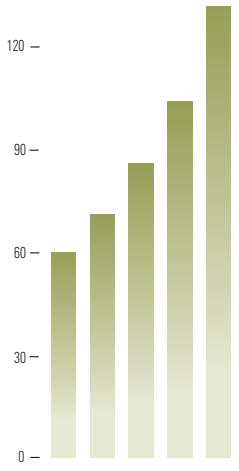
Next-Generation Networking **Takes to the Air**

Every minute, 26 people sign up for wireless service in the United States.

Wireless Infrastructure Market

(dollars in billions)



The global wireless infrastructure market is growing 22 percent annually (based on industry sources).

China alone adds 1.5 million new wireless users a month — 34 people a minute. There's a wireless revolution going on — and it's more powerful, more pervasive, more inclusive than ever. As the world speeds into a new millennium running on next-generation networks, Lucent is poised to lead that wireless revolution — with an expertise that isn't limited to a single technology, a single solution or a single continent.

Today, wireless networks carry an increasing volume of voice traffic. In less than a decade, the number of wireless users worldwide will equal wireline subscribers. People everywhere are on the move and talking. Wireless networks are rapidly evolving to support data and personal services and Lucent is leading the way.

Next-Generation Leader

We're prepared to take our customers to the next step in wireless — to 3G, the third-generation wireless services.

3G will offer high-speed on-ramps to the Internet at speeds approaching those that wires deliver at home or in the office. Subscribers will be able to surf the Internet, send mail or shop online.

Lucent is the only wireless solution provider involved in trials of multiple 3G technologies on four continents. We're participating with AT&T Wireless Services, Bell Atlantic Mobile and Sprint PCS in the United States, as well as with carriers in Japan, Australia and the United Kingdom. Our customers are already starting to leverage their existing networks to create revenue opportunities with location-based services and accommodate ever-growing amounts of voice and data traffic.

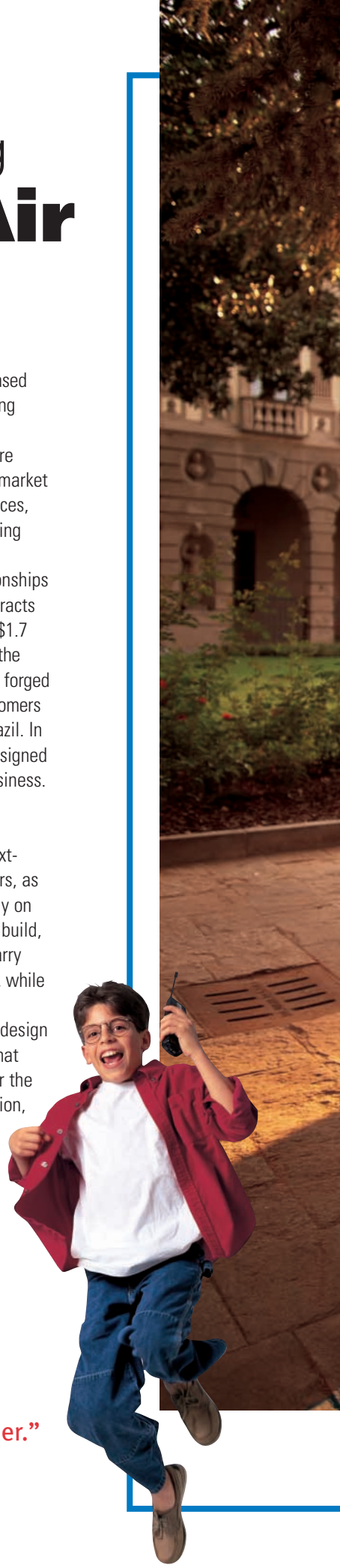
Many of the newest operators are counting on Lucent to gain a time-to-market advantage with next-generation services, thanks to our proven record in deploying networks quickly.

In 1999, we strengthened relationships with AT&T and Sprint by signing contracts that are expected to total more than $1.7 billion for equipment and services for the next phase of their PCS networks. We forged stronger relationships with other customers as well, including Telesp Celular in Brazil. In the Asia/Pacific region alone, Lucent signed more than a billion dollars in new business.

Investment Protection

Lucent is committed to supporting next-generation networks for new operators, as well as for current customers who rely on Lucent's and Bell Labs' experience to build, blend and evolve their networks to carry any mix of voice, data and multimedia, while protecting investments already made.

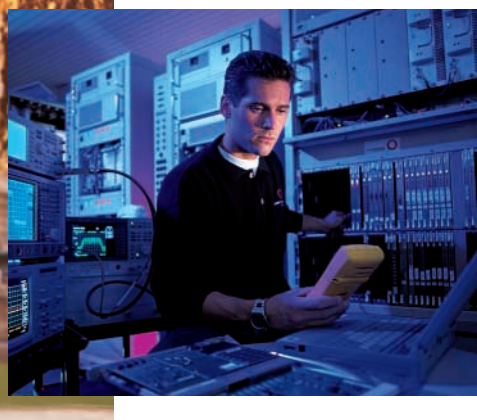
Lucent is uniquely positioned to design and deliver the end-to-end systems that wireless networks demand. Wherever the world is going in the wireless revolution, Lucent is intent on getting it there.



"My mom gave me my own cell phone for my birthday. Now I'm never late for dinner."
Peter Louis Cuttone, 11

Next-generation networks will enable mobile service providers like Italy's Omnitel to offer customers many capabilities, including high-speed wireless data. Lucent's 7R/E Packet Driver, coupled with our 5ESS switches, will help Omnitel evolve to the new network. Above, Lucent employees are helping Omnitel design part of its network near Milan.

Lucent is a step ahead of the industry in being able to demonstrate that packet networks designed for high-speed wireless data can be enhanced to transmit voice traffic. A common network based on our PacketGSM™ technology will efficiently handle both data and voice, as shown in tests performed by Lucent Lab Manager Don DeLorenzo at our lab in Swindon, England.





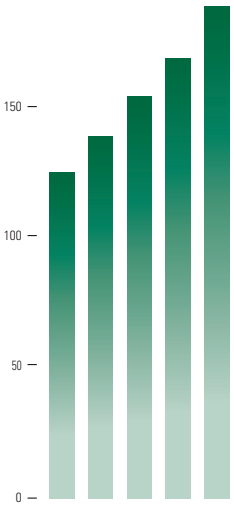
Lucent strengthened its relationship with AT&T in 1999, signing a four-year, $1 billion contract for equipment and services for the next phase of AT&T's nationwide Digital PCS wireless network. In addition, AT&T plans to add Lucent equipment in the metropolitan New York City area. Here, Lucent employees Andrea Lynn Stone, Bob Louis (center) and Tony Simonetti, on a New York City rooftop, review installation plans for part of the AT&T network.



Students at the University of Maryland's McKeldin Graduate Library at the College Park campus can stay connected to the college network no matter how deep they get buried in the stacks when they use a laptop equipped with a card connecting them to Lucent's WaveLAN® wireless network.

Enterprise Networking Market

(dollars in billions)



The global enterprise networking market is growing 11 percent annually (based on industry sources).

The Seattle Mariners' new home, SAFECO Field, uses Lucent voice and data networks to power its operations, from Internet ticket sales to concessions. Lucent's Cajun™ switches, a DEFINITY server, customer care solutions and SYSTIMAX cabling are part of the network that brings fans cutting-edge conveniences. Here, a Mariners' employee updates play-by-play statistics on the team's Web site.



Lucent's new IP Exchange Systems help Challenge Dairy, based in Dublin, Calif., control costs and create next-generation networks to help grow its business.

Business Connections That Count

Enterprises, from neighborhood shops to global powerhouses, look to Lucent for communications solutions and e-business applications to help them grow.

We're helping businesses move to an era when networks of all kinds will converge and operate as one, an era when businesses will operate as virtual enterprises with customers, employees, suppliers and partners connected through reliable, secure, flexible and efficient networks.

We know — inside and out — the real-world applications that make enterprises work. We're taking our leadership in messaging and call centers and transforming it into intelligent communications solutions that enable businesses to compete in an e-business world. These customers range from small boutique gift bakeries like Atlanta's Blooming Cookies to financial services giant Prudential.

We know that a voice mailbox can be much more than a place to catch messages when you're away from home. New products like www.messenger,™ which lets people access and manage their mailbox over the Web, and INTUITY™ Interchange,™ which ties together all an enterprise's mail systems, help weave the next generation of communications networks into a pattern for business success.



Uniglobe.com uses Lucent's CentreVu® Internet Solutions in the first fully integrated global customer contact center for online travel shoppers.

Real-World Communications

Both large and small enterprises, including nearly 90 percent of Fortune 500 companies, depend on our world-leading DEFINITY server for their communications and we've made those investments even more valuable.

With the DEFINITY IP Solutions portfolio, for example, enterprise customers need only add a card and software to turn the DEFINITY server into an ultrareliable "triple-network" server. And they can do so without changing their existing voice and data networks or disrupting service.

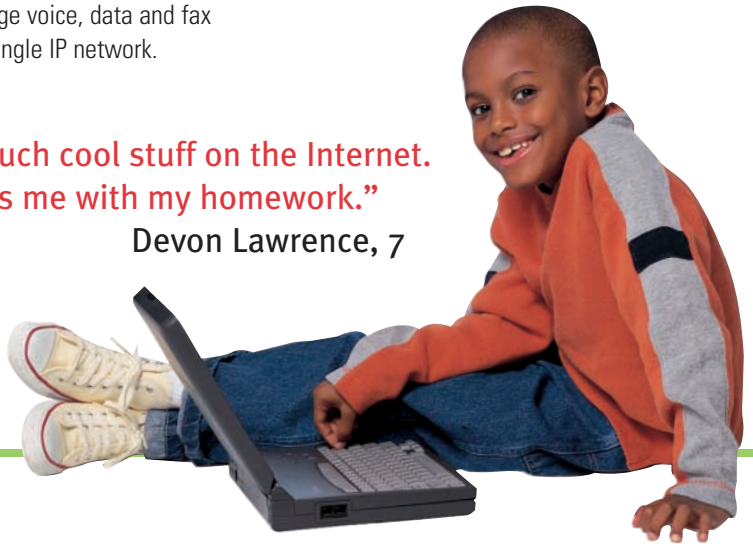
The new solution gives users access to a voice network, a network that uses Internet protocol (IP) technology, plus a network that employs a high-speed switching and transmission technology called Asynchronous Transfer Mode (ATM). The three seamlessly mesh to let users make phone calls and exchange faxes, as well as share key business-building applications like call centers and messaging.

Lucent's new family of IP Exchange Systems gives enterprises another option: It lets them build a software-based network that offers voice features over standard computer hardware, such as a Windows NT® server. It's the first of a new class of solutions that cost-effectively converge voice, data and fax transmissions over a single IP network.

Lucent is uniquely able to provide end-to-end solutions that combine the best of voice networking with the best of data. We're technology pacesetters in every key area of enterprise communications. Examples include our industry-leading DEFINITY communications servers, Voice over Internet protocol solutions, award-winning Cajun Campus data networking switches, a broad portfolio of wide area networking products, network security devices, network management software, enterprise wireless offerings for LANs and in-building telephony, and messaging and customer relationship management solutions. These systems all work — together and with the products of other vendors — to meet the changing needs of enterprises.

At a Pennsylvania school district, for example, education is moving into the next century with the help of an enterprise data and voice network installed and run by Lucent. Cajun ATM switches and Cajun Ethernet data switches are part of a complete data solution that works seamlessly with Lucent's leading-edge DEFINITY server, INTUITY Unified Messaging System and interactive voice response system. Together, these systems give 8,700 students and 600 teachers and administrators high-speed data links to the Internet, a homework hotline, and voice and e-mail services.

"I can find such cool stuff on the Internet. It really helps me with my homework."
Devon Lawrence, 7

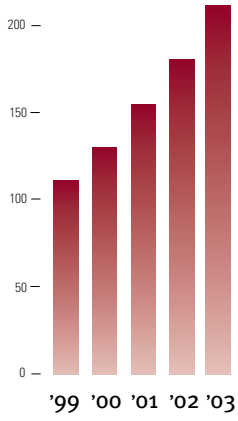


Windows NT is a registered mark of Microsoft Corporation.

The Knowledge Behind the Network

Network Support Services Market

(dollars in billions)



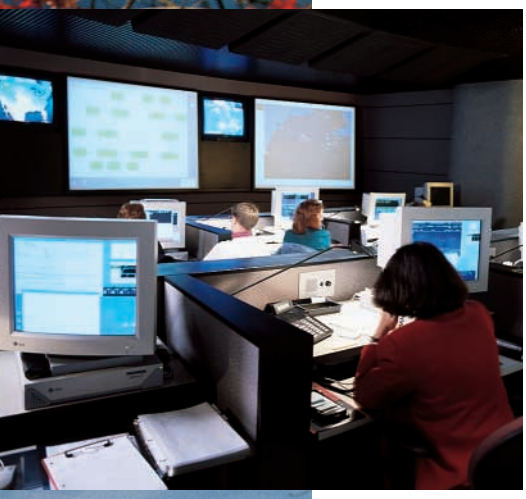
The global market for network support services is growing 17 percent annually (based on industry sources).



Lucent NetCare centers worldwide provide a central point of contact for all our NetCare products and services on an around-the-clock basis. Lucent's Nathalie Möschberger (foreground) and her colleagues at our center in Sophia Antipolis, France, keep customers in the region updated on the resolution of network problems.

With our acquisition of network services powerhouse INS, Lucent now helps more than 10,000 clients in 93 countries design, build and manage their networks. When Babson College near Boston needed to expand its networks, INS evaluated the existing network operating system and provided a plan for migration to a new system. Students, faculty and staff use the new network for e-mail, Internet access and other applications.







When BellSouth International (BSI) needed help in planning, designing and implementing Internet Service Provider services for BSI's affiliates in South America, Europe and the Middle East, they turned to Lucent's NetCare Professional Services (NPS) for help. NPS built a fully functional prototype and test system, which will also be used for training employees of BSI affiliates prior to full-service rollout of the services in their respective countries.

Like no other company, Lucent is positioned to help customers build and run high-performance networks.

To capture the promise of the network of networks requires much more than electronic boxes and cables. It demands network knowledge — from experts who can quickly plan, design, implement and operate multivendor networks that deliver information, reliably and profitably, around the clock and across the globe.

Our team of 5,500 consultants, technicians and engineers in 93 countries supports more than 10,000 clients worldwide. Among them are more than half the companies in the Fortune 100, and one-third of those in the Fortune 1000, including such blue-chip names as AT&T and Sprint.

When we ask our customers what is most important to them, the answer we often hear is how to smoothly integrate new networks into existing networks — and do it at Internet speed.

Consulting the Experts

As networks grow more complex and ever more central to business success, many customers are assigning their network planning, implementation and support to outside experts. This trend has created a global market for network professional services that is growing at 17 percent annually.

In 1999, Lucent moved to seize this opportunity by acquiring the world's premier multivendor network consulting company, International Network Services — a company that grew its revenue in the past year by 82 percent.

This acquisition, together with technology and talent acquired from Ascend Communications and Lucent's own strength in network installation, maintenance and operations — including state-of-the-art network operations and support centers — gives Lucent powerful offerings for each phase of the network life cycle.

With INS and Ascend, Lucent added consulting and service capabilities in today's hottest digital networking technologies, such as Asynchronous Transfer Mode, frame relay and Internet protocol. INS added 2,200 networking experts to the 3,300 already at work in Lucent's NetCare Professional Services (NPS) organization.

Lucent also added software, Web and knowledge systems for network service. Lucent VitalSuite™ is a family of network monitoring and management software from INS. The award-winning eSight interactive Web site from Ascend enables NetCare customers to manage and maintain their networks through assisted self-help around the clock. The Knowledge Network from INS is the world's largest database of network solutions.

NPS is a unique piece of Lucent's business — a people-intensive consulting operation that addresses the needs of customers, using a multivendor approach to ensure an independent view of network design for our customers.

Building from a base of strong leadership, effective operations, talented people and close client relationships, Lucent's NetCare Professional Services is prepared to outperform and outgrow its competition.



"I can find great things on the computer at school. When I get home, I can play great games on it, too."
Chaz Slemmons, 6

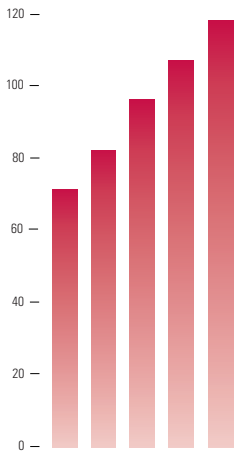
Small Packages Big Payoffs



The global Web population is expected to jump to 502 million in 2003, up from 196 million today. Lucent's computer modem chips speed up Internet access for many of those users, like the family shown here. The child taps into the Internet for homework help, while her mother uses a laptop to catch up on e-mail — both over a single phone line.

The Market for Lucent's Semiconductor Products

(dollars in billions)



The global market for the types of semiconductors sold by Lucent is growing 14 percent annually (based on industry sources).

Unseen, unsung, they're true heroes of the communications revolution.

They're hard at work in virtually every product that keeps the Information Age humming — from personal computers and cell phones to modems and disk drives, telecommunications and data networking gear. And they'll be every bit as important to next-generation networks.

They're semiconductor chips. They hold the integrated circuits whose job is to electronically process, store and move information. Today, Lucent is the worldwide leader in chips specially built for communications, according to leading industry analyst Dataquest. The reason: Our chips are in more communications systems than anyone else's.

And we intend to keep that lead. In our eyes, the big business challenge for the next century will be to address the needs of the communications industry as we create chips for next-generation networks.

Our strategy is to focus on customers who lead their segments of the communications marketplace. Their successful products translate into healthy sales for us. We're also placing our bets on solutions that put the electronics for an entire system like a cell phone on a single fingernail-sized slice of silicon.

Because of the complexity of such "systems-on-a-chip," they're less likely to become low-profit commodities. Just as important, they offer our customers big benefits such as lower cost, reduced power consumption and easier integration into their products.

Lucent is the leader in delivering solutions like these to our customers. In fact, we derive more than 50 percent of our microelectronics revenues from systems-on-a-chip. In 1999, we introduced the world's first true, universal single-chip solution for moving voice and data traffic from networks that use copper cables to those using fiber-optic connections. The solution slashes system costs for our customers as much as 80 percent, and cuts time-to-market by up to six months.

Speedier Internet Access

Other major system-on-a-chip offerings are companion pieces of a sort. Our new second-generation WildWire™ chip set is for the service provider's central office. With technology pioneered by Bell Labs, it economically enables subscribers to access the Internet and other networks over ordinary phone lines — at speeds more than 100 times faster than today's fastest modems.

The other half of the team is our WildCard™ solution. It also speeds up network access and downloading, but it's installed in personal computers.

To win in the world of next-generation networks, chip companies must offer comprehensive solutions that wed silicon and optics technologies. Today, Lucent is the only industry player that supplies both the chips and the optoelectronic components like lasers needed to move voice, data and video over converging networks.

In fact, in 1999 we announced the industry's first optical networking module that marries advanced optoelectronic components with system-on-a-chip integrated circuits. The new module cuts design time for high-speed transmission systems by six months to a year. It also reduces space needs for the circuitry, slashing power consumption some 50 percent.

Powering the Industry

Lucent is the power behind the communications industry, whether it's powering traditional telecommunications systems or Internet applications. Our business was ranked No. 1 in worldwide sales of power equipment in a $20 billion industry by market research firm Micro-Tech Consultants. We added more than 125 power customers in 1999 to our growing list of service providers and other customers around the globe.

We've redefined how tomorrow's semiconductors will be powered. For tight spacing in equipment and for superior performance, the revolutionary Titania™ Power Modules are the industry's smallest and fastest, and have outpaced the competition with unmatched reliability for next-generation microprocessors. Titania has won more than $100 million in contracts since April 1999 .



"My science teacher said that a silicon wafer the size of a CD can contain more than 700 chips, all going into neat communications gear."

Tristan Patrick, 9

A Look Ahead

For the future, we've launched the final piece of the supply, sales and production system that runs our business. It allows us to deliver chips to some customers in as little as 48 hours. The system controls the manufacturing schedule at all our plants worldwide and lets customers see where their orders are in the supply chain. What's more, it lets them influence factory production schedules daily, not weekly or monthly.

In an era where speed to market determines the winners and losers, we're betting on this new system to give us a leg up on competitors in product delivery. It's another strategic move aimed at keeping Lucent solidly ahead in today's red-hot marketplace.



Speed to market is a key determiner of success in today's competitive marketplace, and Lucent's new logistics system gets chip orders into customers' hands faster than ever. Part of that system includes an alliance with DHL Worldwide Express, which enables us to deliver chips to most customers in 48 hours or less.



Lucent has developed next-generation chip-making technology that will allow tiny wireless phones in wristwatches or earrings. Here, Lucent engineer Eddie Santos tests a wafer produced by our Orlando, Fla., facility.

Lucent's Ventures

Bell Labs is a gold mine of new ideas, and our New Ventures Group is helping us to pinpoint some of the choicest "nuggets" for development into hot new businesses. Above, Bell Labs researcher Kevin Curtis conducts tests on a new photosensitive material planned for use by Lucent in a high-capacity holographic memory that would store 125 billion bytes of data on a five-inch disk.

A dozen ventures have been launched since 1996, including the following, which were created in 1999:

- *Optical Disk Memory is a venture that will develop a new kind of optical disk technology capable of storing 10 times more data than today's magnetic disk drives.*
- *WatchMark offers software products that let wireless carriers optimize their networks for more efficient operation. This will reduce costs and boost quality for cellular calls.*
- *Persystant Technologies offers the BitRoom Collaboration system, which will enable businesses to conduct multimedia conferencing over the Internet.*