN, SNA

Network Interfaces

- Frame Relay, Ethernet (10BaseT, 100BaseT), Token Ring, 56-kbps point-to-point

A Cisco 7505 router and CIP card helped the City of Inglewood establish a multiprotocol gateway between its ES/9000 mainframe and the statewide Frame Relay network.

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"Our [merging protocol] problem is resolved with the installation of Cisco routers."

The information department of Maritima Seguros S/A—an insurance company headquartered in São Paulo, Brazil—maintains a repository of insurance policies on car, fire, life, and other types of insurance.

Fabiano de Freitas
Network Analyst
Maritima

About 300 independent insurance agents and 1600 employees spread across 40 branch offices access Maritima's network daily for financial, administrative, and strategic data stored on its two IBM mainframes. To increase client satisfaction and retain its competitive edge, Maritima has undertaken an innovative and intensive technological restructuring of its network.

At the heart of this restructuring is a new WAN backbone to connect the remote offices via a corporate intranet. Cisco routers and switches comprise the fabric of the new network.

Before the Cisco upgrade, Maritima was faced with the problem of sharing information between offices and relaying insurance data to the independent agents. Its goal was to leverage its mainframe investment—delegating to the mainframes functions optimized by their central processing power—while improving the network's scalability, performance, and flexibility.

Maritima had two separate networks in its headquarters, one for Systems Network Architecture (SNA) traffic and the other for LAN traffic carrying primarily IP and IPX. Maritima needed to expand its office LANs. In addition, its IBM front-end processors (FEPs) and 3174 controllers were reaching capacity while the number of users that needed to access the mainframe was increasing. There was also a growing need for access from IP clients.

In 1995, the company bought several Cisco routers to provide remote access to the data center and to consolidate its SNA and LAN networks. In 1997, Maritima installed the Cisco 7513 router with the Channel Interface Processor (CIP). In addition to off-loading some processing tasks from the mainframes, the CIP is able to address the growing demand for connectivity while providing a simple means for TN3270 clients to access mainframe data transparently.

"Our [merging protocol] problem has been resolved with the installation of Cisco routers," says Fabiano de Freitas, Network Analyst for Maritima. The routers have also enabled Maritima to start the installation of its object-oriented client/server applications in its branch offices, using the same leased lines.

Maritima is developing applications to allow external users to find information using the Internet. The CIP's TN3270 Server feature allows these applications to access the mainframe and provide the information to any platform via Web browsers. Agents will be able to obtain information immediately rather than waiting for it to be sent by fax or mail.

To optimize network performance and availability, Maritima implemented Data-Link Switching Plus (DLSw+), which encapsulates SNA on a TCP/IP network. This technology enables consolidation of parallel networks to reduce costs. It also enhances availability by providing nondisruptive rerouting around network failures. Cisco's DLSw+ solution combined with the CIP for mainframe access improves network response time and, as a result, improves end-user productivity. "Access time to business information has been reduced by 45 percent after the network was upgraded with the Cisco routers, CIP, and DLSw+," de Freitas says.

Another benefit Maritima discovered with its network upgrade is that Cisco routers reduce the cost of network maintenance. "Installation was easy, and the CiscoWorks network management software enables us to see all devices in the network, making it possible to monitor and expand without costly delays," de Freitas adds.

Internetwork Topology

- IBM 9672 and 9121 mainframes
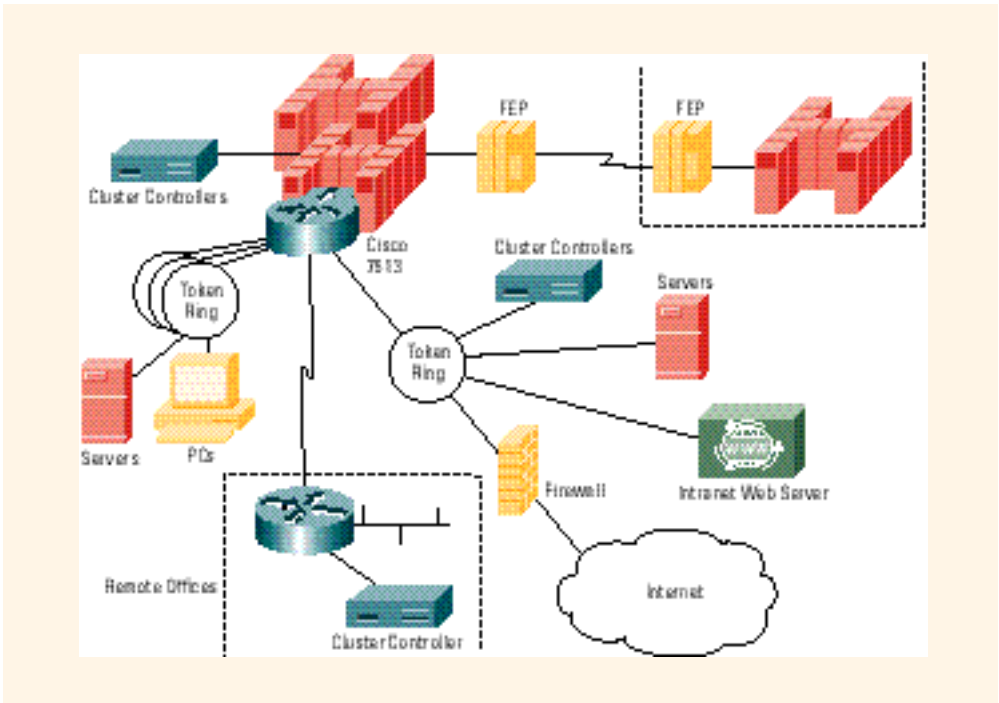- IBM RS/6000 workstations and servers
- PCs

Cisco Systems Products

- Cisco 7513 router with CIP
- Cisco 2507, 2501, and 1005 routers
- Catalyst® 1900 switches
- CiscoWorks

Protocols

- SNA, TCP/IP, IPX/SPX

Network Interfaces

- Token Ring, Ethernet 10BaseT

Maritima has restructured its network with Cisco equipment and software to leverage its mainframe investment while exploiting the business potential of the Internet.

"Cisco was chosen because of superior software functions in general, but especially for its ability to deal with system management and IBM legacy."

Didier Durand
Managing Director
MediaConnect
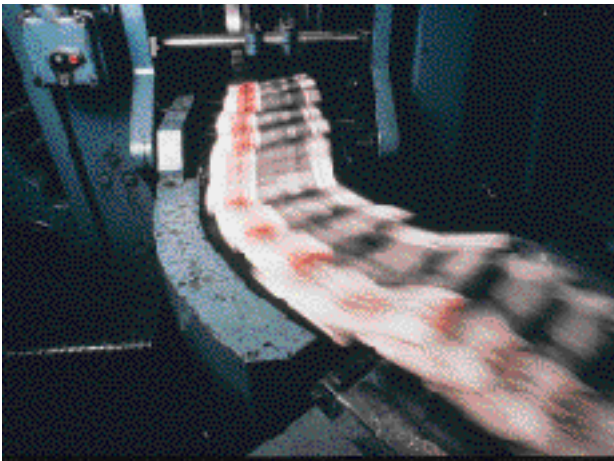
MediaConnect, based in Lausanne, Switzerland, is a joint venture between the advertising agency Publigroupe—which handles 65 percent of the Swiss market—and the Swiss Associated Press, Agence Télégraphique Suisse (ATS). MediaConnect provides and manages a global extranet for the Swiss newspaper community, where all publishing is run digitally.

The goal of this joint initiative is to provide the best infrastructure to make the business of the two companies more dynamic: through this multiservice network, newspapers get 100 percent of their content, both editorial and advertising.

The telecommunications challenge for advertising is volume: numerous huge files, such as four-color pages ready for print, are exchanged daily on the extranet. The challenge for the news business is availability and timeliness of information.

MediaConnect's existing network resulted from the merger of ATS's DECnet and Publigroupe's Systems Network Architecture (SNA) legacy networks, with the addition of IP to ease standard connections with newspapers. The original networks were proprietary, and the merger created an immediate need to accommodate disparate protocols. To solve this problem, MediaConnect purchased 300 multiprotocol routers from Cisco Systems and replaced its 12 front-end processors (FEPs) with two Channel Interface Processors (CIPs) as an easier means to reach legacy data stored on the mainframes. "The network had to be open and flexible, so multiprotocol routers were the only way to add that capability," explains Didier

Durand, Managing Director. "Now we have the ability to interconnect with our partners. In the past, we were living in different worlds. We could never interconnect at the network level."

In addition, MediaConnect implemented LAN switching and migrated its shared Token Ring network to Ethernet using the Catalyst® 5000 at headquarters and Catalyst 1900 switches in the branch offices. For remote users, dial access via Integrated Services Digital Network (ISDN) and asynchronous modems was accomplished with Cisco AS5200 access servers and Cisco 1600 series and 760 routers. A secure Internet connection with Cisco TACACS+ and CiscoWorks for network management rounded out the solution. "We wanted one integrated network," Durand says. "Cisco had a solution for all our networking needs."

Being able to share materials with its partners in the newspaper industry has been good for business at Publigroupe. Two-day delivery timeframes have been cut to two hours, so that time-sensitive ads, such as food specials, can run the same day they are placed. In addition, the time savings of computer-to-plate print technology—enabled by the Cisco multiprotocol network—is so dramatic that it allows MediaConnect and newspapers to compete with TV ads for the first time. "We can

make newspaper advertising as attractive as television," Durand says.

These technological improvements have made daily life easier for the MediaConnect staff. The FEPs required staff to make changes after hours and could not provide information on what was occurring in the network. However, the Cisco routers allow staff to make configuration changes on line with no impact on users, and they offer detailed reports of activity, including all the Management Information Base (MIB) information necessary for performance

reports. "Monitoring is much more accurate due to the whole set of tools available in Cisco IOS™ software," Durand comments.

The CIPs also manage TCP/IP connectivity to the mainframe and transport SNA data over an IP backbone using Data-Link Switching Plus (DLSw+). DLSw+ addresses network scalability issues by enabling the router to dynamically interconnect with other peer routers and making it easy for network administrators to add peers. "Cisco was chosen because of superior software functions in general, but especially for its

ability to deal with system management and IBM legacy," Durand says.

In 1998, MediaConnect will roll out a 155-Mbps Asynchronous Transfer Mode (ATM) backbone based on Cisco equipment, which will connect 20 major cities to support the industry's paradigm shift to a fully digital printing process. This level of power is required both to accommodate the new paradigm and to offer new services now made possible by the flexibility and functionality of this Cisco network.

Internetwork Topology

- IBM ES/9000-831
- IBM AS/400 Model 500s
- Sun Workstations
- OS/2, Windows 95 and NT PCs
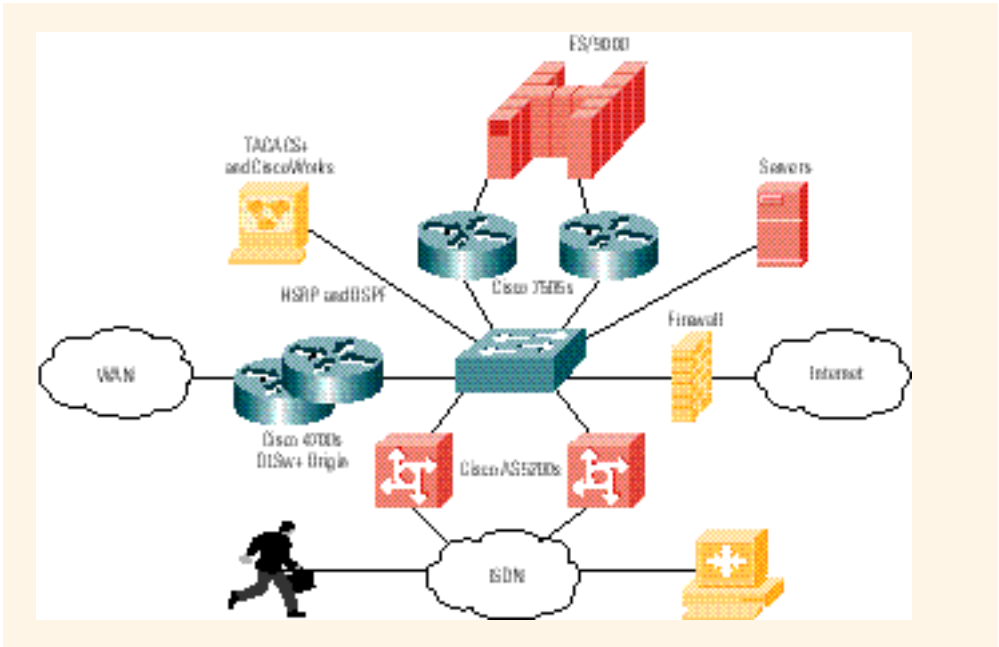- Macs

Cisco Systems Products

- Cisco 7010 routers with CIPs
- Cisco 4700-M, 4000-M, 2500, 1601, 1603, and 760 routers
- Catalyst 5000 and 1900 switches
- Cisco AS5200 access servers
- TACACS+
- CiscoWorks

Protocols

- TCP/IP, SNA, DECnet, AppleTalk, NetBIOS

Network Interfaces

- Leased Lines, X.25, Frame Relay, ISDN BRI and PRI, Token Ring, Ethernet, Fast Ethernet

MediaConnect revamped its network infrastructure with a full complement of Cisco products for improved performance and management at lower cost.

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Rijksdienst Jaarlijkse Vakantie/Office National des Vacances Annuelles (RJV/ONVA), a Belgium-based government agency, is responsible for paying workers' vacation salaries. For this purpose, the agency services and shares information with private subsidiaries, requiring access to data not only on its mainframe but also on other mainframes connected to that of the Kruispuntbank Sociale Zekerheid/Banque Carrefour Sécurité Sociale (KBSZ/BCSS).

For an organization that handles personnel records and accommodates external users, support for multiple protocols and fast response time for retrieving data is vital to its success. Cisco Systems' Channel Interface Processor (CIP) meets these key requirements. Plus, the CIP's versatility continues to keep costs down.

The Cisco solution seemed like destiny, according to Clément Noé, Technical Coordinator. Because RJV/ONVA is a government agency, it must put out an open call for bids on new technology. When the bids for this project were received, six of the seven responses were Cisco-based solutions. "It seemed obvious it would be Cisco products for our new network," Noé recalls.

RJV/ONVA chose Cisco in part due to its support of Data-Link Switching Plus (DLSw+), which allowed the company to consolidate its multiprotocol networks onto a single backbone. At the same time, the CIP enabled RJV/ONVA to achieve its goal of providing mainframe access to all users. "We had many LAN and WAN problems, and we were looking at ways to hook up and link the networks while providing access to the mainframes. The CIP solved all that," Noé says.

The link was originally provided by a Systems Network Architecture (SNA) network interconnection (SNI) between

RJV/ONVA's IBM 3720 front-end processor (FEP) and KBSZ/BCSS's 3745 FEP. The volume of data and the need to share and organize it demanded a new, modern network infrastructure. "We were running out of hardware," Noé explains.

The SNI connection was replaced by Advanced Peer-to-Peer Networking (APPN). Both entities, RJV/ONVA and KBSZ/BCSS, agreed to enable APPN in their mainframes. By using the border node feature of APPN in VTAM, they were able to connect the two networks with different NETIDs in a much more flexible configuration while providing higher performance. "We now have an integrated network with fast access to the mainframe," Noé says. "Our close collaboration with Cisco's system engineers helped us design an optimal solution."

In addition, the CIP has enabled RJV/ONVA to lower the cost of its network. By replacing SNI with APPN and running SNA over the CIP, the company has been able to eliminate the IBM 3720 FEP.

The CIP also provides scalability that will enable the network to expand with the company's new, increasingly modern approach as the demand for additional capacity dictates. The company plans to put the new power of its network to use with document imaging, digitizing all records that now exist on paper. "Lots of paperwork,"

comments Noé. "We're planning to put all documents on line and have an e-file cabinet to get rid of the paper in the office."

Eventually, RJV/ONVA also plans to offer Web browser access to that data. The Cisco-enhanced network infrastructure will provide a solid foundation and handle the new intranet and Internet communications with ease.

Clément Noé
Technical Coordinator

Internetwork Topology

IBM ES/9000 mainframe
Workstations
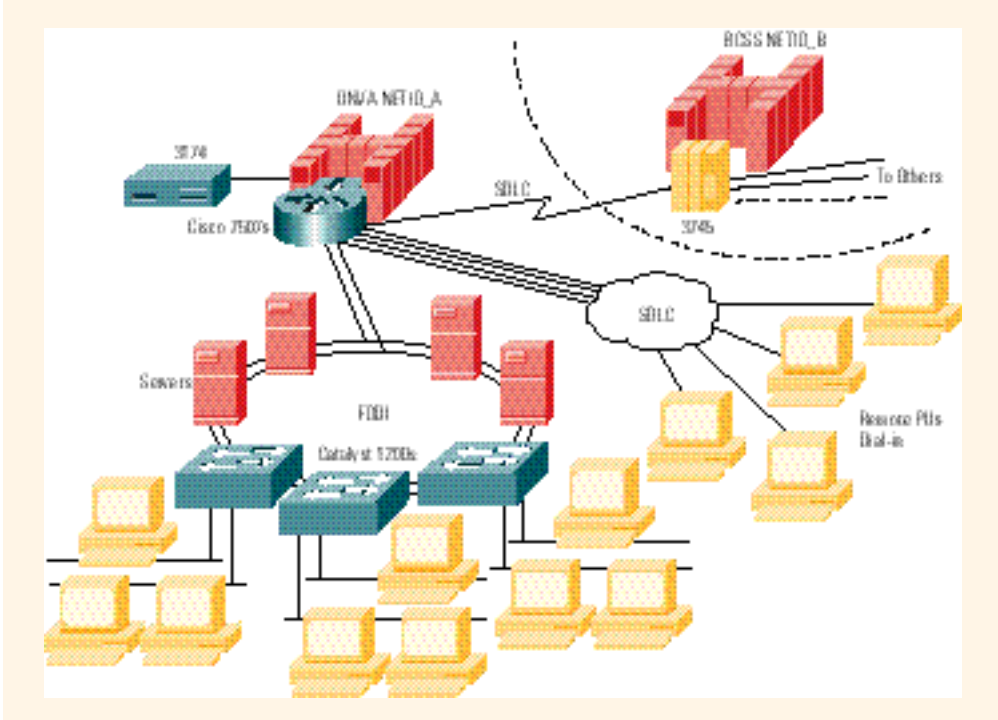PCs

Cisco Systems Products

Cisco 7507 router with CIP
Catalyst® 1200 switches

Protocols

SNA, APPN, TCP/IP

Network Interfaces

FDDI, SDLC, Ethernet

The Cisco router with CIP solution has enabled RJV/ONVA to replace its SNI connection with APPN and eliminate its FEP for a network that offers high performance at low cost.

Although it operates like a private enterprise, SERPRO is the Brazilian Government Data Processing Service, created in the 1960s to provide more IT flexibility. SERPRO is responsible for all IT services within the Ministry of Finance and the main information systems for the federal government.

Its flagship product, SIAFI (Financial and Administrative Information System), controls federal budget and public expenditures and is recommended by the International Monetary Fund and the World Bank as a sensible model for other countries to follow.

SERPRO's extensive national network now handles almost 50,000 users per day, which represent 35,000 devices in 600 offices across Brazil. All business data, such as government financial information, personnel management, and trades control operational information, is stored in six IBM mainframes in three data centers. To service its users, SERPRO has installed a new high-speed corporate backbone of StrataCom® switches and Cisco Systems routers and relies on Channel Interface Processors (CIPs) to allow its disparate workers to have multiprotocol access to data on the mainframes. The network currently contains 18 StrataCom IGX™ switches and three Cisco 7513 routers, each with two CIPs, as well as CiscoWorks network management software.

The Cisco network is part of a major network rejuvenation plan. The old network was based on an outdated 1974-era architecture, with character-based applications and only one online data center. To improve the network, SERPRO bought front-end processors (FEPs), which served its needs through the '80s. But as the high-tech '90s dawned, "the scenario started to change, and we faced a new reality," remembers Tacito Furtado, SERPRO's Network Division Chief. That reality included applications with graphical user interfaces, distributed computing, voice and data over the same infrastructure, videoconferencing applications, and more. The FEPs simply could not run these modern applications well and were "very expensive" to maintain.

SERPRO's main goals for its new network were to increase capacity to meet the increasing demand for distributed processing and client/server applications, minimize operational costs, and gain the flexibility to handle future growth. A key tactic was to consolidate network functions, which is cost-effective in a network so large.

"We had specialized networks for voice, data, SNA data transactions, IP data transactions, and so forth. Now, with Cisco routers and StrataCom IGX switches, we are consolidating all services over the same infrastructure, saving money and improving our network management," Furtado says. Another plus is the operational flexibility that Cisco provides. The network changes have been accomplished transparently, with no interruptions to users.

The new backbone provides better service with an immediate return on its investment—US$7 million annual savings in telephony costs alone. In addition, Cisco's CIP technology provides many advantages over the FEPs: it saves SERPRO overhead by improving Synchronous Data Link Control (SDLC) response time by 25 percent, it is easier to manage, and it is more cost-effective. "We process about 125 million transactions per month from the mainframe data centers, and we need a huge network throughput to have a good service level. Cisco's CIP is the key," Furtado notes.

SERPRO has committed to future Cisco-based expansions and is installing a "maximum security" intranet for private traffic. It is also enabling public access to some parts of the network for new services such as tax declaration over the Internet. SERPRO's first Internet trunk site, based on Cisco 12012 and 7513 routers, will provide a centralized gateway for government employees to access the Internet. Furtado says this project is an example of how Cisco products have successfully connected SERPRO's network to others. "This site is the first place to establish this integrated infrastructure," he says.

Internetwork Topology

IBM ES/9000-982 mainframes
HP, Sun, and DEC workstations
PCs

Cisco Systems Products

Cisco 7513 routers with CIPs
Cisco 12012 routers
StrataCom IGX switches
CiscoWorks

Protocols

SNA, TCP/IP, IPX/SPX

Network Interfaces

ATM, X.25, Bisynch, Frame Relay, SMDS, HDLC
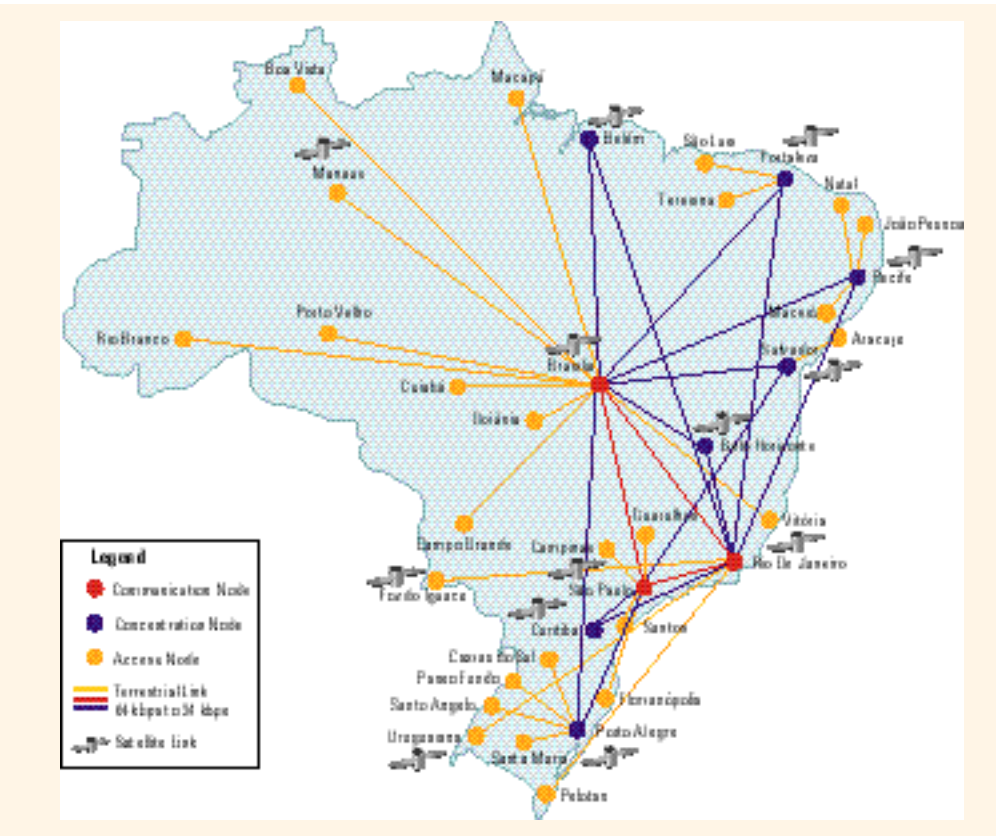
SERPRO's new three-tiered network infrastructure provides high-speed, multiprotocol data access with nearly 100 percent availability.

17

"The Cisco routers and the CIPs provide us with

S GIO Insurance Limited, founded in 1926, has become not only Western Australia's largest general insurer but a national company that offers a wide range of insurance products and services, including motor, home, health, and commercial insurance.

flexibility for growth, so we can accomplish our future business goals."

Peter Dimitrijevic
Group Manager of Communications and Desktop Systems
SGIO

As part of the company's strategic expansion, in 1995 SGIO acquired the health and general insurance operations of the South Australian State Government Insurance Commission (SGIC). Since then, underwriting offices have been opened in New South Wales and Victoria.

To date, SGIO employs almost 1000 staff and provides insurance services to approximately 500,000 customers. To service all these customers, employees need appropriate technology to perform day-to-day coordination of underwriting and claims management operations.

As part of integrating the two companies, their data centers were consolidated in Adelaide. Because systems programming, support, and application development functions were still being performed from Perth, a high-bandwidth connection was needed between Perth and Adelaide and out to the regional branches in each state. In addition to providing scalability and high throughput, the new infrastructure had to accommodate traditional Systems Network Architecture (SNA) as well as the newer intranet technolo-

gies. The existing IBM front-end processor (FEP) could not easily accommodate the expansion or provide the required functionality.

Cisco products provided the answer to each of SGIO's network requirements. "From our review, the Cisco router with CIP offered the most cost-effective solution while providing the benefits of improved performance and functionality," says Peter Dimitrijevic, Group Manager of Communications and Desktop Systems.

To centralize information across its 15 sites, SGIO installed two Cisco 7507 routers, one with a Channel Interface Processor (CIP) that provides connectivity to its mainframe in Adelaide. A second CIP and Cisco 7505 router with Integrated Services Digital Network (ISDN) services was stationed at a disaster recovery site to provide links into a backup mainframe. "Rather than have multiple data centers, we decided to centralize and channel our traffic through the CIP," Dimitrijevic says. Currently the CIPs are primarily transporting SNA into the mainframes. However, SGIO is planning to provide TCP/IP access to the mainframe, and the CIP's TN3270 Server and other features will position the company for that move.

The two CIPs save the company money by enabling a multiprotocol network. Data-Link Switching Plus (DLSw+) transports SNA traffic over a TCP/IP network, providing nondisruptive services to the SNA clients in the remote branches. "Our previous network environment consisted of two separate networks—one SNA, the other TCP/IP. Using DLSw+ has allowed us to consolidate the two previous networks to one based on TCP/IP.

Moving to one network protocol has also allowed the consolidation of network management platforms and tools," he explains. Consolidating traffic onto a TCP/IP backbone also positions SGIO for its next step: allowing TCP/IP clients native access to mainframe applications.

According to Dimitrijevic, the most substantial business benefit of the new Cisco network is the ability to grow. "The Cisco

routers and the CIPs provide us with flexibility for growth, so we can accomplish our future business goals," he says. "The Cisco router and CIP solution also provides network routing and front-end processing on one device, with the capability to accommodate future network and SNA technologies."

SGIO is planning to add more Cisco routers this year and is currently evaluating other Cisco product offerings.

Internetwork Topology

- IBM CMOS mainframes
- Memorex Telex 1174 controllers
- PCs

Cisco Systems Products

- Cisco 7500 series routers with CIPs
- Cisco 2507 routers
- CiscoWorks

Protocols
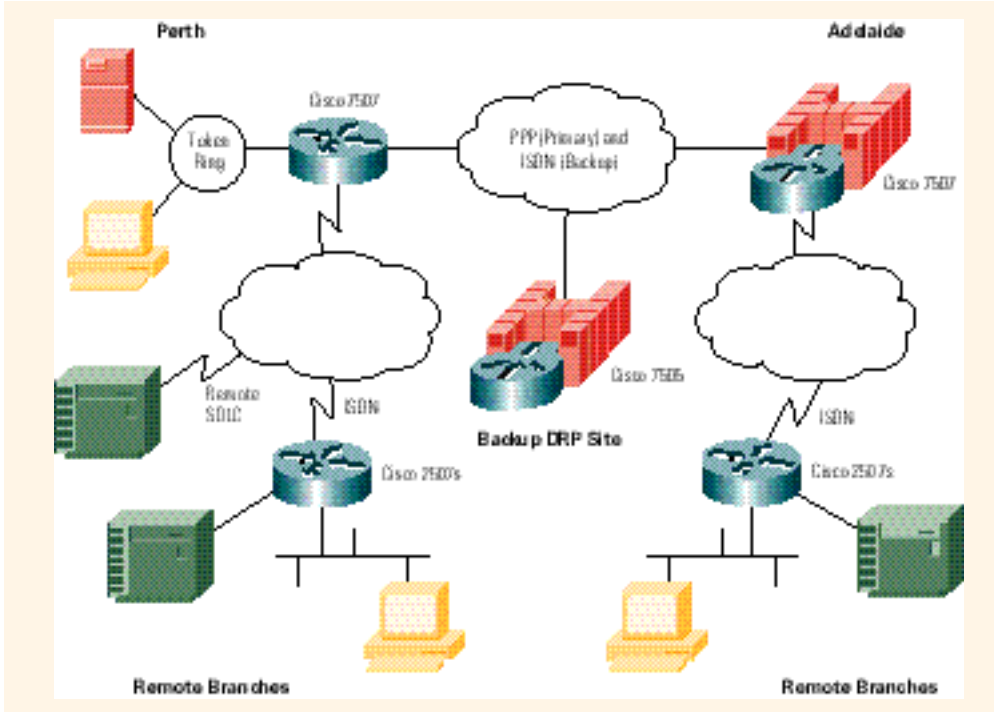
- SNA
- TCP/IP
- DLSw+

Network Interfaces

- ISDN
- Token Ring
- Ethernet
- SDLC

Cisco routers and CIPs enabled SGIO to consolidate data centers and establish a single multiprotocol network that provides the scalability, high throughput, and flexibility to meet current and future needs.

"The Cisco products dramatically simplify the network and reduce points of failure."

Lane Hensley
Manager of Distributed Systems Integration
Trans Union
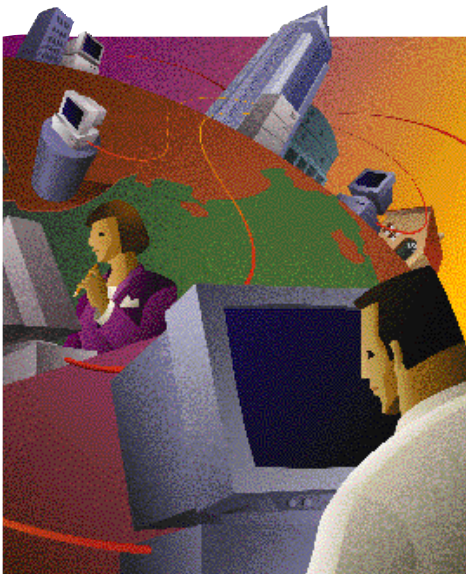
Trans Union Corporation is one of the nation's three largest credit reporting companies, providing credit-related products and services about consumers and businesses. Although credit reporting companies began as local enterprises, the increasing capabilities of network computing fueled mergers in the '80s, creating large conglomerates.

As computing capacities grew, companies with national capabilities came to the forefront of the industry. Now almost all credit reporting companies are affiliated with one of the "Big Three."

Due to this consolidation, the credit report market has become defined specifically by service, availability, and pricing. "The quality of integration and problem resolution support, as well as the responsiveness and helpfulness of the support staffs, distinguish the bureaus from each other," says Lane Hensley, Manager of Distributed Systems Integration.

To ensure that its customers receive the best support and information services at the lowest cost, Trans Union recently upgraded its system with Cisco Systems products. As the company shopped for new network solutions that would offer an infrastructure on which to build, a few key requirements surfaced.

First, credit information is usually transferred from credit grantors to the main Trans Union offices in Chicago, where it is funneled to any of 138 bureaus that sell the reports. To service its branch bureaus and their affiliates, Trans Union needed to support TCP/IP applications and high-speed file transfer from remote UNIX servers to the Systems Network Architecture (SNA) mainframe while providing increased network availability.

Before the network upgrade, all the bureaus were connected to headquarters through point-to-point leased lines, mostly running small analog circuits. The increasing limitations of this mode of data communication could not be ignored. "It was slow and SNA only," Hensley says. Some bureaus have PCs on LANs but could not reach the corporate e-mail system.

To organize and strengthen the network, Trans Union implemented a Frame Relay network with Cisco 7000 and 2500 series routers connected via T1 lines. "Now we have the ability to roll out new client/server applications such as human resources, billing, and office automation—all on the same network," Hensley says. "The Cisco products dramatically simplify the network and reduce points of failure."

The principal need to reduce downtime is fulfilled through dual Channel Interface Processors (CIPs), because they are reliable and provide redundancy. "We now have the ability to reroute through a second CIP, which is a big advantage. We can recover the connection without down time," Hensley says.

As its network continues to grow, Trans Union will become a 24 x 7 business. Currently, it closes for only about two and a half hours a night, but Hensley says being down for any reason, any time, should be avoided. For example, some of Trans Union's customers use an automated dialup system to dial into the network for credit reports. "For some customers, if we are down for ten minutes, we are down for the rest of the day. It's not like a human being is making

the decision; we have tripped an automated fault detection in someone else's system," Hensley explains.

The versatility and scalability of the CIP helped Trans Union in making its purchase decision. "We run TCP/IP on the mainframe and were looking for a way to off-load some MIP processing," explains Hensley. "The CIP lets us do that." Eventually, when Trans Union expands to 2000 concurrent TN3270 users, Trans Union plans to off-load all the

mainframe Telnet processing by running TN3270 Server on the CIP.

"We need the capacity to grow cost effectively," Hensley concludes. For this reason, Trans Union also plans to link the company's mainframes using Parallel Sysplex, a data center design that improves availability by distributed processing. Because Cisco's CIP technology supports Parallel Sysplex, Trans Union will be positioned to take this step when ready.

Internetwork Topology

IBM ES/9000 mainframes
IBM RS/6000 and HP 9000 servers
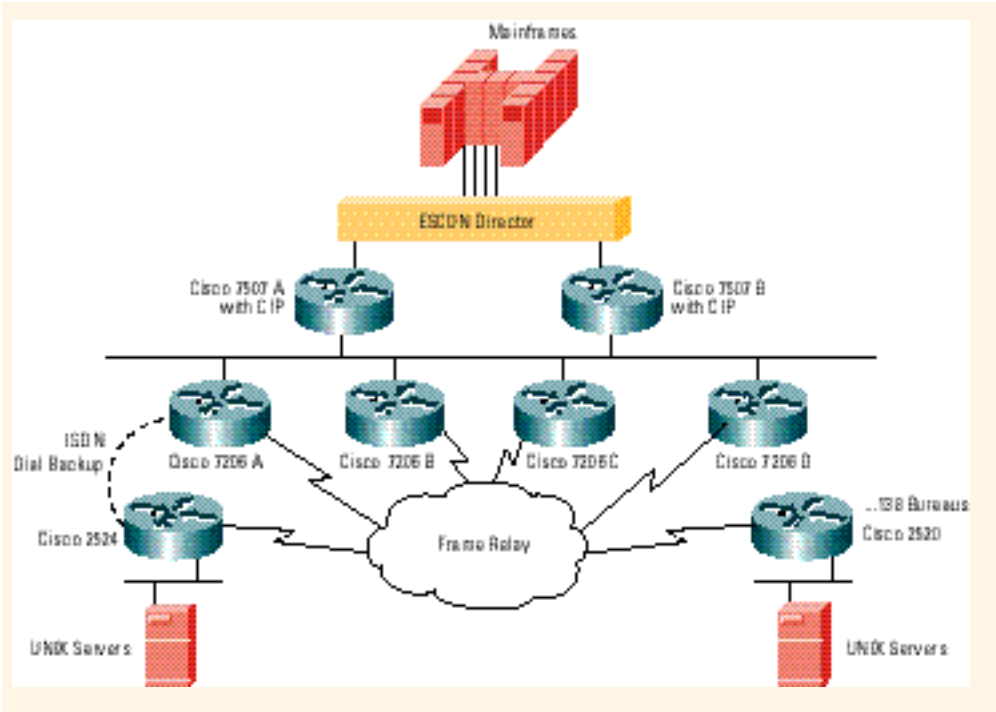Windows NT and 3.1 PCs

Cisco Systems Products

Cisco 7507 routers with CIPs
Cisco 7206, 2501, 2520, and 2524 routers
CiscoWorks
PIX™ Firewall

Protocols

TCP/IP, SNA, IPX

Network Interfaces

Frame Relay, ISDN, Ethernet,
Token Ring, ESCON

Trans Union's new CIP-enabled network provides redundancy for high-speed

file transfers from remote UNIX servers to the mainframes.

"Our network group determined that Cisco had the best internetworking technology on the market."

Brian McKenzie
IT Engineer
Wake County Government

Most organizations are eager for the opportunities and benefits that technical innovation brings, but they fear the consequences of complex automation efforts gone awry. Thus when Wake County Government launched a major initiative to upgrade its local- and wide-area network, they turned to Cisco Systems for the equipment and expertise necessary to complete the job.

"Cisco played a major role in getting us where we are today," says Brian McKenzie, an IT engineer at Wake County, NC. "Its technology is outstanding and its support engineers helped ensure a smooth implementation."

McKenzie and the network team are responsible for all of Wake County's networking activities. The Wake County Sheriff's office, Revenue office, and Human Services department are all on the network, along with the county's Library information systems. These and other county departments are connected via a local- and wide-area network to an IBM System 390 Multiprise 2000 mainframe computer running the VM/VSE operating system via the Cisco Channel Interface Processor (CIP) using the TCP/IP protocol.

Until recently, most county departments depended on Banyan VINES LANs running the Banyan VIP protocol for network services. Attachmate IRMALAN for VINES gateways were used for networked PC-to-mainframe connectivity. "The gateways acted like IBM 3174 controllers, sending SNA traffic to the mainframe," McKenzie explains. "We wanted to eliminate the VINES protocol altogether and standardize our entire network on TCP/IP. We also needed faster speeds and higher bandwidth to support graphic-intensive applications, such as our Geographic Information Systems and Mobile Video application."

McKenzie and colleague Bryan Stewart decided a router-based network would supply the speed and flexibility they needed while paving the way for TCP/IP access to the mainframe. "Our network group determined that Cisco had the best internetworking technology on the market," McKenzie says. "Cisco's routers would easily support the bandwidth we needed, and its Channel Interface Processor would permit an ESCON channel connection into the mainframe."

With help from Cisco, Wake County installed two Cisco 7507 routers in the network core. One router was designated as host for the CIP card, replacing an IBM 3745 front-end processor (FEP) Token Ring network connection. The team then installed a combination of Cisco 4500 and Cisco 2500 series routers at the edge of each remote network.

Thus WakeNet was born, a router-based wide-area network that connects all of Wake County's townships and municipalities to the county's main network. WakeNet uses fiber-optic cabling to connect major buildings via native-mode LAN interface (NMLI), along with Token Ring and Ethernet protocols over leased lines.

"Replacing the PC gateways with the CIP card gave us the ability to support plenty of Telnet sessions to our mainframe from all our sites," says McKenzie. "It also established more-reliable connections to the mainframe. The CIP was easy to install and implement.

Cisco helped with system design and configuration issues, and our internal network engineers did the rest."

Whereas data entry clerks used to type at speeds faster than the network could handle—causing their 3270 sessions to hang up—now they can type as fast as they want to and the mainframe will respond in kind. The typical load is 2000 concurrent sessions, which is well within the CIP's capabilities.

"Performance has improved tremendously through the CIP card," McKenzie says.

The benefits of the new router-based network include reduced system overhead, reduced operational costs, and a cohesive infrastructure that simplifies maintenance. "Our network devices all run Cisco IOS™ and CiscoWorks management software," says McKenzie. "This allows us to leverage a common set of skills across the enterprise."

McKenzie and his team are currently experimenting with a variety of Catalyst® switches within select LAN segments. "We're moving to switched 100-Mbps Ethernet to provide fast, dedicated access to key departments and applications," he concludes. "Our task moving forward is to position ourselves for the future with a network that gives us room to grow and expand well into the next century."

Internetwork Topology

- IBM S/390 mainframe
- IBM AS/400
- IBM RS/6000 server
- Banyan StreetTalk for NT servers
- PCs

Cisco Systems Products

- Cisco 7507 routers, one with CIP
- Cisco 2500 and 4500 routers
- Catalyst 5000, 2900, and 1900 switches
- CiscoWorks for Switched Internetworks

Protocols

- TCP/IP, SNA, Banyan VINES

Network Interfaces

- Token Ring, Ethernet (10BaseT, 100BaseT)

A Cisco 7507 router with CIP speeds access to mainframe resources for 2000 users in 50 locations.

"When we upgraded our network, we insisted on the same quality and reliability that we were accustomed to in the data center. That's why we chose Cisco equipment."

Rocky Tutor
Director of Technical Services
Wake County Public Schools

Until recently, the prevailing opinion was that mainframe technology would be eclipsed by microprocessors and the rise of PCs. Today, plenty of organizations are proving otherwise—including Wake County Public Schools.

"We depend on the reliability of our mainframe systems and our data center applications," says Rocky Tutor, Director of Technical Services at Wake County Public Schools in Raleigh, North Carolina. "When we upgraded our network, we insisted on the same quality and reliability that we were accustomed to in the data center. That's why we chose Cisco equipment." Wake County Public Schools is the second-largest public school system in North Carolina, with 110 schools. For years, the district has relied heavily on an IBM mainframe for its core data processing activities. Limited departmental access to mainframe applications and data was handled by a Memorex Telex 1174 communications controller. This front-end device served as the primary access point for the district's Novell clients using an SAA gateway. IBM 3174 controllers at the central office hosted remote controllers at each school via SDLC multidrop lines.

Today, most of the 110 schools have Cisco routers connected to the 3174 controllers, and Wake County Public Schools is well on its way to constructing a modern network that supports both traditional Systems Network Architecture (SNA) and TCP/IP for all schools. At the core of the network, the controller was replaced with a Cisco 7505 router and Channel Interface Processor (CIP), supplying fast, reliable access to mainframe resources. Cisco's Downstream Physical Unit (DSPU) feature was enabled on the CIP to handle the gateway functions of the controllers, while Data-Link Switching Plus (DLSw+) handles SNA traffic from the remote schools.

The CIP improved capacity and performance for SNA sessions and nightly batch data transfers. But, more importantly, it paved the way for a new network built around TCP/IP. "My charter is to take IP to the next level," says Tutor. "We want to run client/server applications right alongside our SNA traffic. The CIP and router combination is giving us this flexibility."

After extensive research, Tutor recommended that the district install Interlink's IP stack on the mainframe and operate the CIP in IP datagram mode. The district also implemented a cohesive, end-to-end network built around Cisco switches and routers. Within each school, local-area networks were constructed around Cisco 2500 series routers. These LANs support local applications via the IP, IPX, and DLSw+ protocols.

All schools are connected to a Switched Multimegabit Data Service (SMDS) cloud. The cloud interfaces with a pair of Cisco 4700 routers and a variety of Catalyst® switches, which use Fast Ethernet

to connect with the channel-attached 7505 router. The router interfaces with the mainframe via an ESCON channel. "We have 110 remote sites running off three separate SMDS clouds," says Tutor. "We are in the process of moving most of our multidrop lines onto Cisco routers. This eliminates the multidrop lines, some of the circuits, and many of the controllers, which is a more economical arrangement."

The district is currently running native SNA with DLSw+ out to each school. Looking ahead to thinner clients, they have enabled TN3270 Server on the CIP as well.

Tutor is accustomed to the data center environment, where 99.7 percent uptime and rock-solid reliability are taken for granted. "I feel we get that same level of reliability from the Cisco equipment," he says. "We've created a cohesive, end-to-end infrastructure from the core out to all the schools. It's an ideal environment."

The new network infrastructure has reduced monthly costs for the leased lines, delivered higher performance, and created a variety of ways to attach to the mainframe: TN3270, native SNA, and IP.

"Previously, we were very limited in our options for mainframe connectivity," Tutor concludes. "Now, we have a great deal of flexibility for rolling out new applications. Cisco gives us an outstanding set of options—and reliability we can count on."

Internetwork Topology

IBM ES/9672-RA4 mainframe
PCs
IBM 3270 terminals

Cisco Systems Products

Cisco 7505 router with CIP
Cisco 7507 router
Cisco 4700 routers
Cisco 2500 series routers
Catalyst 5500, 5000, 3200, and 1900 switches
Cisco IOS™ for S/390
CiscoWorks for Switched Internetworks

Protocols

TCP/IP, SNA, IPX

Network Interfaces

Token Ring, Ethernet (10BaseT, 100BaseT), SMDS
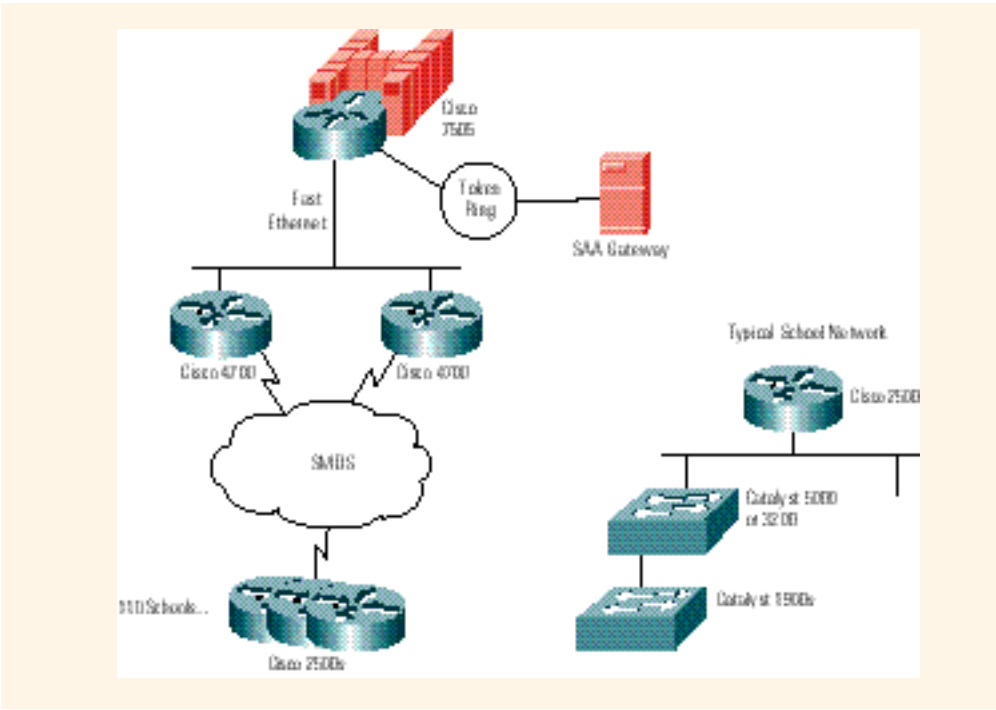
A channel-attached Cisco 7505 router with CIP card provides fast, multiprotocol mainframe access for 110 schools in the Wake County Public Schools system.

25

WellPoint Health Networks Inc.—one of the nation's largest publicly traded managed-care companies—maintains a large computer network connecting up to 10,000 employees in various business units. In a competitive business environment where providing fast, quality customer service is key, reliable access to the network is vital to success and growth.

Recent growth through acquisitions and national expansion created the need to consolidate networks with minimal disruption, according to Telecommunications Manager Wayne Baker. At the same time, WellPoint had a unique need to enable access to its host systems for hospitals requiring the ability to electronically submit claims and obtain eligibility information. As a result, WellPoint needed a flexible network infrastructure that would support multiple protocols and provide streamlined mainframe access.

Merging the networks also meant hooking up the hosts to remote data centers. "But we only wanted to manage one router network," notes Baker, who called on Cisco Systems for an end-to-end solution. Implementing a single-vendor solution simplifies the management and support of the network.

WellPoint already knew about Cisco routers. About two-and-a-half years ago, the company upgraded its network infrastructure with Cisco 4700 and 2500 series routers. When WellPoint began to expand outside of California, the company purchased Cisco 7513 routers for their additional expansion and performance capabilities. Now, faced with multiple merging networks, Baker needed an even more scalable solution that would allow him to link up data centers. He turned to Cisco for an answer that would leverage the investment of the routers and started by adding Channel Interface Processors (CIPs) for direct access to mainframe data and applications over the routed network.

"The CIPs were much quicker and easier to implement than the other solutions we evaluated," Baker says. "That was an important consideration, because we had 8000 to 9000 LAN-attached devices to connect."

Since implementing the Cisco upgrades, configuration changes have become smoother and simpler. The CIP provides access to mainframes for thousands of workers without requiring multiple gateways. "It eliminates the need to build a gateway whenever a new group is added to the network," Baker notes.

The network still has 5000 PC users on old gateways who need to access the mainframe. Baker plans to accommodate these users by running additional sessions of TN3270 over the CIP. "As we migrate the desktops from Windows 3.1 to NT/95, we will convert them to TN3270 clients to provide transparent access to those applications," Baker says.

WellPoint has also implemented Data-Link Switching Plus (DLSw+) as another way of leveraging its existing equipment while streamlining and enhancing communications over the network. Systems Network Architecture (SNA) clients can remain attached to IBM 3174 controllers and connect to the network via serial ports on the router. DLSw+ then enables WellPoint to manage users' needs for bandwidth by assigning priorities for different kinds of traffic.

Baker adds that flexibility is the key business benefit provided by Cisco's solution—an important feature in a network that is always changing. "The Cisco IOS™ router operating system has provided flexibility for our various network configurations," Baker says. This year, WellPoint will continue to add Cisco products and is currently implementing CiscoWorks for network management.

Internetwork Topology

IBM S/390
Hitachi HDS8824
Hitachi HDS Pilot 55
HP UNIX servers
7000 PCs

Cisco Systems Products

Cisco 7513 routers with CIPs
LightStream® 1010 switches
Cisco 4700, 2500, and 1600 routers
CiscoWorks

Protocols

TCP/IP, IPX, SRB, DLSw+

Network Interfaces

**Point-to-Point, Frame Relay,
Token Ring, Ethernet (10BaseT and
100BaseT), ATM OC-3C**
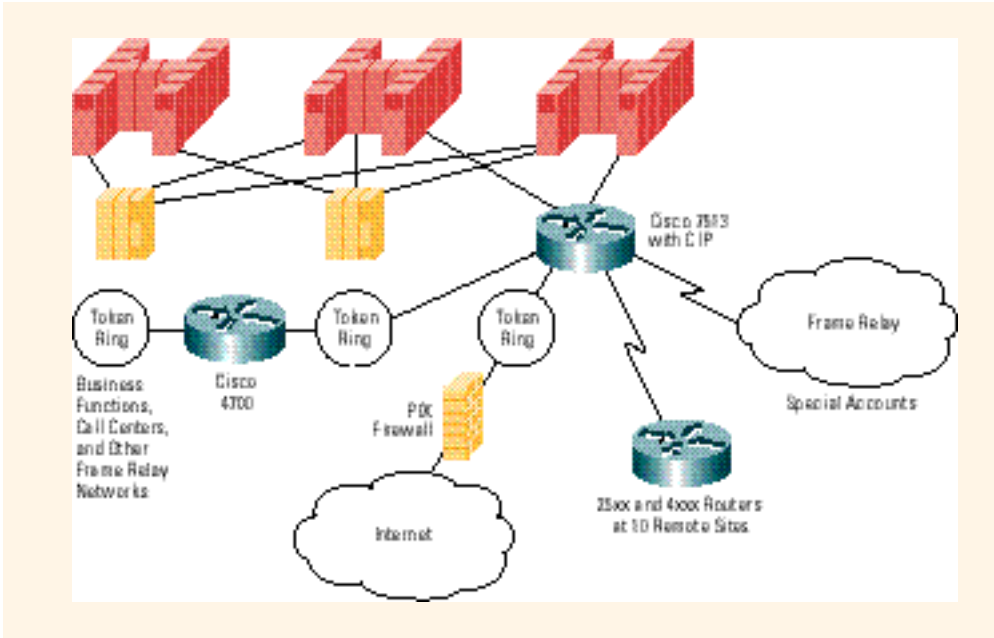
Using Cisco CIP technology, WellPoint has created a flexible network infrastructure that streamlines mainframe access with support for multiple protocols and the elimination of gateways.

27

Cisco offers proven IBM inter-networking solutions—solutions that run in the largest SNA and IP production networks in the world.

These organizations have used Cisco's IBM internetworking solutions to enhance availability, provide universal access to mainframe data, simplify management, and improve performance.

By consolidating multiple types of traffic onto a single backbone, they have also reduced cost and increased efficiency. Cisco's customers enjoy higher network availability, higher throughput, and faster network response time. And these are only the immediate benefits.

Cisco solutions have also addressed the future needs of these organizations. With a Cisco infrastructure in place, these customers are well positioned to roll out new applications, offer new Internet or intranet services, take advantage of lower-cost or higher-bandwidth carrier services, and scale their networks to address higher-bandwidth applications and thousands of new users.

But perhaps the most important reason for choosing Cisco is because Cisco offers proven IBM internetworking solutions—solutions that run in the largest SNA and IP production networks in the world.

Cisco Systems