IBM HIGHLIGHTS, 1996 - 1999

November 2004

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Business Performance
IBM revenue reaches $75.94 billion, an increase of six percent over 1995, and earnings grow by nearly 30 percent to $5.42 billion. There are 240,615 employees and 622,594 stockholders at year end.

Speaking in Atlanta to a group of shareholders, analysts and reporters at the corporation's annual meeting, IBM chairman Louis V. Gerstner, Jr., discusses IBM's condition, prospects for growth and the importance of network computing to the company's future.

IBM reaches agreement with the United States Department of Justice to terminate within five years all remaining provisions of the Consent Decree first entered into by IBM and the U.S. government in 1956.

Organization
IBM forms the Network Computer Division in November. The company says it will operate its worldwide services business under a single brand: IBM Global Services. IBM puts its industry-specific business units on a single global general manager.

IBM and Tivoli Systems Inc. enter a merger agreement. Tivoli is a leading provider of systems management software and services for distributed client/server networks of personal computers and workstations. IBM's acquisition of Tivoli extends the company's strength in host-based systems management to multiplatform distributed systems.

IBM and Edmark Corporation, a developer and publisher of consumer and education software, complete a merger in December. IBM acquires The Wilkerson Group, one of the world's oldest and largest consulting firms dedicated to the pharmaceutical and medical products industry.

Products & Services
IBM introduces in September its third generation of microprocessor-based mainframes, the S/390 Parallel Enterprise Server. With twice the performance of IBM's previous high-end S/390 CMOS servers, it can be linked to other S/390 systems to deliver more than 10,000 MIPS. At the same time, IBM also launches the System/390 Multiprise 2000 line, designed specifically for customers who need more flexible networking capabilities and computing power. Shipments of mainframe power grow 50 percent during the year.

IBM announces in February the RS/6000 Model F30 server to support World Wide Web home pages and other applications, and in June, the company rolls out enhanced RS/6000 Internet POWERsolution Web Servers, new Internet POWERsolution Firewall and Proxy Servers, and new Internet Commercial Application Servers. The following month, three new RS/6000 servers debut — Models G40, J40 and R40 — using symmetric multiprocessor computing and the PowerPC 604 chip. New RS/6000 servers, including Internet-ready systems equipped with Lotus

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Notes and electronic-commerce software, are brought out in October. The U.S. Department of Energy selects IBM to build the world's fastest supercomputer. Capable of performing more than three trillion calculations per second (3 teraflops), the RS/6000 SP will simulate nuclear explosions and reduce the need for live tests. IBM also announces the R/390, a new server comprised of a RISC System/6000 computer with an integrated S/390 processor card.

IBM introduces the AS/400 Advanced Series, to support Lotus Notes and provide easy Internet access, AS/400 Advanced Entry for the owners of small businesses, and a new AS/400 Advanced 36 business computer.

In personal systems hardware, IBM announces the IBM PC Server 704, its first Pentium Pro-based server; new models of the PC Server family; new models of the PC 700 line; the Aptiva S Series, the first home computer that lets people place the monitor and media drives on the desk and tuck the tower out of the way; ThinkPad 560, ultra-thin 1.2-inch, 4.1-pound package; and new models of ThinkPad 760 and 365 series. The IBM ThinkPad 701, ThinkPad 755, Aptiva, PC 300 and PC Servers are featured in "Goldeneye," a new James Bond adventure film.

IBM becomes the first major company to introduce a network computer — the IBM Network Station, a new kind of desktop device that provides access to networked applications and processing power while reducing the cost of desktop computing. The Network Station enables customers to use an economical platform for doing net-based business ("e-business"). Among the storage product announcements are: two 2.5-inch disk drives, including the highest capacity low-profile drive available for notebook computers and the world's first disk drive products to exceed one billion bits of data in a square inch of disk space; new models of the RAMAC Array storage, including RAMAC 3, RAMAC Virtual Array Model 2, RAMAC Scalable Array and RAMAC Electronic Array; and the 3466 Network Storage Manager. IBM unveils in October the lightest 2.5-inch hard disk drive for mobile computers. (The world's first hard disk drive for computer storage was invented 40 years ago by IBM, and was the size of two refrigerators; this new drive is so small that two could be fitted into a shirt pocket.)

At Uniforum in San Francisco in February, IBM Chairman Louis V. Gerstner, Jr., lays out IBM's commitment to open, standards-based computing in the first ever keynote address at the major gathering of the world's UNIX community.

IBM introduces OS/390, a network-ready, open, integrated large server operating system that can run both MVS and UNIX applications, and a new release of the Virtual Storage Extended/Enterprise System Architecture operating system.

The DB2 Universal Database, a multimedia and Web-enabled solution, is announced in December. Earlier, IBM introduces 12 application development and data management solutions, including VisualAge for BASIC and new DATABASE2 versions. IBM's CICS transaction processing software is ported to run on all leading platforms. In 1996, some 70 percent of the

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world's business information is managed by IBM databases, and IBM transaction processing software handles more than 20 billion mission-critical business transactions a day.
IBM introduces in September OS/2 Warp 4, which incorporates Netscape Navigator, Sun's Java technology and IBM speech-recognition software. More than 50,000 copies of OS/2 Warp Server, IBM's PC server operating system, are sold worldwide through the end of April, and the total number of OS/2 Warp licenses reaches six million and overall OS/2 purchases top 12 million by December.

Among the other 1996 software announcements are: the initial availability of the IBM Net.Commerce system, software that makes it possible for businesses to quickly, easily and safely create virtual storefronts on the Internet; IBM Software Servers, an integrated series of leading IBM and Lotus software solutions for Internet access, data management and collaborative computing; the delivery of VoiceType 3.0 for Windows 95, enabling users to work with their computers simply by talking to them; the introduction of VoiceType Simply Speaking, software that allows users to open an application, dictate a memo or edit a document without touching a keyboard; IBM AntiVirus Version 2.5; and IBM PC SystemView 4.0.

At Fall Internet World 1996 in December, IBM Chairman Louis V. Gerstner, Jr., unveils the notion of the "new killer apps," a world of transaction-intensive, networked applications delivered to a world of connected individuals by all of the world's most important institutions. At a time when the conventional wisdom casts the Internet as the home of games, information and e-mail, this speech reorients the debate around the more profound vocational implications of networked computing.

IBM launches a number of network computing products and services in 1996, including: IBM Cryptolope containers to seal intellectual property in a digital package so that people can buy and sell content securely over the Internet; the WOMplex (Web Object Manager), an IBM technology that enables web sites to serve millions of visitors in a highly customized way; Weblicator, a Lotus replication technology for standard web browsers allowing users to download copies of Web sites and browse them later without being connected to the Internet; the SecureWay Key Management Framework, a collection of applications, services and cryptographic engines that help make the Internet safe for electronic commerce; World Avenue, an online shopping mall designed to help retailers get on the Net more quickly and more affordably than they could on their own; Insure-Commerce, a set of network-based products and services to help the worldwide insurance industry reach and serve its customers; Managed Data Network Services, a family of networking solutions for high-speed business communications and corporate intranets; and the IBM Network Printer 24 (the fourth member of the IBM Network Printer family which is introduced in June and includes the IBM Network Printer 12 and 17, and IBM Network Color Printer).

IBM unveils the PowerPC 401GF embedded controller, a chip with high-performance and low-power features for consumer electronics, communications and office automation products.

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IBM begins a pilot program with MasterCard in September using Secure Electronic Transaction (SET) technology. The software secures credit card transactions over the Internet.

At the 1996 Centennial Olympic Games in Atlanta, Georgia, IBM demonstrates the largest integrated information technology system ever seen by a mass audience. IBM systems are deployed on 30 interconnected venues. An estimated three terabytes of time-sensitive, transaction-oriented data are collected during accreditation, games management, scoring and other events, and are passed through 7,000 microcomputers, 250 LANs, 500 data lines and 2,000 wireless computers and other system communications devices. The system also supports 80 AS/400 servers and four System/390 mainframe computers. An IBM SP2 supercomputer acts as the World Wide Web server and runs the Regional Weather Forecasting System.

Three of the U.S.'s leading healthcare organizations — spanning eight states and almost 30,000 physicians — use IBM's Health Data Network solution to link their healthcare enterprises.

Lucent Technologies and IBM's ISSC subsidiary sign a multi-year, multi-billion dollar outsourcing agreement, in which ISSC will manage the majority of Lucent's day-to-day information technology operations. IBM and The MetraHealth Companies, Inc., a subsidiary of United HealthCare Corporation, signs a 10-year, $540 million contract for information technology services. IBM reports in August that its worldwide outsourcing business reaches a total commercial contract value of $40 billion since the business was launched in 1991, driven by new business signings of $5.1 billion recorded during the first half of the year.

<u>Alliances</u>
Sixteen banks and IBM come together to form the Integrion Financial Network to deliver home banking to more than half of the retail banking population in North America.
IBM and Hughes announce a multi-year agreement to create high-speed communications products based on a new type of silicon chip that is several hundred percent faster than current commercial offerings.

The National Hockey League, in partnership with IBM, form an alliance — NHL Interactive Cyber Enterprises — that will use new and emerging technology to promote the growth of hockey worldwide. The PGA of America teams with IBM to present a state-of-the-art cybercast of the 78th PGA Championship which takes place in August in Louisville, Ky.

IBM and Siemens Power Systems Control announce a service that enables electric utilities to use computer networks — including the Internet — to offer excess electric power transmission capacity for sale.

IBM partners with American Express to pilot smart cards for ticketless air travel.

ISSC Australia and Telstra, Australia's largest telecommunications provider, say they intend to establish the country's largest commercial communications and data processing center.

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Science & Technology
For the fourth consecutive year, IBM surpasses its own record for U.S. patents, receiving 1,867 U.S. patents from the U.S. Patent and Trademark Office, 329 more than any other company receives in 1996.

Three IBMers are inducted into the Women in Technology International Hall of Fame: Ruth Leach Amonette, IBM retiree (and in 1943, the company's first female vice president); Dr. Barbara D. Grant, general manager, Tucson, and vice president, Storage Systems Division; and Linda S. Sanford, general manager, System/390 Division.

In the Deep Blue versus World Chess Champion Garry Kasparov tournament — the first ever traditional chess match between man and computer — IBM's Deep Blue wins one match, ties two and loses three. Deep Blue is a combination of special purpose hardware and software with an IBM RISC System/6000 SP2, a system capable of examining 200 million moves per second, or 50 billion positions, in the three minutes allocated for a single move in a chess game.

IBM sets a new world record in magnetic data-storage density — five billion bits of data per square inch — the equivalent of 312,500 double-spaced typewritten pages (a stack 104 feet high) in one square inch of disk surface.

IBM scientists publish evidence that a fundamentally new type of electron behavior is responsible for the so-called "high-temperature" superconductivity that was first discovered in a certain class of ceramic materials 10 years ago.

IBM researchers demonstrate technologies that allow an "electronic wallet" to receive pages, act as a universal credit card, scan in a receipt, transmit messages or be used as a phone.

Facilities
IBM says it will expand operations at its computer disk drive manufacturing sites near Szekesfehervar, Hungary and in Singapore. The company also announces an additional $440 million investment for disk drive and component manufacturing expansion, including a new disk drive manufacturing facility in Prachinburi, Thailand; and new capacity in San Jose, Calif., and Mainz, Germany.

IBM says it will open a new international HelpCenter in Dublin, Ireland, and expand its HelpCenter in Greenock, Scotland, as part of a $150 million investment by the IBM PC Company to maintain and expand its worldwide PC telephone support capabilities.

Corporate Citizenship
IBM is the largest corporate contributor in 1996. Over the last decade, IBM has contributed more than $1.3 billion to nonprofit organizations, schools and universities — close to four million hours of volunteer time in the United States alone, and millions more around the world.

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IBM hosts the National Education Summit attended by U.S. governors, business leaders and President Bill Clinton. The summit addresses ways to raise national education standards and achievement. Speaking at the opening plenary session, IBM Chairman Louis V. Gerstner, Jr., delivers remarks on the role of industry in transforming the nation's schools. IBM has contributed $35 million to help school systems remove barriers to student achievement.

Twelve non-profit organizations and consortia are selected to receive grants valued at a total of $2.5 million through the company's Workforce Development Technology Grant Program which funds the innovative uses of technology in job training and adult education.

IBM establishes a computer training center in Bosnia-Herzegovina.

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Business Performance
IBM revenue increases to $78.50 billion, three percent more than in 1996, and net earnings reach $6.09 billion, a 12 percent increase over the year before. There are 269,465 employees and 623,537 stockholders at year end.

IBM Chairman Louis V. Gerstner, Jr., addresses more than 900 stockholders at the IBM annual meeting in Dallas, and describes how the company is rebuilding the competitiveness of its traditional businesses, and its progress in moving into new, high-growth areas, such as distributed software and services.

Organization
IBM announces plans in May to become sole proprietor of Advantis — the U.S. data network services arm of the IBM Global Network — by buying Sears' 30 percent equity interest. The company acquires in December Eastman Kodak's share of Technology Service Solutions, which was formed in 1994 by IBM and Eastman Kodak. TSS becomes a wholly-owned subsidiary of IBM. IBM and NetObjects, Inc., announce that IBM has purchased a majority interest in NetObjects, a leading provider of website development tools for designers and intranet developers.

Tivoli Systems, a subsidiary of IBM, and Software Artistry, Inc., reach a merger agreement, in which Software Artistry — a leading provider of both consolidated service desk and customer relationship management solutions for distributed enterprise environments — will become a Tivoli business unit. Tivoli Systems also acquires Unison Software, Inc., a leading developer of workload management software for distributed computing environments.

Products & Services
IBM completes in June one of the most important product transitions in the company's history with the debut of a new generation of System/390 servers, all powered by advanced microprocessors. The microprocessor "engines" help make the S/390 Parallel Enterprise Server -

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Generation 4 (G4) more powerful and less costly to produce and maintain than previous models, which used bipolar processor technology. Four months later, IBM unveils 15 new models of the S/390 Multiprise 2000 server family.

The company reports in September performance improvements from the new Power PC 604e microprocessor that make the RS/6000 SP up to 58 percent faster. The next month, the RS/6000 Model 70 server, the most comprehensive 64-bit UNIX computing solution available, is rolled out.

The company announces in August a new family of AS/400e series servers to help small and medium-sized companies and departments of large enterprises to take advantage of business opportunities on the Internet.

IBM introduces Netfinity, a new line of enterprise PC servers beginning with the Netfinity 7000 supporting the Microsoft Windows NT computing environment. Netfinity servers range from entry level models to high-capacity symmetric multiprocessing machines. The company also rolls out the IBM PC Server 315 during the year.

IBM introduces in March the IntelliStation, a line of Microsoft Windows NT-based workstations for commercial users. The new family complements IBM's RS/6000 line of UNIX workstations and servers. The first in that line of professional workstations is the IBM IntelliStation Z Pro. The new IntelliStation M Pro NT workstation is added to the line up in October.

IBM says in July that two new network computers are joining the existing IBM Network Station 100: the IBM Network Station Series 300 and the Series 1000. Shipments of the Network Station Series 1000, the industry's first network computer to run Java applications, including Lotus eSuite, begin on Dec. 1.

Other personal systems announcements in 1997 include: the PC 300PL; three new models of the IBM Aptiva S series and four new models of the Aptiva C series in February; eight new models in the E, L and S series of the Aptiva PC line in September; the Aptiva E16 and Aptiva L71 in November; the ThinkPad 380, ThinkPad 310ED and ThinkPad 560X; and the ScrollPoint mouse — the latest ease-of-use innovation for PC users to provide one-touch, 360-degree scrolling for easy Internet surfing and document navigation.

IBM introduces in April the RAMAC Virtual Array Storage 2 Turbo system, which delivers up to 100 percent faster performance than the original RAMAC Virtual Array introduced in 1996. The following month, the Travelstar 5GS is rolled out as the world's first 5-gigabyte laptop disk drive. IBM delivers in June the Magstar Virtual Tape Server, an integrated hierarchical storage management system for users of ES/9000, ES/3090 and S/390 enterprise servers. The company announces in October the 8.1-gigabyte Travelstar 8GS, the first drive to exceed 3 billion bits per square inch on each of its disk platters, a world record. (Not much larger than a music cassette

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tape, it will hold enough information that when printed, would constitute a stack taller than the Empire State Building.) That same month, IBM begins shipping four new server hard disk drives, including the 9.1-gigabyte Ultrastar 9ZX, with the fastest seek time (10,000 rpm) of any hard disk drive being shipped. The next month, IBM announces the world's highest capacity desktop OPC disk drive. The 16.8-gigabyte drive incorporates breakthrough technology called giant magnetoresistive (GMR) heads. No bigger than the head of a pin, the GMR head is the world's most sensitive sensor for reading and writing computer data on magnetic disks.

IBM sets a record by backing up a 736-gigabyte Oracle database, one of the largest databases ever tested, in less than an hour and a half.

IBM begins shipment in September of DB2 Universal Database, the industry's first fully scalable, Web-ready database management system. Called "universal" because it can sort and query alphanumeric data — as well as text documents, images, audio, video and other complex objects — DB2 Universal Database can perform a wide range of tasks from decision support to business transactions. The company later announces the DB2 Scholars Program, a higher education initiative designed to provide universities, professors and students with more than $30 million in database applications, training and support. The DB2 Scholars Program is a worldwide program that offers 150 colleges and universities copies of IBM's DB2 Universal Database, along with service and support for schools offering course work in relational databases.

Among IBM's other software products 1997 announcements are: the latest version of IBM eNetwork Software, to permit faster access to enterprise and Internet information; OS/390 Version 2 Release 4; VSE/ESA Version 2 Release 3; VisualAge 2000, designed to help companies make their applications Year 2000 ready; the availability of Lotus Domino for System/390 mainframe servers, providing the industry's leading groupware solution on the industry's most powerful and secure server; ADSTAR Distributed Storage manager Version 3; and MQSeries Version 5 messaging software.

With the introduction of eSuite in November, Lotus becomes the first company to offer a complete set of business productivity software written in Java for the network computing environment. Included in the eSuite are e-mail, calendar, address book, word processing, spreadsheet, presentation graphics and project scheduling applications. IBM ships four million Lotus Notes seats in the fourth quarter of 1997, the largest quarter ever of unit volumes for Notes. The totaled installed base reaches 20 million, up from 2.2 million when Lotus joined IBM in 1995.

IBM unveils ViaVoice continuous speech recognition technology for Mandarin Chinese in September. In developing the product, researchers identified and classified thousand of vocal tones and homonyms, created an algorithm that deconstructs syllables into parts, and developed a new language model to transform spoken words into the right combination drawn from 6,700 Chinese characters. Two months later, IBM announces ViaVoice Gold, software that gives people

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a hands-free way to dictate text and navigate the desktop with the power of natural, continuous speech.

At a White House ceremony in July announcing the release of the Clinton Administration's framework for global e-commerce, IBM Chairman Louis V. Gerstner, Jr., delivers remarks on how the Internet has transformed the way companies do business. In October, Mr. Gerstner announces to IBM employees the debut of a major strategic campaign built around the IBM-coined term "e-business" and details the company's commitment to lead on two fronts: successfully taking customers into this world; and transforming IBM into the world's leading example of e-business. In his first major customer address on e-business — and a speech considered by many as the first "wake-up call" to Wall Street on the implications of the networked world — Mr. Gerstner describes to the Securities Industries Association in November the Internet's ability to challenge centuries-old business models and transform the nature of all important transactions between individuals and institutions.

The company launches a free U.S. Patent Search Web site (www.ibm.com/patents) that provides access to more than two million patents issued by the U.S. Patent and Trademark Office from 1974 to the present. Also rolled out is Asset Services, a new Internet-delivered offering to help customers track, manage and maintain control of their multivendor desktop computers and software, and the costs of distributed computing.

IBM announces Magic 3D Coloring Book, the first in a series of award-winning Crayola interactive multimedia products that inspire creativity and learning among young children. IBM's Edmark educational software subsidiary ships "Let's Go Read! An Island Adventure," the first in a new series to help children build reading skills.

Six new active matrix Thin Film Transistor Flat Panel color monitors are brought to market.

IBM introduces IBM ServicePac, an offering of packaged technical support to customers of all sizes. IBM expands its Business Computing Utility service offering to Prague. First established in Budapest, this unique e-business service gives small- and medium-sized businesses access to business management applications running on servers at IBM data centers 24 hours a day, seven days a week.

The State Hermitage Museum of St. Petersburg, Russia, and IBM announce an art and technology partnership. Also announced during the year are technology projects with the Library of Congress and with Yale University's Beinecke Rare Book and Manuscript Library to use IBM Digital Library technology to preserve art and scholarship while protecting ownership rights.

IBM says that the National Football League, NBC Sports and IBM will jointly produce the official Super Bowl XXXII Web site. IBM Canada Ltd. signs a one-year sponsorship with the Ottawa Senators NHL team.

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Alliances

IBM and EDS announce a software agreement — believed to be one of the largest in the history of the software industry — that gives EDS access to a wider range of products to support its clients' global needs while streamlining costs associated with software purchases.

IBM, Telstra and Lend Lease Corporation form an information alliance, signing Australia's largest information technology outsourcing deal and establishing a new network services company called Advantra. As part of the agreement, IBM Global Services Australia will take responsibility for Telstra's data center operations, creating the largest data processing center in the Southern Hemisphere.

IBM, China Great Wall Computer Shenzhen Company and Shenzhen Kaifa Technology Company Limited establish The Shenzhen Hailiang Storage Products Co., Ltd., a new joint venture for the manufacture of magnetoresistive head gimbal assembles, a key component of hard disk drives.

Science & Technology

For the fifth consecutive year, IBM receives more U.S. patents — 1,724 in all — than any other company.

In a six-game match, a chess-playing IBM computer known as Deep Blue defeats chess grandmaster Garry Kasparov — the first time a reigning world champion loses a match to a computer opponent in tournament play. Deep Blue is an IBM RS/6000 SP supercomputer capable of calculating 200 million chess positions per second. At the Wake Forest University commencement exercises in May, IBM Chairman Louis V. Gerstner, Jr., offers the graduating class his perspective on what was learned from the "man-versus-machine" match.

Three IBM scientists — Robert Dennard, Mark Dean and Dennis Moeller — are inducted into the U.S. National Inventors Hall of Fame. To date, only 137 people have been so honored. IBM Fellow Emeritus Richard L. Garwin receives the Enrico Fermi Award for contributions to national security and arms control, and for his achievements in nuclear and particle physics.

NASA's *Pathfinder*, equipped with IBM RS/6000 technology for its onboard flight computer, lands on Mars. (The flight computer is responsible for more than 100 pyro events, including deploying the parachutes, inflating the airbags and firing the retro rockets that allow *Pathfinder* to land safely.) The Space Shuttle carries 11 ThinkPads into Earth orbit. Combined, the ThinkPads can process more than half a billion instructions per second.

IBM scientists announce a breakthrough semiconductor manufacturing process that uses copper instead of aluminum to link transistors in chips, the culmination of 30 years of experimentation and inquiry. With copper, which conducts electricity 40 percent more efficiently than aluminum, semiconductor devices like microprocessors and memory chips can be more powerful and more energy efficient.

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IBM Research sets a new world record for disk drive storage density — 10 gigabits per square inch, equivalent to 1,450 average-length novels.

IBM's Tokyo Research Laboratory unveils software that reads aloud information displayed on the computer screen. The software allows the visually impaired to access and use the Internet.

Two IBM Research scientists create the world's first public-key encryption scheme that provides a mathematically proven uniform level of computer data security.

Facilities
IBM dedicates its new state of the art corporate headquarters in Armonk, N.Y. in September. Although smaller than previous headquarters, the new 280,000 square feet facility has an open office design and many more meeting areas for team and customer interaction. The building is equipped with a high-speed wire and wireless communication network, and a technology gallery that features IBM products and innovations throughout the company's history.

IBM announces plans to invest $700 million to build one of the world's most advanced microdevelopment facilities at IBM's site in East Fishkill, N.Y. The facility will be among the first to produce chips on 12-inch silicon wafers and will use IBM's unique copper manufacturing process and advanced X-ray lithography technology.

IBM announces a five-year, $25 million investment to establish the Solutions Research Center — its eighth research center in the world — in Delhi, India. As part of its mission, the Center will foster joint research projects with India's top universities and educational institutions, and will focus initially on weather forecasting.

Corporate Citizenship
IBM gives more than $100 million to programs for people in need, including corporate contributions and donations from the IBM International Foundation. Individual employees give another $30 million in matching grants and donations to nonprofit organizations and educational institutions in the communities where they work. Each year IBM provides several million dollars' worth of new technology to more than 1,600 U.S. nonprofit health and human services organizations through the United Way's network of agencies. IBM employees volunteer nearly four million hours of service.

IBM provides $10 million in new Reinventing Education grants to 12 U.S. school districts and state education departments, bringing the total to $35 million since the program was established in 1994. IBM Reinventing Education grants in South Africa — part of a $35 million IBM initiative — help equip schools and train teachers on how technology can help them develop innovative curricula.

The U.S. Environmental Protection Agency recognizes IBM for outstanding contributions in protecting the Earth's ozone layer. Since 1993, IBM has completely eliminated the annual use of more than 12 million pounds of CFCs and three million pounds of methyl chloroform from its

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products and processes. More than two-thirds of the nonhazardous waste generated by IBM during the year is recycled.

IBM receives the Golden Ladder Award from *We* magazine for being the "No. 1 Employer in America for People with Disabilities."

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Business Performance
IBM revenue reaches $81.66 billion, four percent more than in 1997, and net earnings are $6.32 billion, a four percent increase over the year before. There are 291,067 employees and 616,800 stockholders at year end.

IBM Chairman Louis V. Gerstner, Jr., addresses stockholders in April at the Chicago annual meeting, focusing on IBM's leadership and technology breakthroughs of the past year. The next month, he meets with security analysts in New York and outlines the company's three emerging engines of growth — services, software and OEM technology (primarily semiconductors and storage).

Organization
The IBM Technology Group is established in October to pursue growth opportunities in the OEM marketplace.

IBM expands the number of industry-focused solution units from 11 to 20, consolidates the overall management of the industries into six sectors, creates a new centralized industry marketing team and streamlines its solutions development efforts. In addition, two geographic units — IBM North America and IBM Latin America — are unified into IBM Americas.

IBM acquires CommQuest Technologies, Inc., a company that designs and markets advanced semiconductors for wireless communications applications, such as cellular phones and satellite communications. CommQuest becomes a unit of IBM's Microelectronics Division.

IBM's Tivoli Systems completes its merger with Software Artistry, Inc., a leading provider of both consolidated service desk and customer relationship management solutions for distributed enterprise environments.

IBM acquires The Chem Systems Group Inc., a management consulting firm serving chemical and petroleum companies, which will function as part of IBM Consulting.

IBM creates an independent software company to focus on the high-growth customer relationship management market. The company is to be headquartered in Indianapolis, with sales, development and support locations worldwide.

IBM and AT&T announce in December a series of strategic agreements under which AT&T will acquire IBM's Global Network business for $5 billion in cash, and the two companies will enter

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into outsourcing agreements with each other. IBM will outsource a significant portion of its networking needs to AT&T, and AT&T will outsource certain applications processing and data center management operations to IBM.

Products & Services

IBM introduces in May the IBM S/390 - Generation 5 (G5) server, the most powerful S/390 computing system. Two months later, IBM says the S/390 G5 Parallel Enterprise Server 10-way Turbo model has smashed the 1,000 MIPS barrier, making it the world's most powerful mainframe. The company ships its 1,000th S/390 Parallel Enterprise Server - Generation 5 in November — less than 100 days after G5 manufacturing began, marking the largest ramp-up in S/390 history. In all, 1998 shipments of mainframe computing power, measured in MIPS, increase 60 percent over 1997.

IBM unveils ASCI Blue Pacific — the world's most powerful computer — which is capable of performing 3.9 trillion calculations per second. It would take 63,000 years for a person using a calculator to perform as many calculations as this computer can perform in a single second. IBM announces in April improvements to the RS/6000 SP — the result of IBM's new 332 MHz PowerPC 604e microprocessor — that deliver five times the performance of the IBM Deep Blue computer that defeated chess Grand Master Garry Kasparov.   The next month, the company rolls out the RS/6000 HA50 High-Availability Cluster Server which uses clustering technology that allows more than one computer to be linked together to provide superior reliability and availability. A month after that, IBM reports record-breaking business intelligence benchmarking results using the RS/6000 SP, DB2 Universal database Enterprise-Extended Edition and IBM's Serial Storage Architecture disk technology. IBM and FTL Systems announce in June breakthrough software running on an RS/6000 SP supercomputer that can test and verify electronic circuits and chip designs hundreds of times more complex than can be tested at the time. IBM introduces its first server — the RS/6000 Enterprise Server Model S70 — powered by a new second-generation 64-bit microprocessor that set a record for speed on the Web, and the RS/6000 43P Models 260 and 150. The U.S. National Weather Service selects IBM to provide an IBM RS/6000 SP — more than 10 times more powerful than the system made famous during Deep Blue's 1997 victory over chess Grand Master Garry Kasparov — to improve the agency's national weather and climate forecasting capabilities. IBM debuts the RS/6000 HA-S70 Advanced Cluster Server, a packaged solution that includes two preconfigured S70 Advanced servers coupled with IBM's High Availability Cluster Multi-Processor software.

The AS/400e server 170 and AS/400e server 150 are introduced in February, followed by the AS/400e model S40 and 650 and AS/400e model 170 in August. During 1998, IBM delivers an AS/400 to a customer every 12 minutes of every workday.

The Netfinity 3500 server is rolled out in February. Two months later, IBM announces a broad range of e-business tools, including the Netfinity 5500 midrange server; the Netfinity 3000, a

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low- cost, entry-level server; the IntelliStation M Pro, to allow users run graphics-intensive applications and business applications on the same platform; the PC 300PL; the next generation of IBM monitors; and packaged e-business network solutions.

The company reports record-breaking performance for business intelligence solutions based on its Netfinity line of servers along with Windows NT-based workstation performance records by the IBM IntelliStation M Pro. IBM also introduces the Netfinity 7000M10, 55000M10 and 5000 servers; the IntelliStation E Pro, a Windows NT workstation for customers who require fast 2D and entry-level 3D graphics; and enhancements to its Network Station family of network computers, making IBM the first thin client maker to support more than 30 languages.

Other 1998 personal system announcements include: the PC 300GL based on the Intel Celeron processor; Aptiva E76, the first model of the Aptiva E Series to be powered by an Intel Pentium II processor; Aptiva E86, the first member of the E Series to feature DVD technology; Aptiva E84 and E56; Aptiva E85 and E96; Aptiva SE7 and E4N; Aptiva E2U, E3U, E5U and E6U, three of which deliver ViaVoice speech recognition software; ThinkPad 385XD and 380XD, 310ED and 560X; ThinkPad 600 Model 35U; ThinkPad 600 560Z and 380Z models; and the ThinkPad i Series, IBM's first mobile computer line designed exclusively for consumers.

IBM introduces in January its Home Director Professional solution, providing consumers with an intelligent link between commonly available home systems, such as security, lighting and HVAC systems. The company also rolls out Universal Management, the industry's most comprehensive suite of systems management tools designed to lower the cost of ownership throughout the PC life cycle.

During the year, IBM sets repeated records in hard disk drive storage densities, culminating with a world record drive for notebook computers — holding 14.1 gigabits per square inch, or a trail of paper more than 1,200 miles long. In addition, the Microdrive is introduced in September as the world's smallest and lightest hard disk drive. Weighing less than an AA battery, it can hold more than 200 times more data than a floppy disk.

In other storage systems developments, IBM announces Travelstar 6GT, the highest capacity 2.5-inch slimline hard disk drive for notebook computers, holding 6.4-gigabytes or about three times as much information as the average notebook hard drive; the next generation of 18GB and 9GB 10,000 rpm hard disk drives and 20/40GB DLT and 10/20GB NS Internal SCSI Tape Drives; performance enhancements for the Magstar MP 3570 Tape Subsystem; the world's smallest and lightest hard disk drive, with a disk platter the size of a large coin; the Travelstar 14GS notebook computer hard drive that can hold all of the double-spaced text of paper stacked 2,338 feet high; and Ultrastar 9LZX hard drive, ideal for use by video producers and movie editors.

To mark the 100th anniversary of magnetic recording in November, IBM announces the IBM Deskstar 25GP as the world's highest capacity hard drive for desktop PCs. (The first disk drive in 1956 had a capacity of 5 megabytes; the Deskstar 25GP has 5,000 times the capacity of that first

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drive.) IBM also marks the 10th anniversary of its storage management software architecture in August. The company reports that its OEM Magnetoresistive (MR) Head business has shipped more than 50 million MR heads and 2.5 million giant MR heads since the business began in late 1996.

IBM's Lotus Notes seats number over 34 million, up from 2.2 million in 1995 when Lotus joined IBM. The company has more than 1 million DB2 licenses, nearly 40 million users worldwide and 11,000 corporate customers. IBM's CICS software processes more than 20 billion transactions a day or 260,000 transactions per second, and more than $100 billion in transactions per week, the same level as the NASDAQ market.

Among the software announcements during 1998 are: the expansion of the VisualAge 2000 portfolio of Year 2000 tools with unique Millennium Language Extensions and the new Application Testing Collection; the beginning of shipments of the IBM Suite for Windows NT and IBM Enterprise Suite for Windows NT, two software suites that make it easy for Windows NT users to build, deploy and manage business applications; several enhancements to the WebSphere application server product line; ViaVoice 98, the next generation of IBM's speech recognition software; new products and enhancements to the eNetwork Software family of host integration products; IBM MQSeries Workflow; the third release of the San Francisco application business components for Java; IBM Global Sign-On Version 2, software to eliminate the need for people using multiple systems to sign onto each one individually; and Tivoli Systems, Inc., announces the first release of TME 10 Output Manager, an output management solution for client/server production environments.

Online sales of IBM products reach $38 million a day in December.

IBM helps set new Internet records at the Nagano Olympic Winter Games in February. The official Nagano Web site, powered by IBM, registers an unprecedented total of nearly 650 million hits from around the world over the course of the 16-day event. (By comparison, the 1996 Atlanta Olympic Summer Games registered 187 million hits.) The *Guiness Book of Records* officially recognizes IBM for setting two world records in Internet traffic on the 1998 Nagano Olympic Winter Games Web site: "The Most Popular Internet Event Ever Recorded" and, with 110,414 hits, "The Most Hits On An Internet Site in One Minute."

For the fourth consecutive year, IBM and The All England Lawn Tennis Club collaborate to produce the official Wimbleton Web site, which records over 106 million page views and over 224 million server hits during the 1998 Championships. The official Web site of the 1998 French Open tennis championships, designed and hosted by IBM, is the most highly trafficked official Grand Slam Web site to date, recording 146.9 million server hits during the two-week tournament in June. Then in September, the official 1998 U.S Open Web site, powered by IBM for U.S. Tennis Association, records 382 million hits and 242 million page views during the two-week tournament.

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Other IBM e-business and network computing announcements during 1998 include: the industry's premier system security for conducting business over the Internet encompassing a hardware/software solution integrated with IBM's flagship enterprise operating system, OS/390, and IBM S/390 Parallel Enterprise servers - Generation 3 (G3) and Generation 4 (G4); Home Page Reader for Windows, a talking Web browser that opens the World Wide Web with spoken Internet access to blind and visually impaired users; a set of agreements by IBM, Security Dynamics Technologies, Inc. and RSA Data Security, Inc., to allow corporate users to more easily select and integrate security products providing features such as single sign-on, cryptography, authentication services and encryption for their networks; IBM eNetwork Law Enforcement Express, to extend the reach of host- and Web-based applications to the mobile patrol force by allowing law enforcement agencies to take advantage of available Internet and intranet information in real-time; eNetwork Firewall Version 3.2 for Windows NT and AIX, offering customers comprehensive firewall solutions to support their e-business initiatives; eNetwork On-Demand Server, software that makes it easier to deploy and use Web-based applications within an enterprise; the Electronic Expense Reporting Solution, an integrated, online expense processing tool; and the IBM Real Estate Solution, a complete technology package of hardware, software, Internet tools and digital imaging peripherals for real estate agents.

CBS News selects the IBM News Archive Application to manage the entire digital and physical assets of its vast broadcast archive, and the WB Television Network picks IBM to provide an integrated distribution and spot insertion solution for its WeB Division.

Among the other 1998 product announcements are: the 8239 Token-Ring Stackable Hub; expansion of the Ethernet networking product family; InfoPrint 20, a workgroup laser printer; the next generation of printing solutions, including InfoPrint Manager 3.1; the T55, the first sub-$1,000 15-inch active matrix Thin Film Transisitor flat panel monitor; three new flat panel monitors — Models 9516-B23, 9514-B03 and 9514-B23; G54 and G74 General Business Series monitors; the T85 18-inch active matrix Thin Film Transistor flat panel monitor; and the IdeaScan scanner.

IBM delivers in September the world's first copper-based microprocessors, including a PowerPC 740/750 operating at 400 MHz. Microprocessors that incorporate copper wiring boost chip performance by about one-third. IBM says it will incorporate copper into its S/390, RS/6000 and AS/400 server families.

IBM becomes the first company to introduce silicon germanium chip-making technology into mainstream manufacturing, offering the first SiGe-based standard products for use in wireless communications products such as cell phones and pagers. SiGe chips provide high performance and less power consumption with lower cost, helping to usher in new breeds of network appliance devices for personal communication.

IBM also introduces a faster, 300 MHz version of the PowerPC 750 microprocessor; the POWER microprocessor that performs like eight chips in one; four new single-chip MPEG-2 video

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encoders, which significantly expand IBM's family of professional digital video products; and new semiconductor packaging products that can help electronics manufacturers integrate more components onto a single microchip.

IBM wins more than $30 billion in new IBM Global Services (IGS) contracts. Of the 38 outsourcing contracts IBM signs in 1998 that are worth $100 million or more, nearly half are with customers outside the United States, more than double the percentage of two years ago. For example: the French insurance company GAN selects IBM to help deploy a worldwide satellite network connecting 1,000 of the company's general agents; eight Singapore government institutions and ministries award desktop outsourcing contracts worth more than S$16 million to IBM; Korean Airlines signs a 10-year, $120 million outsourcing contract with IGS; IGS and SC Johnson Wax establish a comprehensive global information technology (IT) alliance, including a 10-year, multi-million outsourcing contract for IGS to manage SC Johnson Wax's data center operations across Europe and to support manufacturing sites in the U.K. and Holland; Kao Corporation and IBM Japan, Ltd. sign a strategic outsourcing contract; Fiat and IBM announce a $175 million outsourcing relationship in Latin America; Equifax broadens its U.K. outsourcing contract with IBM with a new 10-year contract for $220 million; and Lend Lease extends its outsourcing agreement with IBM Global Services Australia in a $167 million, six-year contract extension.

Cable & Wireless Communications announce a 10-year, $3 billion strategic information technology partnership with IBM, the largest of its kind between a major communications company and a leading IT services provider. The Boeing Company awards IBM a comprehensive IT contract valued at more than $2 billion over five years. GE Capital Services and IBM announce their intent to enter into a long-term IT alliance, under which GE Capital will outsource its mainframe and midrange processing for its own businesses to IGS, and IBM will acquire the commercial data center outsourcing business of GE Capital Services Technology Management Services and serve its current external customers worldwide. The Hertz Corporation renews its five-year, $100 million-plus contract for a variety of IT services. Chiron Corporation and IBM establish a 10-year, $139 million IT outsourcing relationship.   IBM establishes a five-year, $110 million-plus partnership with Consolidated Freightways.

The company introduces IBM Security Services to help customers assess and improve security in their computing environments and IBM Distributed Learning Services, which help companies assess training needs and implement technology-based learning programs. Also announced is IBM Asset Services, an offering to help customers track, manage and control their multivendor desktop computers and software.

IBM and The Little Tikes Company introduce the *Young Explorer* fun and learning computer center — an all-in-one computing solution for early childhood centers, preschools, elementary schools, libraries. IBM will provide the computer and the educational software from its Edmark

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subsidiary; Little Tikes will manufacture the furniture components. In addition, IBM launches World Book multimedia software, the first in a series of DVD-ROM reference offerings for families.

Alliances
IBM says in April that it has become the first international provider of e-business services in China and the company announces major initiatives with China Telecom to jointly develop other technology-based operational solutions for China's telecommunications industry. Two months after that, IBM reports strategic agreements with the Chinese Ministry of Information Industry and key business partners to expand the development and use of e-business solutions, based on IBM's Network Computing Framework and Java technology, in China.

IBM and Dassault Systemes announce a new strategic alliance to deliver new integrated solutions in response to an emerging new market opportunity called Product Development Management II.

Groupe Bull and IBM extend their agreement to include development of PowerPC-based UNIX systems and the AIX operating system.

IBM and STMicroelectronics announce a joint effort to accelerate development of advanced system-on-a-chip products.

The company says that it has formed a partnership with Voice Control Systems, Inc., to marry the power of advanced speech recognition with the telephone.

Science & Technology
IBM Chairman Louis V. Gerstner, Jr., attends CeBit '98 in Hanover, Germany, in March, and provides IBM's first in-depth discussion of deep computing (emerging computer systems that combine ultrafast processing with sophisticated analytical software) and pervasive computing (tiny intelligent processing devices embedded in the global fabric of computing and communications) as important emerging technology trends and the natural extensions of networked computing.

For the sixth year in a row, IBM receives the most U.S. patents — 2,658 — which is 733 more than the number two company and 40 percent more than IBM won last year. IBM becomes the first company ever to break the 2,000 U.S. patent issuance barrier in a single year. IBM now owns more than 30,000 patents worldwide, including 14,000 in the United States. IBM has 2,900 researchers worldwide.

U.S. Vice President Al Gore announces Blue Pacific — the world's fastest computer — which is jointly developed by the U.S. Energy Department's Lawrence Livermore National Laboratory and IBM, can perform 3.9 trillion calculations per second (15,000 times faster than the average desktop computer) and has over 2.6 trillion bytes of memory (80,000 times more than the average PC).

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IBM perfects the Silicon-on-Insulator process for building high-speed transistors that enhance chip speed by up to 35 percent and reduce power requirements by up to 66 percent.

The company unveils an experimental microprocessor that operates at 1,000 megahertz or three times faster than the fastest Intel Pentium chip.

IBM Research engineers at the Austin Research Lab demonstrate the world's first experimental CMOS microprocessor that can operate at one billion cycles per second (1 GHz)
Scientists at the IBM Zurich Research Laboratory and the French National Center for Scientific Research discover "molecular wheels": propeller-shaped molecules that rotate rapidly in a bearing-like structure formed by surrounding molecules.

IBM provides the details of a collaboration between a team of scientists at its Thomas J. Watson Research Center and an eminent Renaissance art historian to reconstruct Michelangelo's (second) Pietá. The project, based on new computerized geometric three-dimensional modeling techniques that will make near-perfect digital replication of very large scale objects possible, will yield nearly two billion bits of data.

Facilities
IBM says it will spend more than $100 million on several major new initiatives, including expansion of the company's Burlington, Vt., facility for making "masks" — stencils used to transfer circuit designs onto actual chips.

The company also reports a $20 million expansion of its operations in China, with the unveiling of a new plant for manufacturing hard disk drive magnetoresistive (MR) heads. The plant willl be operated by the Shenzhen IBM Technology Products Co., Ltd., a new company which is fully-owned by IBM.

Motorola and IBM announce in June the transition of the Somerset PowerPC microprocessor design center in Austin, Texas, from joint ownership to becoming wholly-owned by Motorola. The Somerset facility opened in 1992 and has been jointly funded and staffed to support the development of products based on the PowerPC architecture.

IBM's Transarc subsidiary opens a new Customer Solutions Center in San Diego, Calif.

Corporate Citizenship
U.S. President Bill Clinton presents IBM Chairman Louis V. Gerstner, Jr., with the first Ron Brown Award for Corporate Leadership in recognition of the company's long-standing commitment to workforce diversity.

Speaking on behalf of the information technology industry at the OECD Ministerial Conference in Ottawa, Canada, IBM Chairman Louis V. Gerstner, Jr., delivers a major address on the policy and regulatory environment required for e-business.

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IBM announces in August a $1 million investment in Ireland's school system as part of its global Reinventing Education program. Ireland is the first European country to be selected as an IBM Reinventing Education partner. IBM's Reinventing Education initiative — which is recognized in a Harvard Business School case study as a model for corporate philanthropy in education — contributes more than $35 million to 15 school districts and six states in the United States alone, and is expanded in 1998 to include projects in Brazil, Canada, Columbia, India, Ireland, Italy and Vietnam.

IBM and the United Way of America launch the KidSmart Early Learning Program, a project to install computer learning centers in more than 1,000 nonprofit preschool sites across the United States.

As part of its $3.5 million commitment to support the development of Internet2, IBM announces the names of seven higher education institutions that will receive resources through the company's sponsored research program. Donated resources will be in the form of hardware, software, switches and other pieces of network infrastructure critical to Internet2 applications, connections and operation.

The City of Oakland (Calif.), IBM and Bridge West Oakland Housing, Inc. announce a $1.2 million plan to install a computer training facility in a public housing development — including network stations in each apartment — so that welfare and low-income residents can learn critical job skills in their own homes.

IBM establishes a computer training center in Novi Sad, the capital of the northern province Vojvodina, in the Federal Republic of Yugoslavia, to train refugees of the region who lost their homes during the war.

Individual employees in the United States give $43.9 million through matching grants and donations to nonprofit organizations and educational institutions. IBMers volunteer four million hours of service to local causes, from tutoring youngsters in math and science to teaching PC skills to single parents. IBM dedicates $116 million to benefit people in need.

IBM increases the number of women executives by 18 percent and the number of minority executives by more than 15 percent in the United States.

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Business Performance
IBM revenue reaches $83.33 billion, up seven percent over 1998, and net earnings are $7.7 billion, a 22 percent increase over the prior year. There are 307,401 employees and 646,702 stockholders at year's end.

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Organization

IBM and Sequent Computer Systems announce a merger agreement under which IBM will sell Sequent's product line worldwide and integrate Sequent technologies into IBM products. The merger supports IBM's strategy to deliver leadership solutions for e-businesses, emerging "NetGen" companies and UNIX and NT customers. Sequent then becomes a wholly-owned subsidiary of IBM.

IBM says that Whistle Communications, Inc., the industry's leading manufacturer of "thin server" products, will become a wholly-owned subsidiary, an acquisition that will strengthen IBM's ability to help small companies set up comprehensive Web capabilities and provide Internet access and e-mail services to multiple employees, all through a single Internet connection.

IBM acquires Mylex Corporation, a leading developer of technology for moving, storing, protecting and managing data in desktop and networked environments as a wholly-owned subsidiary. The acquisition strengths IBM's efforts to deliver "one-stop shopping" to storage customers in the OEM market and will broaden IBM's data storage offerings.

Products & Services

The company rolls out the S/390 G6 Server as the world's most powerful commercial enterprise server. The S/390 Parallel Enterprise Server - Generation 6 is the first enterprise server to use IBM's innovative copper chip technology, and extends customers' ability to handle millions of e-business workload transactions and large-scale enterprise resource planning applications. The S/390 G6 family's largest system can deliver more than 1,600 MIPS capacity.

IBM launches the next generation of its RS/6000 SP supercomputer with POWER3 microprocessors that more than double its number-crunching power at approximately the same price. The POWER3 can perform up to two billion operations per second and is more than twice as powerful as the POWER2 Super Chip inside IBM's "Deep Blue," the computer that beat world chess champion Garry Kasparov in 1997.

The National Center for Atmospheric Research in Boulder, Colo., takes delivery of an IBM RS/6000 SP that will accelerate researchers' abilities to simulate global climate patterns. The new RS/6000 SP — code-named "blackforest" — is five times larger and 20 times more powerful than the system made famous during Deep Blue's historic 1997 victory over world chess champion Garry Kasparov.

IBM becomes the leading vendor in the field of high performance computing. More universities, government laboratories and businesses use IBM supercomputers (RS/6000 SPs) than those of any other manufacturer on the "TOP500 Supercomputing Sites" list.

IBM launches the IBM Enterprise Storage Server — code-named "Shark" — a new generation of enterprise disk storage systems. Shark is the most scaleable storage system in the world (from 420 GB to 11 TB), and it provides the fastest throughput of any storage system in the world. Pitney Bowes Inc. becomes the first company to take delivery of a production level machine.

IBM announces support for Linux, the open-source operating system, becoming the only company to provide complete solutions of hardware, software and technical support for Linux.

IBM, the company that defined ultraportable computer design with such milestones as the ThinkPad 701C with a fold-out "butterfly" keyboard, unveils the ThinkPad 570 as its next-generation ultraportable PC. This powerful notebook PC is the first of a new breed of "transformer" systems that instantly converts from an all-in-one, desktop-replacement notebook PC into a thin and light ultraportable.

IBM announces the computer industry's first desktop PC equipped with speech recognition technology for small and growing businesses. The IBM PC 300GL Small Business Series features ViaVoice, speech recognition software designed to deliver simplicity and naturalness in speech dictation and voice control via the computer system.

IBM introduces two new high-performance hard drive models: the 36-gigabyte Ultrastar 36ZX — which can hold the equivalent of 1,188 feet of shelved books — and the Ultrastar 18LZK with the fastest seek time (4.9 msec) of any hard drive in the industry.

The company also launches a Deskstar 37GP as the world's highest capacity hard disk drive for desktop PCs. It can hold the equivalent text of a stack of paper four times higher than New York's World Trade Center or seven full-length feature films.

IBM begins shipping the IBM 340 megabyte microdrive, the world's smallest hard disk drive. Designed for use in digital cameras and small PCs, the microdrive has a disk platter the size of a large coin and weighs less than a AA battery.

Later, the company announces the Travelstar 25GS, the world's highest capacity notebook PC hard drive, holding four times as much data as the average notebook hard drive. It also has the highest rpm of any notebook PC hard drive. Introduced at the same time is the Travelstar 12GN, the most rugged hard drive available anywhere.

The Ultrastar 72ZX is unveiled as the world's highest capacity server-class hard drive, holding the equivalent of a floor of books at the New York Public Library in a drive the size of a paperback novel.

IBM reaches a major milestone in shipping its one-millionth copper PowerPC chip, just one year after shipping its first copper chip. IBM's copper PowerPC processors are helping to fuel the company's growth as a major OEM supplier to makers of networking gear. At the same time, IBM introduces the copper-based PowerPC 440, the industry's highest performance embedded

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processor to date, which can be used to boost the flow of traffic in the routers, hubs and switches that power networks like the Internet.

Alliances

IBM and Dell Computer Corporation announce a $16 billion technology pact, the largest agreement of its kind in the information technology industry. As part of the agreement, Dell will purchase storage, microelectronics, networking and display technology from IBM for integration into Dell computer systems. In the future, the agreement is expected to include IBM's copper, silicon-on-insulator and other advanced technologies.

Later, IBM and EMC Corporation announce a five-year strategic technology and business alliance valued at $3 billion, which significantly expands an existing business relationship between the two industry leaders and will benefit many of IBM's and EMC's mutual customers. Under the terms of the accord, EMC will continue to purchase advanced IBM disk drives for incorporation into EMC's Symmetrix Enterprise Storage systems.

IBM completes a strategic agreement with Ford Motor Company to provide application development — including a unique Accelerated Solutions Center (ASC) — and deployment services to reduce time-to-market and yield worldwide cost efficiencies. At the ASC, IBM is to support up to 150 concurrent application projects in such areas as distribution, finance, human resources, marketing and sales, manufacturing and product development.

Lotus Development Corp. and IBM join with leading academic institutions to form the Institute for Knowledge Management. This initiative is the first of its kind for the information technology industry, and offers corporate enterprises and organizations the first opportunity to access the world's largest information base on Knowledge Management structures and applications.

IBM becomes the first corporate partner approved to connect to Abilene, a new high-speed network of leading research universities in the United States. Through Abilene, IBM researchers will collaborate with Internet2 research institutions on the development of advanced Internet applications that will enable IBM customers to exploit the full potential of e-business.

Science & Technology

For the seventh consecutive year, IBM is awarded the most U.S. patents. Awarded a record 2,756 of the patents issued by the U.S. Patent and Trademark Office in 1999, IBM tops the next closest company by more than 900 patents, for a total of more than 15,000 during the 1990s.

Among the inventions for which IBM is awarded U.S. patents in 1999 are: a method and apparatus for performing computer-based on-line commerce using an intelligent agent; a system for ordering items over a computer network using an electronic catalog; fundamental improvements to the Silicon-on-Insulator chip manufacturing process; and a means for significantly reducing the stresses on chip packaging caused by different thermal expansion rates.

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IBM scientists achieve a major advance in semiconductor technology by combining both logic and memory circuits on a single piece of silicon. This breakthrough can significantly enhance the performance of many electronic products, from personal computers to cell phones and video games, while reducing the number of chips inside and making the products smaller and less expensive.

IBM announces a $100 million research initiative to build "Blue Gene," a supercomputer 500 times more powerful than the fastest computers today and about two million times more powerful than today's top desktop PCs. Blue Gene will consist of more than one million processors capable of more than one quadrillion operations per second (one petaflop). That kind of speed and power will help scientists to model the folds of human proteins — which control all cellular processes in the body — to gain better insights into diseases and ways to control them.

IBM's S/390 G5 Server sets a new record for Internet performance, posting a rating of 21,591 hits per second — a 50 percent increase over the previous record.

IBM researchers set a world record by sorting one trillion bytes of data in 17 minutes, about one-third the time of the previous record of 50 minutes. The sorting benchmark tests the efficiency of a computer's input-output management and internode communication rather than pure calculating power. The achievement illustrates IBM's commitment to providing its e-business customers with the ability to speed processing and manage valuable data.

An IBM RS/6000 S80 almost doubles the best Java performance claim to date and sets a world record for Web serving, while a cluster of five 12-way RS/6000 S70 Advanced Enterprise Servers set a new world record for transaction processing by clustered servers, surpassing all other computer makers in a key computing criteria used to evaluate both system performance and availability. Later in the year, an IBM RS/6000 S80 Enterprise Server sets a new world record for transaction processing performance by a single-server system.

IBM's high-performance network routing products set a new record — more than 1,000 transactions per second — in a high-demand environment requiring extremely fast responses. In tests conducted by independent consultants, IBM's high-performance routing products processed transactions up to 77 percent faster than similar offerings from Cisco Systems.

Company researchers and engineers set a new world record in hard-disk storage density, writing and reading data bits so small that an unprecedented 35.3 billion of them would fit within a square inch. The new record density is a 75 percent increase over the 20-billion-bit milestone IBM achieved earlier in the year and is expected to lead to disk drives that could store three times more information than those available today.

The IBM S/390 CMOS Cryptographic Coprocessor chip — a key product for providing secure e-business — receives the U.S. government's highest certification for commercial security. To

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date, IBM offers the only two products to achieve a Federal Information Processing Standard 140-1 Level 4 certification.

IBM establishes the Deep Computing Institute, a $29 million research initiative that will bring together experts in academia and industry to address some of the world's most challenging business and scientific problems. Deep computing combines massive computation and very sophisticated software algorithms to attack problems previously beyond information technology. The Institute is headquartered at IBM's Thomas J. Watson Research Center in Yorktown Heights, N.Y.

Facilities
IBM announces plans to create the IBM Design Center for e-transaction processing, a 10,500-foot facility in Poughkeepsie, N.Y., where customers can explore the leading edge of e-commerce and develop new approaches to e-business.

Corporate Citizenship
IBM introduces the IBM IntelliStation E Pro — the world's first personal computer to be made from 100 percent recycled resin for all plastic parts. IBM's integration of recycled plastics in new system production is unmatched in the computer industry and demonstrates IBM's technological leadership in introducing products that satisfy both the customer's requirements for features and price, and are environmentally conscious.