E-commerce is coming to the world's first high-capacity fiber-optic global network, linking 100 cities throughout Europe. The network, being built by Global Crossing using Lucent's WaveStar™ OLS 400G system and WaveStar BandWidth Manager, will help cheese-maker Henri Willig of Edam, Netherlands, reach customers around the world through his Web site.



Lucent's 7R/E™ Packet Solutions portfolio allows service provider customers worldwide to deliver over packet networks virtually every service and feature available on today's public network. Left, Lucent engineers Hector Iurcovich (foreground), Ana Torres and Cyrus Pourooshasb test the 7R/E equipment in the lab.



Unleashing the Power of Networks

The key network building blocks are optical and packet technology and software. Lucent is leading the way in integrating these technologies to deliver next-generation networks.

Today's internet brings people a wealth of information, commerce and entertainment. The Internet of tomorrow will offer all this, and more. It will be all-pervasive, as much a part of our lives as the telephone and television.

But getting to that point won't be easy. The challenge is to bring together the many networks of today — wired, wireless, local, long distance and international. As the leader in broadband networking, Lucent today has the technology and talent to transform today's Internet into something even better: a new kind of network that is available anywhere, that carries voice as well as DVD-quality video and audio, that is reliable and secure, and that is affordable to many millions worldwide.

Packet, Optical, Software

One key is packet switching — a technology that shunts bits of digitized voice, data or video across a network. Now, the true power of broadband networking is emerging as Lucent integrates it with optical technology, which will deliver almost unlimited bandwidth. It will open the door to the applications of tomorrow, and let people communicate without limit.

Software is another key. Software confers network intelligence to support communications services over the different networks that will be part of tomorrow's broadband communications. Software will unify optical networks, packet networks like the Internet, and networks using a super-fast switching technology called Asynchronous Transfer Mode, into a single network of networks.

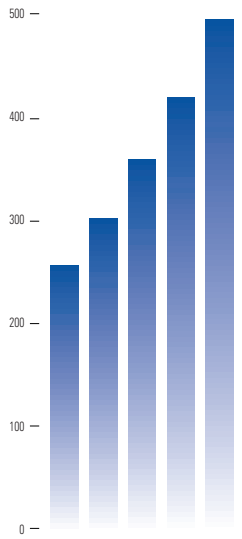
No company is better able than Lucent to integrate these technologies. During 1999, we solidified our leadership in broadband networking. We acquired new businesses. We added 7,000 people from those acquisitions to our broadband thrust. We rolled out dozens of broadband products, including PacketStar™ and Stinger™ DSL Access Concentrators.

Our merger with Ascend has given us the broadest and deepest solutions to help service providers offer broadband services and provide applications. Contracts we signed in 1999 demonstrate the potential of Lucent and Ascend worldwide. These include contracts with major companies like Telstra of Australia, Telefonica of Spain and Bell Atlantic. In fact, 27 of the world's 30 largest global service providers use Lucent and Ascend switching equipment in their data networks. Clearly, Lucent leads in next-generation networking for the service provider market. A synergy of the Ascend merger is the marriage of switching and optical technology in the core of networks to move voice, data and video around the world.

A case in point is Telefonica Data, a division of Telefonica Group, a carrier with some 50 million customers throughout Spain, Chile, Argentina, Peru and Brazil. Telefonica Data awarded us a $200 million contract to build a global network of packet-based technology called Internet protocol (IP). The agreement includes Ascend products, notably the MAX™ TNT™ wide area networking access switch. Also included is our Softswitch, a next-generation centerpiece that gives standard computer hardware the

Service Provider Networking Market

(dollars in billions)



The global service provider networking market is growing 18 percent annually (based on industry sources).



"My best friend moved to Brazil. Now we trade videos of each other and cool music, too." Megan Ng, 9



Lucent Tunes in Cable TV

Lucent entered a new market in 1999 — the cable TV market — with a product portfolio that includes our breakthrough PathStar™ Access Server. Comcast, a leading cable company that views services based on Internet protocol technology as a key to its broadband future, is trialing the PathStar system.

Part of Lucent's CableConnect™ Solutions portfolio, PathStar helps transform a cable operator from a video supplier to a full-service supplier of video, high-speed data and telephony.

Working with Lucent, Comcast can deliver high-speed Internet connections and telephone calls over its existing network, including conventional voice communications that people expect, such as three-way calls, call waiting and caller ID.

A big market for Lucent, cable TV operators in the United States are expected to spend $18 billion over the next five years to upgrade their networks for broadband services —according to market research firm Paul Kagan & Associates.



E-business is a growing channel for Lucent products. Illinois-based Anixter Inc. relies on the iBuy Lucent Web site for speedy product information and ordering.



Telefonica is bringing voice and Internet access to 15 countries in the Americas and Europe. Lucent, as the carrier's strategic supplier, is helping build the new network. The network will help members of SOS Orquideas, a group that preserves orchids in the wild, exchange information worldwide. Here, a member of the group conducts pollination studies on the flowers near Sao Paulo, Brazil.

power to connect any service — and to rapidly program new services.

Other carriers staking plans for revolutionary next-generation networks know that customers demand innovative broadband services. They also know that the first service most people want is to talk. The PathStar access server enables these customers to carry not only data and video services but also feature-rich voice.

Revolutionary Networking Is Evolutionary for Some

For established network providers, a transition to next-generation broadband networks means complementing the value of a voice-technology base like the Lucent 5ESS digital central office. Lucent's 7R/E Packet Solutions portfolio does this. It puts voice on packets, yet captures everything voice networks do best, including delivery of any of 3,000 networking and calling features. Our 7R/E Packet Driver helps 5ESS switch customers evolve to packet networks while reusing up to 80 percent of existing hardware.



Lucent's merger with Ascend has made us a leader in wide area network switching technology. Ascend customer PSINet, an Internet super carrier, uses Ascend's MAX remote access servers to give customers speedier access to the Internet. Above, a technician at a PSINet global hosting center helps keep customer networks humming.

And for making sure that ordinary phone wires can deliver packets at high speed to the home, Lucent's new Stinger product is the industry's first flexible, assured high-quality digital subscriber line (DSL) system. Stinger is in widespread trials, already serving St. Louis-based Primary Network in the United States and proving an entrant in the growing DSL market worldwide.

But whether revolutionary or evolutionary, a pivotal capability of the next-generation network is its programmability. This means the potential to define new services that combine voice, video and data in ways that make networks more valuable to users. Customers in the programmable switching market, growing at 20 percent a year, turn to Lucent's programmable Softswitch, our Excel switch and our 7R/E portfolio.

With our breakthrough advances in broadband technology, Lucent is fueling the growth of networks of all types by making possible new, reliable, secure services for people who want to communicate without limits — exactly what you'd expect from a leader in next-generation networks.



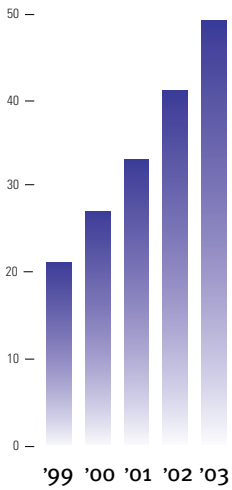
"When I'm not skateboarding, I'm surfing the Internet to talk to other skateboarders. There sure are a lot of us out there." Jamal Aldubayan, 10

Savvy Software
Seamless Services

Software will integrate today's optical, packet and voice networks into tomorrow's next-generation networks.

Communications Software Market

(dollars in billions)



The communications software market is growing 23 percent annually (based on industry sources).

Software is the network intelligence required to deliver the wealth of services people will need as they seek out new ways to communicate. Software is one of the hottest markets in communications — growing at 23 percent a year. Our software business continues to outpace the market, growing at 30 percent a year.

As the worlds of voice and data converge, software will help bind them together to work as one. For example, our open, programmable Softswitch will offer network providers a full range of seamless communications services on Internet protocol (IP) networks, packet based networks, and voice networks.

More than 40 customers and independent software vendors are currently working with Softswitch to quickly develop and deploy new, advanced services. One example is our software-powered TelePortal™ service that enables users to surf and "hear" Web page content from any telephone. And Lucent's software-smart Intelligent Assistant makes your voice a "command center" of sorts, enabling you to use natural speech to manage inbound and outbound calls and even voice mail.

Our software also lets users work on the Internet without missing an important call over the same line. With our Online Communications Center (OCC), users receive a "call waiting" message right on the computer screen with no disruption to the connection. They then can choose to receive the call via Voice over Internet protocol or let the call forward automatically to normal call coverage. Cavalier Telephone in Virginia is using Lucent's OCC to be the first to bring Internet caller-ID service to Richmond.

With services multiplying and networks converging, easy-to-use billing software is critical. The acquisition of Kenan Systems makes Lucent the world leader in billing and customer care software. Our billing systems are used by more than 150 customers in 30 countries on six continents. Kenan Systems software can quickly establish new services, then deliver a single bill for any combination of telephone, wireless, cable and Internet access usage.

Lucent's network management software also is hard at work "minding the network store." Take the NetMinder™ System for example. Among the world's best real-time decision support systems, the NetMinder System optimizes traffic flow during periods of network stress. The system handles every aspect of traffic data collection, monitoring and control across diverse networks and technologies, maximizing performance to prevent overload and failure.

Lucent and Bell Labs continue to commit strategic R&D to achieve software breakthroughs, create innovative technologies, then rapidly bring them to market. In fact, two-thirds of Bell Labs' 24,000 people develop software. As busy as the next-generation network crossroads may be, Lucent software will be there, evolving along with the hardware that shares the Lucent name.



Lucent's merger with Kenan Systems has made us a world leader in third-party billing and customer care software, a market segment growing at 30 percent annually. FirstWorld Communications signed agreements totaling $70 million for Lucent products, including Kenan billing software. Here, Kenan project manager Eric Wheatley (right) reviews new billing software installation with FirstWorld's Cyndi Lauda, enterprise billing manager, and Marion Jenkins, chief information officer.



Lucent is helping Sprint expand its all-PCS network, one of the largest in the United States. Our intelligent networking software lets customers, like this craft shop owner on the Tohono O'odham Nation Reservation in Arizona, activate service from their cell phones.



Softswitch Rules

Through the power of communications software, the voice network is now carrying data, too. Add the explosive growth of the Internet and new packet-based networks, and the picture is clear — the telecommunications industry is experiencing a convergence of technologies.

In the communications industry evolution, software holds much of the promise of reliability, competitive price and, most important, innovation.

After his company signed a strategic agreement worth up to $1 billion for Lucent systems and the breakthrough Softswitch, Level 3 Communications president and chief executive officer James Q. Crowe said, "The Lucent Softswitch, together with Level 3's Internet protocol network, will bring customers the best of both the traditional telephone network and the Internet — ubiquity and reliability combined with rapid cost reductions and innovative new services."

"I go everywhere with my dog, Daphne, except school.

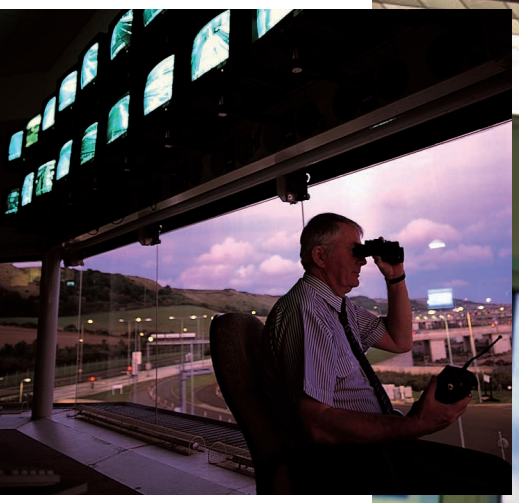
When I get home, I call my best friend and we take her to the park to play."

Michael Cliggett, 6



Next-Generation Networking

In a New Light

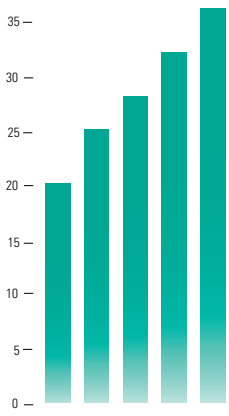


Lucent is a leader in optical networking, having delivered some 4,000 systems to customers worldwide. Our high-speed products will help EuroTunnel expand its communications network between Paris and London. Above, a EuroTunnel manager in a control tower on the British side keeps an eye on autos being loaded on trains for the trip to France.



Optical Networking Market

(dollars in billions)



The global optical networking market is growing 16 percent annually (based on industry sources).

"My dad says that lots and lots of information is carried through these tiny strands of fiber. Isn't that awesome?"

Kianna Underwood, 10

We believe optical networking will be as important to the 21st century as electricity has been to the 20th century.



Lucent's first-of-its-kind OpticAir™ system transmits information across beams of light to provide high-speed data networking directly through the air. Small enough to be placed on rooftops or in office windows, the system dramatically boosts the capacity of local networks where cost, geography or other constraints make fiber connections impractical. Here, two executives receive data through the system on a laptop computer.

As the torrent of Web pages, phone calls, e-mails, faxes and video clips inundates networks worldwide, service providers are turning to optical technology to meet this demand. In the new millennium, the world's most powerful broadband networks will be all-optical, delivering vast amounts of data to more people at the speed of light.

Optical networking, which boosts network bandwidth, or the capacity for carrying information, pumps information as pulses of laser light through hair-thin glass strands. Our WaveStar OLS 400G system uses a technique called Dense Wavelength Division Multiplexing (DWDM) to beam as many as 80 different colors of data-laden light down a single fiber strand, dramatically raising the fiber's capacity.

With more than 4,000 systems serving customers around the globe, Lucent is well ahead of its competitors in the deployment of DWDM technology. In fact, we've captured the largest share — 29 percent — of the $2.2 billion global DWDM market, according to industry analyst KMI Corporation.

And it's not hard to see why. We've shipped our WaveStar OLS 400G system to some 35 telephone companies, Internet Service Providers and other network providers worldwide. The system will play a major role in Global Crossing's new network, where it will team with our WaveStar BandWidth Manager — which routes data traffic as efficiently as voice traffic. The pair of products will help Global Crossing cover Europe with a glass highway of light, connecting people in 100 cities in the world's first high-capacity fiber-optic global network.

Lucent's Local Hero

Lucent's WaveStar systems are linking people all over the world, hurling trillions of bits of information a second across 50 countries on six continents as well as under the oceans. But our new high-capacity WaveStar AllMetro™ series is moving optical networking closer to home.

It's bringing bandwidth-boosting DWDM technology to local service providers, helping eliminate bottlenecks on their networks and helping give Web surfers lightning-fast access to cyberspace.

Air Lucent

Most optical signals speed over today's networks through fiber buried beneath the earth or on the ocean floor. Now, Lucent has launched a revolutionary new kind of optical networking system that uses photons to propel huge volumes of information through the air — up to 10 billion bits a second. That's 65 times faster than today's swiftest wireless systems. The system's compact transmitter can be placed on a rooftop or in an office window to beam information to a nearby building.

It's the first system to use DWDM technology without cables, and it will raise the capacity of local data networks, speeding up tasks like Internet access for people who use the network.

Fabulous Fiber

The rise of optical networking as an enabler of the communications revolution has increased Lucent's fiber and cable business by a wide margin. And it's growing even faster with the emergence of new players in telecommunications and the deregulation of global service providers. In 1999, we signed contracts with 18 new customers totaling more than $3 billion.

Our TrueWave® and AllWave™ fiber hold more than a 65 percent share of the new, high-growth application fiber market.

In 1999, we unveiled two undersea fibers, TrueWave Submarine RS and TrueWave XL, that enable network providers to greatly increase the capacity and transmission speed of their transoceanic networks. And our newest fiber offering, the LazrSPEED™ solution, is the industry's first fiber-optic cabling solution for enterprise networks that performs at speeds up to 10 times faster than other products on the market.