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Internet: An Overview of Key Technology Policy Issues Affecting Its Use and Growth

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Internet: An Overview of Key Technology Policy Issues Affecting Its Use and Growth

Summary

The growth of the Internet may be affected by a number of issues being debated by the 107th Congress. This report summarizes several key technology policy issues under consideration.

1. Individuals and businesses considering whether to use the Internet are increasingly concerned about **Internet privacy**, particularly the privacy of personally identifiable information collected by Web site operators. Congress is debating whether industry self-regulation will solve these problems, or if legislation is needed.

2. Concerns about **computer security** are prevalent both in the government and private sectors. Concerns have also been raised about the vulnerability of the nation's critical infrastructures (e.g. electrical power supply) to cyber attacks. Issues for the 107th Congress include oversight and improvement of the protection of federal computer systems and cooperation with and between the private sectors.

3. **Broadband Internet access** gives users the ability to send and receive data at speeds far greater than current Internet access over traditional telephone lines. With deployment of broadband technologies beginning to accelerate, Congress is seeking to ensure fair competition and timely broadband deployment to all sectors and geographical locations of American society.

4. Since the mid-1990s, commercial transactions on the Internet—called **electronic commerce (e-commerce)**—have grown substantially. Among the many issues facing congressional policymakers are encryption procedures to protect e-commerce transactions, whether the 3-year tax moratorium on domestic e-commerce taxation should expire or be extended, and how the policies of the European Union (EU) and World Trade Organization (WTO) may affect U.S. e-commerce activities.

5. Unsolicited commercial electronic mail (UCE), or "**junk e-mail**" or "spam," aggravates many computer users because it is a nuisance and the cost may be passed on to consumers through higher charges from Internet service providers who must upgrade their systems to handle the traffic. Proponents of UCE insist it is a legitimate marketing technique and protected by the First Amendment.

6. The administration and governance of the **Internet's domain name system** (DNS) is currently under transition from federal to private sector control. The 107th Congress is likely to examine how the Department of Commerce is managing and overseeing this transition in order to ensure competition and promote fairness among all Internet constituencies.

7. The growing role of the Internet in the political economy of the United States will likely attract attention in the 107th Congress. Three major themes may characterize legislative activity and interest: Internet infrastructure development, resource management, and the provision of online services by the government (called **"e-government"**).

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Introduction

The continued growth of the Internet for personal, government, and business purposes may be affected by a number of issues being debated by Congress. Among them are Internet privacy, computer security, access to broadband (high-speed) services, electronic commerce (e-commerce), unsolicited commercial electronic mail ("junk e-mail" or "spam"), Internet domain names, and government information technology management. Lists of pending legislation, acronyms, related legislation passed in the 105th and 106th Congresses, and other CRS reports that provide more detail on the issues, are included as appendices.

Internet Privacy[1]

Internet privacy issues encompass a range of concerns that the Internet makes it easier for governmental and private sector entities to obtain information about consumers and possibly use that information to the consumers' detriment. The two major issues today are the extent to which Web site operators collect personally identifiable information and share that information with third parties, and whether law enforcement entities or employers are monitoring electronic mail (e-mail) and Web surfing activities. Although not an Internet privacy issue per se, consumer identity theft often arises in the Internet privacy context because of the perception that Social Security numbers and credit card numbers are more readily accessible because of the Internet.

More than 30 bills in the 106th Congress addressed such Internet privacy issues in whole or in part.[2] The only legislation that cleared Congress and was signed into law, however, were amendments to the FY2001 Transportation Appropriations Act (P.L. 106-346) and the FY2001 Treasury-General Government Appropriations (including in the Consolidated Appropriations Act, P.L. 106-554) addressing the use of "cookies"on certain federal agency Web sites. The 107th Congress is expected to

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[1] CRS Report RS20035, *Internet Privacy—Protecting Personal Information: Overview and Pending Legislation*, by Marcia S. Smith, provides an overview of Internet privacy issues and tracks pending legislation. It is updated more frequently than this report. CRS Report RL30784, *Internet Privacy: An Analysis of Technology and Policy Issues*, by Marcia S. Smith, provides more comprehensive analysis of the issues involved in this debate.

[2] For a list of the 106th Congress Internet privacy bills, see Appendix B of CRS Report RL30784, *Internet Privacy: An Analysis of Technology and Policy Issues*.

continue to have a strong interest in Internet privacy issues. Medical records privacy and financial records privacy are not Internet privacy issues. For information on those topics, see CRS Report RS20500, *Medical Records Privacy: Questions and Answers on the December 2000 Federal Regulation*, and CRS Report RS20185, *Privacy Protection for Customer Financial Information*, respectively.

Collection of Data by Web Site Operators and Fair Information Practices

Perhaps the most often discussed Internet privacy issue is whether commercial Web sites should be required to adhere to four "fair information practices" proposed by the Federal Trade Commission (FTC): providing *notice* to users of their information practices before collecting personal information, allowing users *choice* as to whether and how personal information is used, allowing users *access* to data collected and the ability to contest its accuracy, and ensuring *security* of the information from unauthorized use. In particular, the question is whether industry can be relied upon to regulate itself, or if legislation is needed to protect consumer privacy. Questions also have arisen about whether federal government Web sites should have to adhere to such practices. CRS Report RL30784, *Internet Privacy: An Analysis of Technology and Policy Issues*, provides more detailed information on fair information practices in the Internet context.

Commercial Web Sites. The FTC has been very active on Internet privacy issues for several years. Based on a series of surveys of commercial Web sites each year since 1997, the FTC has issued reports and made recommendations about whether legislation is needed to protect consumer privacy on the Web. Although the FTC and the Clinton Administration favored self regulation, in 1998, frustrated at industry's slow pace, the FTC announced that it would seek legislation protecting children's privacy on the Internet by requiring parental permission before a Web site could request information about a child under 13. The Children's Online Privacy Protection Act (COPPA, part of P.L. 105-277) was enacted four months later.

In 1999, the FTC concluded that further legislation was not needed at that time for children or adults, but reversed its decision in 2000 when another survey indicated that industry still was not self regulating to the desired extent. The FTC voted 3-2 to propose legislation that would allow it to establish regulations requiring Web site operators to follow the four fair information practices. The close vote underscored the controversial nature of the FTC's reversal of position, which was further illuminated at a Senate Commerce Committee hearing on May 25, 2000.

The Internet industry has taken steps to demonstrate that it can self regulate. One example is the formation of the Online Privacy Alliance (OPA), a group of more than 80 companies and associations in the Internet business. OPA developed a set of privacy guidelines and its members are required to adopt a privacy policy, post it on their site(s), and implement the policy. Another is the establishment of "seals" for Web sites by the Better Business Bureau, TRUSTe, and WebTrust. To display a seal from one of those organizations, a Web site operator must agree to abide by certain privacy principles (some of which are based on the OPA guidelines), a complaint resolution process, and to being monitored for compliance. Advocates of self

regulation argue that these seal programs demonstrate industry's ability to police itself. Advocates of further legislation argue that while the seal programs are useful, they do not carry the weight of law, limiting remedies for consumers whose privacy has been violated. They also point out that while a site may disclose its privacy policy, that does not necessarily equate to having a policy that protects privacy.

Federal Web Sites. Until the summer of 2000, attention was focused on privacy issues associated with commercial Web sites. That changed in June 2000, however, when controversy erupted over the privacy of visitors to government Web sites. Dubbed "Cookiegate" in the press, the issue concerned federal agencies' use of computer "cookies"(small text files placed on users' computers when they access a particular Web site) to track activity at their Web sites. Federal agencies had been directed by President Clinton and the Office of Management and Budget (OMB) to ensure that their information collection practices adhere to the Privacy Act of 1974. In June 2000, however, the Clinton White House announced that it had just learned that contractors for the Office of National Drug Control Policy (ONDCP) had been using cookies to collect information about those using ONDCP's Web site during an anti-drug campaign wherein users clicking on anti-drug ads on various Web sites were taken to an ONDCP site. Cookies then were placed on users' computers to count the number of users, what ads they clicked on, and what pages they viewed on the ONDCP site. The White House directed ONDCP to cease using cookies, and OMB issued a memorandum reminding agencies to post and comply with privacy policies and detailing the limited circumstances under which agencies should collect personal information.

Congress reacted to the overall concern about federal agency information practices on Web sites by adding language concerning such activities by departments and agencies funded in the FY2001 Treasury-General Government Appropriations Ac, commonly called the "Treasury-Postal Act." The language is contained both in the FY2001 Treasury-Postal Appropriations Act itself, and in the FY2001 Transportation Appropriations Act. Section 501 of the FY2001 Transportation Appropriations Act (P.L. 106-346) prohibits funds in the FY2001 Treasury-General Government Appropriations Act from being used by any federal agency to collect, review, or create aggregate lists that include personally identifiable information (PII) about an individual's access to or use of a federal Web site or enter into agreements with third parties to do so, with exceptions. Section 646 of the FY2001 Treasury-General Government Appropriations Act, as included in the FY2001 Consolidated Appropriations Act (P.L. 106-554), requires Inspectors General of agencies or departments covered in that appropriations act to report to Congress within 60 days of enactment (which occurred on December 21, 2000) on activities by those agencies or departments relating to collection of PII about individuals who access any Internet site of that department or agency, or entering into agreements with third parties to obtain PII about use of government or non-government Web sites. Although the language affects only departments and agencies funded under the FY2001 Treasury-Postal Appropriations Act, Congress may decide to place such language in other appropriations acts in the future if its concerns are not alleviated. Some argue that the 1974 Privacy Act, coupled with OMB directives, is sufficient and additional legislation is not needed, however.

Monitoring of E-Mail and Web Activity

Another Internet privacy storm broke in the summer of 2000 when it became known that the FBI, with a court order, installs software on Internet Service Providers' equipment to intercept e-mail and monitor an individual's Web activity. Called Carnivore, the extent to which that software program can differentiate between e-mail and Web activity involving a subject of an FBI investigation and other people's e-mail and Web activity is of considerable debate, with critics claiming that Carnivore violates the privacy of innocent users. A House Judiciary subcommittee held a hearing on Carnivore on July 24, 2000. Legislation that would have, *inter alia,* required law enforcement to report on its use of e-mail intercepts was discussed at a September 6, 2000 Senate Judiciary hearing. No legislation cleared the 106th Congress, however. The 107th Congress is expected to further examine FBI activities in monitoring e-mail and Web activities, especially the use of Carnivore or its successors.

An emerging issue is whether employers should be required to notify their employees if e-mail or other computer-based activities are monitored. While many agree that employers should be able to monitor the use of equipment they own by individuals they employ, the question is whether employees must be notified first.

Consumer Identity Theft and Protecting Social Security Numbers

The widespread use of computers for storing and transmitting information is thought by some to be contributing to consumer identity theft, in which one individual assumes the identity of another using personal information such as credit card and Social Security numbers. Government agencies report sharply increasing numbers of consumer identity theft cases, but whether the Internet is responsible is debatable. Some attribute the rise instead to carelessness by businesses in handling personally identifiable information, and by credit issuers that grant credit without proper checks. The FTC has a toll free number (877-ID-THEFT) to help victims of identity theft.

Although not related directly to whether Social Security numbers are more accessible because of the Internet, it should be noted that the 105th Congress passed the Identity Theft and Assumption Deterrence Act (P.L. 105-318). That Act sets penalties for persons who knowingly, and with the intent to commit unlawful activities, possess, transfer, or use one or more means of identification not legally issued for use to that person. Also, the 106th Congress passed the Social Security Number Confidentiality Act (P.L. 106-433, H.R. 3218) which prohibits the display of SSNs on unopened checks or other Treasury-issued drafts. Furthermore, the 106th Congress passed the Internet False Identification Act (P.L. 106-578), which updates existing law against selling or distributing false IDs to include those sold or distributed through computer files, templates, and disks.

Two bills have been introduced in the 107th Congress: H.R. 91 (Frelinghuysen), the Social Security Online Privacy Protection Act, and H.R. 220 (Paul), the Identity Theft Protection Act.

Computer Security

As use of the Internet grows, so has concern about security of and on the Internet. Widespread media attention to recent security-related incidents (such as the distributed denial of service attacks against Yahoo, eBay, and other major on-line sites in February 2000 or the worldwide spread of the Love Bug virus) represent the tip of the iceberg. Every day, persons do, or try to, gain access to someone else's computer without authorization to read, copy, modify, or destroy the information contained within. These persons range from juveniles, to disgruntled (ex)employees, to criminals, to competitors, to politically or socially motivated groups, to agents of foreign governments.

The extent of the problem is unknown. Not every person or company whose computer system has been compromised reports it either to the media or to authorities. Sometimes the victim judges the incident not to be worth the trouble. Sometimes the victim may judge that the adverse publicity would be worse. Sometimes the affected parties don't even know their systems have been compromised.

There is some evidence to suggest, however, that the number of affected people is increasing. According to the Computer Emergency Response Team (CERT) at Carnegie-Mellon University, the number of incidents reported to it has grown every year since its establishment— growing from 132 incidents in 1989 to 9,859 incidents in 1999. In just the first half of 2000, 8,836 incidents were reported. The Computer Security Institute (CSI), in cooperation with the Federal Bureau of Investigation (FBI), has conducted an annual survey since 1996. For those responding to the question of whether they have experienced unauthorized use of their computer systems in the last 12 months, the percentage answering yes has risen from 42% in 1996 to 70% in 2000.[3]

The impact on society from the unauthorized access or use of computers is also unknown. Again, some victims may choose not to report losses. In many cases, it is difficult or impossible to quantify the losses. But, social losses are not zero. Trust in one's system may be reduced. Proprietary and/or customer information (including credit card numbers) may be compromised. Any unwanted code must be found and removed. The veracity of the system's data must be checked and restored if necessary. Money may be stolen from accounts or extorted from the victim. If disruptions occur, sales may be lost. If adverse publicity occurs, future sales may be lost and stock prices may be affected. Estimates of the overall financial losses due to unauthorized access vary and their reliability is untested. Estimates typically range in the billions of dollars per major event like the Love Bug virus or the denial-of-service attacks in February 2000. Estimates of losses internationally range up to the tens of billions of dollars. The reliability of these estimates is a matter of some debate. Those

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[3]The CSI/FBI survey is not a scientific sampling of the nation's computer systems. Surveys are sent to computer security practitioners in U.S. corporations and government agencies. In 2000, 643 surveys were sent out. In 2000, 585 respondents answered the question about unauthorized use.

able and willing to estimate financial losses in the 2000 CSI/FBI survey estimated a total of $266 million in losses in previous 12 months.[4]

Aside from the losses discussed above, there is also growing concern that unauthorized access to computer systems could pose an overall national security risk should they result in the disruption of the nation's critical infrastructures (e.g. transportation systems, banking and finance, electric power generation and distribution). These infrastructures rely increasingly on computer networks to operate, and are themselves linked by computer and communication networks. To address this concern, President Clinton issued a Presidential Decision Directive (PDD-63) in May 1998. PDD-63 set as a national goal the ability to protect critical infrastructures from intentional attacks (both physical and cyber) by 2003. It set up organizational and operational structures within the federal government to help achieve this goal and calls for a coordinated effort to engage the private sector. See CRS Report RL30153, *Critical Infrastructures: Background and Early Implementation of PDD-63*).

As a deterrent, the federal computer fraud and abuse statute, 18 U.S.C. 1030, makes it a federal crime to gain unauthorized access to federal government computers, to be exposed to certain information contained on government computers, to damage or threaten to damage federal computers, bank computers, or computers used in interstate commerce, to traffic in passwords for these computers, to commit fraud from these computers, or from accessing a computer to commit espionage. The statute also provides for penalties. For more information on this statute, see CRS Report 97-1025, *Computer Fraud and Abuse: An Overview of 18 U.S.C. 1030 and Related Federal Criminal Laws*. Most states also have laws against computer fraud and abuse. Many experts believe these statutes are sufficient to prosecute most if not all unauthorized access incidents that have occurred to date. Even so, a number of bills were introduced in the second session of the 106th Congress to increase the federal penalties associated with these crimes. While many experts agree that the statutes are sufficient for prosecution, many also suggest that the ability to follow the electronic trail of a hacker across jurisdictional lines is procedurally difficult. Some of the same bills introduced last Congress to address penalties also sought to apply or modify current trap and trace rules to trail perpetrators on-line.

At the international level, the 41-country Council of Europe is negotiating a treaty to facilitate tracking cyber criminal across national boundaries. The latest draft of the treaty was released in December 2000. A discussion of the draft can be found on the Council's web page [http://conventions.coe.int/treaty/EN/cadreprojets.htm]. There is also some debate within the international community about what to do about computer intrusions by government agents. For example, whether such acts would be considered acts of war. For more information regarding this issue see CRS Report RL30735, *Cyberwarfare*.

The federal government is required to protect sensitive information on its own computers. The Computer Security Act of 1987 authorizes the National Institute of

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[4]74% of the survey respondents acknowledged financial losses; 42% of them could quantify those losses.

Standards and Technology (NIST) to develop standards to be used by agencies to protect non-national security oriented computers (the National Security Agency does the same for classified information and national security systems) and requires agencies to develop and implement security programs and plan to protect the information on their computers. The Paperwork Reduction Act of 1995 gives OMB the responsibility to oversee the development and implementation of computer security standards, programs, and plans. OMB offers agencies guidance on how to meet their requirements with OMB Circular A-130, Appendix III.

The General Accounting Office (GAO) has found that federal agencies are not consistently good at protecting certain computer systems (typically those used in financial management).[5] GAO has concluded that part of the problem is that there is not a strong government wide oversight. As part of the FY2001 Defense Authorization Act (P.L. 106-398), Congress passed the Federal Information Security Reform Act. The Act puts into statute much of OMB Circular A-130 guidance. It also strengthens oversight by requiring agencies to have independent reviews of their security programs and plans annually and to report the results of those reviews to OMB. In turn, OMB is to report to Congress on the results.

The security of private computer systems varies. Some industries have been at the forefront of security (e.g. banking and finance), while others are just now appreciating the threat to and vulnerabilities of their systems. The market for computer and Internet security is large and growing. The CSI/FBI survey cites a 1999 International Data Corporation (IDC) estimate that the security software industry will grow from $2 billion to $7.4 billion by 2003 and the security hardware market will grow from $500 million to $1.9 billion by 2003. According to Redherring.com (Picking the Locks on the Internet Security Market, [www.Redherring.com], July 24, 2000), the security services market is expected to grow from $7 billion to $14 billion by 2003. Operating systems and applications developers are paying greater attention to designing better security into their products. But still, it is common to have vulnerabilities found in products after they have been put on the market. There are as yet no set industry standards for how secure an industry's systems should be or for assessing how secure they are in fact. However, there is a push by the major accounting houses and liability firms to make corporate leaders and boards more accountable for their firms information assets. The federal government, in cooperation with a number of other countries, has developed a set of International Common Criteria for Information Technology Security Evaluation, to allow certified laboratories to test security products and rate their level of security for government use. These criteria may evolve into industry standards for certifying security products.

Also, in response to PDD-63 some of the sectors that operate critical infrastructures have formed Information Sharing and Analysis Centers (ISACs) and across sectors they have formed the Partnership for Critical Infrastructure Security.

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[5]U.S. General Accounting Office, *Information Security. Serious Weaknesses Place Critical Federal Operations and Assets at Risk*. GAO/AIMD-98-92. Sept. 1998.

A number of issues will confront the 107th Congress during its first session. Congress will continue to oversee agencies' performance in meeting their obligations under the Computer Security Act, OMB Circular A-130 and now the Federal Information Security Reform Act. Also, Congress may wish to inquire about the Bush Administration's intentions to reaffirm or modify President Clinton's policies and structures regarding critical infrastructure protection. Congress may also revisit procedures and penalties associated with investigating and prosecuting computer crimes. Finally, Congress may face questions about how to strike a balance between its efforts to promote Internet privacy and Internet security. While one cannot protect privacy without security, there are some who fear that without proper checks, efforts to promote security could come at the expense of privacy.

Broadband Internet Access[6]

Broadband Internet access gives users the ability to send and receive data at speeds far greater than conventional "dial up" Internet access over existing telephone lines. New broadband technologies—cable modem, digital subscriber line (DSL), satellite, and fixed wireless Internet—are currently being deployed nationwide by the private sector. Concerns in Congress have arisen that while the number of new broadband subscribers continues to grow, the rate of broadband deployment in urban and high income areas appears to be outpacing deployment in rural and low-income areas, thereby creating a potential "digital divide" in broadband access. The Telecommunications Act of 1996 authorizes the Federal Communications Commission (FCC) to intervene in the telecommunications market if it determines that broadband is not being deployed to all Americans in a "reasonable and timely fashion."

At issue is what, if anything, should be done at the federal level to ensure that broadband deployment is timely, that industry competes on a level playing field, and that service is provided to all sectors of American society. Currently, the debate in Congress centers on three approaches. Those are: 1) compelling cable companies to provide "open access" to competing Internet Service Providers (ISPs); 2) easing certain legal restrictions and requirements (imposed by the Telecommunications Act of 1996) on incumbent telephone companies that provide high-speed data (broadband) access; and 3) providing federal financial assistance for broadband deployment in rural and economically disadvantaged areas. Hearings on broadband access in the 106th Congress were held by a number of congressional committees, including House Commerce, House Judiciary, Senate Commerce, and Senate Judiciary. No broadband legislation was enacted during the 106th Congress.

Open Access. Legislation introduced in the 106th Congress sought to compel cable companies that provide broadband access to give "open access" to all ISPs. In effect, the legislation would have enabled cable broadband customers to subscribe to their ISP of choice without first going through their cable provider's ISP. At issue is whether cable networks should be required to share their lines with, and

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[6]See also CRS Issue Brief IB10045, *Broadband Internet Access: Background and Issues*, by Lennard G. Kruger and Angele A. Gilroy, which is updated more frequently than this report.

give equal treatment to, rival ISPs who wish to sell their services to consumers. Supporters argue that open access is necessary to prevent cable companies from creating "closed networks," limiting access to content, and stifling competition. Opponents of open access counter that an open access mandate would inhibit the cable industry's ongoing nationwide investment in broadband technology, and assert that healthy competition does and will exist in the form of alternate broadband technologies such as DSL and satellites.

The arguments for and against open access have been heard on the local level, as cities, counties, and states have taken up the issue of whether to mandate open access requirements on local cable franchises. In June 1999, a federal judge ruled that the city of Portland, OR, had the right to require open access to the Tele-Communications Incorporated (TCI) broadband network as a condition for transferring its local cable television franchise to AT&T. AT&T appealed the ruling to the U.S. Court of Appeals for the Ninth Circuit. On June 22, 2000, the Court ruled in favor of AT&T, thereby reversing the earlier ruling. The court ruled that high-speed Internet access via a cable modem is defined as a "telecommunications service," and not subject to direct regulation by local franchising authorities.

The debate thus moves to the federal level, where many interpret the Court's decision as giving the FCC authority to regulate broadband cable services as a "telecommunications service." However, the FCC also has the authority *not* to regulate if it determines that such action is unnecessary to prevent discrimination and protect consumers. To date, the FCC has chosen *not* to mandate open access, citing the infancy of cable broadband service and the current and future availability of competitive technologies such as DSL and satellite broadband services. However, in light of the June 22 court decision, the FCC announced, on June 30, 2000, that it will conduct a formal proceeding to determine whether or not cable-Internet service should be regulated as a telecommunications service, and whether the FCC should mandate open access nationwide. On September 28, 2000, the FCC formally issued a Notice of Inquiry (NOI) which will explore whether or not the Commission should require access to cable and other high- speed systems by ISPs.

Meanwhile, recent developments within the cable industry could have an impact on the open access debate. On January 10, 2000, AOL announced plans to merge with Time Warner, Inc. Now approved by the federal government, the merger gives AOL access to the second largest cable television system in the United States, and a share in Roadrunner, one of the two major cable modem ISPs. On December 14, 2000, the FTC announced its approval of the AOL Time Warner merger with conditions. Under the terms of the proposed consent order, AOL Time Warner is required to open its cable systems to competing ISPs, and prohibited from interfering with the content passed along the bandwidth contracted for by non-affiliated ISPs. On January 11, 2001, the FCC announced its approval of the merger with additional conditions intended to promote open access.

Easing Restrictions and Requirements on Incumbent Telephone Companies. Legislation introduced into the 106th Congress sought to ease certain legal restrictions and requirements imposed by the Telecommunications Act of 1996 on ILECs (incumbent local exchange companies such as BellSouth or Verizon). Included among the proposed legislative remedies were allowing Bell operating

companies (BOCs) to offer data services across local access and transport area (LATA) boundaries, and easing requirements for ILECs to share (via unbundling and resale) their high speed networks with competing companies.

Those supporting these provisions, primarily the BOCs, claim they are needed to promote the deployment of broadband services, particularly in rural and underserved areas. Present regulations contained in the 1996 Telecommunications Act, they claim, are overly burdensome and discourage needed investment in broadband services. ILECs, they state, are the only entities likely to provide such services in low volume rural and other under served areas. Therefore, proponents state, until present regulations are removed the development and the pace of deployment of broadband technology and services, particularly in unserved areas, will be lacking. Furthermore, supporters state, domination of the Internet backbone market is emerging as a concern and entrance by ILECs (particularly the BOCs) into this market will ensure that competition will thrive with no single or small group of providers dominating. Additional concerns that the lifting of restrictions on data would remove BOC incentives to open up the local loop to gain interLATA relief for voice services are also unfounded, they state. The demand by consumers for bundled services and the large and lucrative nature of the long distance voice market will, according to proponents, provide the necessary incentives for BOCs to seek relief for interLATA voice services.

Opponents, including long distance companies and non-incumbent local exchange companies (those competing with the ILECs to provide local service), claim that lifting such restrictions and requirements will undermine the incentives needed to ensure that the ILECs will open up their networks to competition. Present restrictions, opponents claim, were built into the 1996 Telecommunications Act to help ensure that competition will develop in the provision of telecommunications services. Modification of these regulations, critics claim, will remove the incentives needed to open up the "monopoly" in the provision of local services. Competitive safeguards such as unbundling and resale are necessary, opponents claim, to ensure that competitors will have access to the "monopoly bottleneck" last mile to the customer. Therefore, they state, the enactment of this legislation to modify these regulations will all but stop the growth of competition in the provision of local telephone service. A major change in existing regulations, opponents claim, would not only remove the incentives needed to open up the local loop but would likely result in the financial ruin of providers attempting to offer competition to the ILECs. As a result, consumers will be hurt, critics claim, since the hoped for benefits of competition such as increased consumer choice and lower rates will never emerge. Concern over the inability of regulators to distinguish between the provision of voice only and data services if such restrictions are lifted has also been expressed. Opponents also dismiss arguments that BOC entrance into the marketplace is needed to ensure competition. The marketplace, opponents claim, is a dynamic and growing one, and concerns over the lack of competition and market dominance are misplaced.

Federal Assistance for Broadband Deployment. The 106th Congress considered (but did not enact) legislation that would have provided financial support for broadband deployment, especially in rural and low-income areas. Bills were introduced into the 106th Congress which sought to provide assistance for broadband deployment through mechanisms such as: tax credits for investment in broadband

facilities, support from the FCC's universal service fund, and loans from the Rural Utilities Service (RUS) of the Department of Agriculture. Broadband tax credit bills (S. 88, Rockefeller; S. 150, Kerry) have been introduced into the 107th Congress. For more information on federal assistance for broadband deployment, see CRS Report RL30719, *Broadband and the Digital Divide: Federal Assistance Programs.*

Electronic Commerce[7]

Background

The convergence of computer and telecommunications technologies has revolutionized how we get, store, retrieve, and share information. Many contend that this convergence has created the Information Economy, driven by the Internet, and fueled a surge in U.S. productivity and economic growth. Commercial transactions on the Internet, whether retail business-to-customer or business-to-business, are commonly called electronic commerce, or "e-commerce."

Since the mid-1990s, commercial transactions on the Internet have grown substantially.[8] By 1996, Internet traffic, including e-commerce, was doubling every 100 days. By mid-1997, the U.S. Department of Commerce reported that just over 4 million people were using e-commerce; by the end of 1997, that figure had grown to over 10 million users. The rate of e-commerce growth continues so rapidly that projections often are outdated as fast as they are published. One 1998 industry estimate projected that U.S. retail transactions would reach $7 billion by 2000 — a figure now widely accepted as having been reached in *the year the report came out.* Still, reliable industry sources report huge jumps in e-commerce transactions, particularly during fourth quarter holiday shopping. It is also important to note that in 2000, even with an economic slowdown and with many new "dot-com" businesses no longer in existence, e-commerce continued to grow. The Jupiter Media Group released a report in January 2001 that states that in 2000, e-commerce grew to $10 billion, compared to $7 billion in 1999, and that during the 2000 holiday season about 36 million consumers purchased on-line and spent an average of $304, both increases over 1999 numbers.

Internationally, there are issues regarding Internet use and e-commerce growth. While the western industrialized nations dominate Internet development and use, by the year 2003 more than half of the material posted on the Internet will be in a language other than English. This has large ramifications for e-commerce and ease of transactions, security, and privacy issues. Policymakers, industry leaders, academicians, and others are concerned that this development will not correlate with

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[7] See also CRS Report RS20426, *Electronic Commerce: An Introduction*, by Glenn J. McLoughlin, which is updated more frequently than this report.

[8] For statistics and other data on e-commerce, sources include: [http://www.idc.com], [http://www.abcnews.go.com], [http://www.forrester.com], [http://earmarketer.com], and [http://www.cs.cmu.edu]. It is important to note that some measurements of e-commerce, particularly that data reported in the media, have not been verified.

equal access to the Internet for many in developing nations—therefore creating a global "digital divide." The United States and Canada represent the largest percentage of Internet users, at 56.6%. Europe follows with 23.4%. At the end of 1999, of approximately 180 million Internet users worldwide, only 3.1% are in Latin America, 0.5% are in the Middle East, and 0.6% are in Africa. The Asian Pacific region has 15.8% of all Internet users; but its rate of growth of Internet use is nearly twice as fast as the United States and Canada.

The E-Commerce Industry

Even with some concern about accuracy and timeliness of e-commerce statistics, reliable industry sources report huge jumps in e-commerce transactions, particularly during fourth quarter holiday shopping. But long-term, industry growth has not been limited to just holiday shopping. According to a study undertaken by the University of Texas, the Internet portion of the U.S. economy grew at a compounded rate of 174% from 1995-1998 (the U.S. gross domestic product grew at 2.8% during the same period), and e-commerce accounted for one-third of that growth. Increasingly, many firms use "vortals"—vertically integrated portals or gateways that advertise or provide information on a specific industry or special interest. As a portion of e-commerce business, vortals provide targeted advertising for e-commerce transactions, and may grow from 35% of all e-commerce advertising to 57% by 2004. However, not all firms providing these services are profitable; in fact, most have yet to turn a profit.

One of the fastest growing sectors of e-commerce is business-to-business transactions–what is often called "B2B." The Forrester Group, a private sector consulting firm, estimates that by 2003, that sector of the U.S. economy will reach $1.5 trillion, up from nearly $200 billion in 2000. Business-to-business transactions between small and medium sized businesses and their suppliers is rapidly growing, as many of these firms begin to use Internet connections for supply chain management, after-sales support, and payments.

The Clinton Administration

The Clinton Administration advocated a wide range of policy prescriptions to encourage e-commerce growth. These included calling on the World Trade Organization (WTO) to declare the Internet to be a tax-free environment for delivering both goods and services; recommending that no new tax policies be imposed on Internet commerce; stating that nations develop a "uniform commercial code" for electronic commerce; requesting that intellectual property protection—patents, trademarks, and copyrights—be consistent and enforceable; that nations adhere to international agreements to protect the security and privacy of Internet commercial transactions; that governments and businesses cooperate to more fully develop and expand the Internet infrastructure; and that businesses self-regulate e-commerce content.

The Clinton Administration's "The Emerging Digital Economy" (April 1998), "The Emerging Digital Economy II" (June 1999), "Digital Economy 2000" (June 2000), and "Leadership for the New Millennium, Delivering on Digital Progress and

Prosperity" (January 2001) provided overarching views on domestic and global e-commerce. These reports provide data on the explosive growth of e-commerce, its role in global trade and national Gross Domestic Product (GDP), and contributions that computer and telecommunications technology convergence is making to productivity gains in the United States and worldwide. The Administration also argued that the effects that information technologies have had on raising national productivity, lowering inflation, creating high wage jobs, and contributing up to one-third of all domestic growth in the 1990s.

Issues for the Bush Administration and the 107th Congress

Since the mid-1990s, Congress also has taken an active interest in the e-commerce issue. Among many issues, Congress may revisit policies that establish federal encryption procedures and will likely examine extending or letting expire the 3-year tax moratorium on domestic e-commerce taxation. In addition, congressional policymakers are looking at the European Union (EU) and WTO policies and regulations in e-commerce.

Protection and Security Issues. There are a variety of protection and security issues that affect e-commerce growth and development. *Encryption* is the encoding of electronic messages to transfer important information and data, in which "keys" are needed to unlock or decode the message. Encryption is an important element of e-commerce security, with the issue of who holds the keys at the core of the debate. Until 1998, the Clinton Administration promoted the use of strong (greater than 56 bits) encryption domestically and abroad only if encrypted product had "key recovery" features in which a "key recovery agent" holds a "spare key" to decrypt the information. Under this policy, the Clinton Administration tried to use export control policy to influence companies to develop key recovery encryption products. There was no control over domestic use of encrypted products, but the Clinton Administration hoped that companies would not want to develop two sets of encrypted products, one for the United States and another for the rest of the world. However, businesses and consumer groups opposed this approach. For many U.S. businesses, the Clinton Administration export policy had the potential to impede their efforts to become part of the growing e-commerce global phenomena by forcing them to create two versions of the same product. Consumer groups opposed government policies determining who would have access to spare keys.

In September 1999, the Clinton Administration announced plans to further relax its encryption export policy by allowing export of unlimited key length encryption products, with some exceptions. The Administration also reduced reporting requirements for those firms that export encrypted products. The rules for implementing this policy were issued in September 2000 by the Bureau of Export Administration in the Department of Commerce. While this new policy appears to have addressed both industry and consumer concerns, many policymakers in the 107th Congress will likely maintain a key interest in this issue, both in the way it affects e-commerce and how the government may use its encryption policy as a form of government surveillance. (See CRS Issue Brief IB96039, *Encryption Technology: Congressional Issues*, for more information.)

In a related area, the 106th Congress considered and passed legislation establishing standards for transmission and verification of electronic transmissions. *Electronic signatures* are a means of verifying the identity of a user of a computer system to control access to, or to authorize, a transaction. The main congressional interests in electronic signatures focus on enabling electronic signatures to carry legal weight in place of written signatures, removing the inconsistencies among state policies that some fear may retard the growth of e-commerce, and establishing federal government requirements for use of electronic signatures when filing information electronically. Neither federal law enforcement nor national security agencies oppose these objectives, and most U.S. businesses would like a national electronic signatures standard to further enhance e-commerce. When President Clinton signed into law the Electronic Signatures in Global and National Commerce Act (P.L. 106-229), the process of developing a national electronic signature standards was begun. Among its many provisions, this law also establishes principles for U.S. negotiators to follow for setting global electronic signatures policies. (See CRS Report RS20344, *Electronic Signatures: Technology Development and Legislative Issues*, for more information.)

E-Commerce Taxation. Congress passed the Internet Tax Freedom Act on October 21, 1998, as Titles XI and XII of the Omnibus Consolidated and Emergency Supplemental Appropriations Act of 1999 (P.L. 105-277, 112 Stat 2681). Among its provisions, the Act imposes a 3-year moratorium on the ability of state and local governments to levy certain taxes on the Internet; it prohibits taxes on Internet access, unless such a tax was generally imposed and actually enforced prior to October 1, 1998; it creates an Advisory Commission on Electronic Commerce (ACEC), which may make recommendations to Congress on e-commerce taxation in the United States and abroad; and it opposes regulatory, tariff, and tax barriers to international e-commerce and asks the President to pursue international agreements to ban them. (See CRS Report RL30667, *Internet Tax Legislation: Distinguishing Issues,* for more information.)

The ACEC made its policy recommendations, after much debate and some divisiveness, to Congress on April 3, 2000. The ACEC called for, among its recommendations, extending the domestic Internet tax moratorium for five more years, through 2006; prohibiting the taxation of digitized goods over the Internet, regardless of national source; and a continued moratorium on any international tariffs on electronic transmissions over the Internet. On May 18, 2000, the House of Representatives passed H.R. 3709, the Internet Nondiscrimination Act, which extends the domestic tax moratorium for five additional years beyond October 1, 2001. This legislation was not acted upon in the Senate; the issue is expected to be revisited in the 107th Congress.

The EU and WTO. While much of the debate on the government's role in e-commerce has focused on domestic issues in the United States, two important players—the EU and the WTO—will likely have an important impact on global e-commerce policy development. The EU is very active in e-commerce issues. In some areas there is agreement with U.S. policies, and in some areas there are still tensions. While the EU as an entity represents a sizable portion of global Internet commerce, across national boundaries, Internet use and e-commerce potential varies widely. Supporters state that e-commerce policy should not be set by EU bureaucrats

in Brussels. Therefore, the EU has approached e-commerce with what one observer has called a "light regulatory touch." Among contentious issues, the EU has supported the temporary moratorium on global e-commerce taxes, and supports making the moratorium permanent. But the EU has taken a different approach than U.S. policy by treating electronic transmissions (including those that deliver electronic goods such as software) as services. This position would allow EU countries more flexibility in imposing trade restrictions, and would allow treating electronic transmissions—including e-commerce — as services, making them subject to EU value-added duties. The EU also has taken a different approach to data protection and privacy, key components for strengthening e-commerce security and maintaining consumer confidence. Recent EU actions prohibit the transfer of data in and out of the EU, unless the outside country provides sufficient privacy safeguards. The U.S. position has been to permit industry self-regulation of data protection and privacy safeguards. (For more information on the European data directive, see CRS Report RL30784, *Internet Privacy: An Analysis of Technology and Policy Issues.*)

The WTO has presented another set of challenges to U.S. policymakers. The first two WTO ministerial meetings addressed issues that have an impact on e-commerce. The first WTO Ministerial conference was held in Singapore on December 9-13, 1996. Among the issues considered by the WTO participants was an agreement to reduce trade barriers for information technology goods and services. This issue was considered vital to the development of telecommunications infrastructure–including the Internet–among developing nations. A majority of participants signed an agreement to reduce these barriers. At the second WTO Ministerial conference, held in Geneva on May 18 and 20, 1998, an agreement was reached by the participating trade ministers to direct the WTO General Council to develop a work program on electronic commerce and to report on the progress of the work program, with recommendations, at the next conference. The ministers also agreed that countries continue the practice of not imposing tariffs on electronic transmissions. Since then, e-commerce taxation and Internet access issues have been proposed for future discussion at WTO ministerial meetings. (See CRS Report RS20319, *Telecommunications Services Trade and the WTO Agreement* and CRS Report RS20387, *The World Trade Organization (WTO) Seattle Ministerial Conference).*

Unsolicited Commercial Electronic Mail ("Junk E-Mail" or "Spam")[9]

One aspect of increased use of the Internet for electronic mail (e-mail) has been the advent of unsolicited commercial e-mail (UCE), also called junk e-mail, spam, or unsolicited bulk e-mail. The *Report to the Federal Trade Commission of the Ad-Hoc Working Group on Unsolicited Commercial Email* [http://www.cdt.org/spam] reviews the issues in this debate.

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[9]See also CRS Report RS20037, *"Junk E-Mail": An Overview of Issues and Legislation Concerning Unsolicited Commercial Electronic Mail ("Spam")*, by Marcia S. Smith, which is updated more frequently than this report.

In 1991, Congress passed the Telephone Consumer Protection Act (P.L. 102-243) that prohibits, *inter alia*, unsolicited advertising via facsimile machines, or "junk fax" (see CRS Report RL30763, *Telemarketing: Dealing with Unwanted Telemarketing Calls*). Many question whether there should be an analogous law for computers, or at least some method for letting a consumer know before opening an e-mail message whether or not it is unsolicited advertising and to direct the sender to cease transmission of such messages. At a November 3, 1999 hearing of the House Commerce telecommunications subcommittee, a representative of SBC Internet Services, a subsidiary of SBC Communications, Inc., stated that 35% of all the e-mail transmitted over SBC's Internet systems in its Pacific Bell and Southwestern Bell regions is UCE.

Opponents of junk e-mail such as the Coalition Against Unsolicited Commercial Email (CAUCE) argue that not only is junk e-mail annoying, but its cost is borne by consumers, not marketers. Consumers are charged higher fees by ISPs that must invest resources to upgrade equipment to manage the high volume of e-mail, deal with customer complaints, and mount legal challenges to junk e-mailers. According to the May 4, 1998 issue of Internet Week [http://www.techweb.com/se/directlink.cgi?INW19980504S0003], $2 of each customer's monthly bill is attributable to spam. Some want to prevent bulk e-mailers from sending messages to anyone with whom they do not have an established business relationship, treating junk e-mail the same way as junk fax. Proponents of unsolicited commercial e-mail argue that it is a valid method of advertising. The Direct Marketing Association (DMA), for example, argues that instead of banning unsolicited commercial e-mail, individuals should be given the opportunity to notify the sender of the message that they want to be removed from its mailing list—or "opt-out." In January 2000, the DMA launched a new service, the E-mail Preference Service, where any of its members that send UCE must do so through a special Web site where consumers who wish to "opt out" of receiving such mail can register themselves [http://www.e-mps.org]. Each DMA member is required to check its list of intended recipients and delete those consumers who have opted out. While acknowledging that the service will not stop all spam, the DMA considers it "part of the overall solution" [http://www.the-dma.org/aboutdma/release4.shtml]. Critics argue that most spam does not come from DMA members, so the DMA plan is insufficient.

To date, the issue of restraining junk e-mail has been fought primarily over the Internet or in the courts. Some ISPs will return junk e-mail to its origin, and groups opposed to junk e-mail will send blasts of e-mail to a mass e-mail company, disrupting the company's computer systems. Filtering software also is available to screen out e-mail based on keywords or return addresses. Knowing this, mass e-mailers may avoid certain keywords or continually change addresses to foil the software, however. In the courts, ISPs with unhappy customers and businesses that believe their reputations have been tarnished by misrepresentations in junk e-mail have brought suit against mass e-mailers.

Although several bills were debated in both the 105th and 106th Congresses, no legislation cleared Congress. Some states are passing their own legislation. According to the National Conference of State Legislatures, as of March 2000, 15 states had enacted such laws and 16 introduced spam bills during their 2000 legislative sessions.

The 107th Congress remains interested in the issue at the federal level. H.R. 95 (Green), the Unsolicited Commercial Electronic Mail Act, was introduced the day the 107th Congress convened.

Internet Domain Names[10]

The 107th Congress continues to monitor issues related to the Internet domain name system (DNS). Internet domain names were created to provide users with a simple location name for computers on the Internet, rather than using the more complex, unique Internet Protocol (IP) number that designates their specific location. As the Internet has grown, the method for allocating and designating domain names has become increasingly controversial.

The Internet originated with research funding provided by the Department of Defense Advanced Research Projects Agency (DARPA) to establish a military network. As its use expanded, a civilian segment evolved with support from the National Science Foundation (NSF) and other science agencies. No formal statutory authorities or international agreements govern the management and operation of the Internet and the DNS. Prior to 1993, NSF was responsible for registration of nonmilitary generic Top Level Domains (gTLDs) such as .com, .org, and .net. In 1993, the NSF entered into a 5-year cooperative agreement with Network Solutions, Inc. (NSI) to operate Internet domain name registration services. With the cooperative agreement between NSI and NSF due to expire in 1998, the Administration, through the Department of Commerce (DOC), began exploring ways to transfer administration of the DNS to the private sector.

In the wake of much discussion among Internet stakeholders, and after extensive public comment on a previous proposal, the DOC, on June 5, 1998, issued a final statement of policy, *Management of Internet Names and Addresses* (also known as the "White Paper"). The White Paper stated that the U.S. government was prepared to recognize and enter into agreement with "a new not-for-profit corporation formed by private sector Internet stakeholders to administer policy for the Internet name and address system." On October 2, 1998, the DOC accepted a proposal for an Internet Corporation for Assigned Names and Numbers (ICANN). On November 25, 1998, DOC and ICANN signed an official Memorandum of Understanding (MOU), whereby DOC and ICANN agreed to jointly design, develop, and test the mechanisms, methods, and procedures necessary to transition management responsibility for DNS functions to a private-sector not-for-profit entity.

The White Paper also signaled DOC's intention to ramp down the government's Cooperative Agreement with NSI, with the objective of introducing competition into the domain name space while maintaining stability and ensuring an orderly transition. During this transition period, government obligations will be terminated as DNS responsibilities are transferred to ICANN. Specifically, NSI committed to a timetable for development of a Shared Registration System that permits multiple registrars to

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[10]See also CRS Report 97-868, *Internet Domain Names: Background and Policy Issues*, by Lennard G. Kruger, which is updated more frequently than this report.

provide registration services within the .com, .net., and .org gTLDs. To date, 152 companies have either been accredited as a registrar by ICANN, or have qualified for accreditation; currently, 70 registrars are operational. NSI will continue to administer the root server system until receiving further instruction from the government.

Significant disagreements between NSI on the one hand, and ICANN and DOC on the other, arose over how a successful and equitable transition would be made from NSI's previous status as exclusive registrar of .com, org. and net. domain names, to a system that allows multiple and competing registrars. On September 28, 1999, after nearly a year of negotiations, DOC, NSI, and ICANN announced a series of formal agreements. NSI agreed to sign an accreditation agreement with ICANN, but with certain limits and conditions placed on ICANN decisions that could affect NSI's business. While the agreement was hailed by DOC, NSI, and ICANN, opposition was voiced by competing registrars, who asserted that the agreement gives NSI too many advantages in the competition for new registrations and renewals of existing ones. Others objected to the limits placed on ICANN with regard to making decisions that might affect NSI. At its November 1999 board meeting, ICANN agreed to modifications of the agreement which addressed some of the concerns raised. On November 10, 1999, ICANN, NSI, and DOC formally signed the agreements.

On September 4, 2000, ICANN and the DOC agreed to extend their MOU until September 30, 2001 or sooner, if both parties agree that the work set under the MOU has been completed. Remaining tasks, many of which are underway, include: creating new Internet top-level domains, completing selection of the ICANN Board of Directors, enhancing the architecture of the root-name server system, formalizing contractual relationships between ICANN and the regional Internet Protocol address registries, and establishing stable arrangements between ICANN and the organizations responsible for the operation of country-code Top-Level Domains (TLDs).

Until the full transition to a private sector-controlled DNS system is completed, the DOC remains responsible for monitoring the extent to which ICANN satisfies the principles of the White Paper as it makes critical DNS decisions. Congress remains keenly interested in how the Administration manages and oversees the transition to private sector ownership of the DNS. The conference report (H.Rept. 106-479) accompanying the FY2000 Consolidated Appropriations Act (P.L. 106-113, signed November 29, 1999) directed GAO to review the legal basis and authority for DOC's relationship with ICANN (including the possible transfer of the authoritative root server to private sector control), the possibility of shifting federal oversight responsibilities from NTIA to the National Institute of Standards and Technology (NIST), and the adequacy of existing security arrangements safeguarding critical hardware and software underlying the DNS. The GAO report, released on July 7, 2000, concluded that the DOC does have legal authority to enter into its current agreements and cooperative activities with ICANN. GAO noted that while it is unclear whether DOC has the authority to transfer control of the authoritative root server to ICANN, the Department has no current plans to do so.

Two key issues addressed by ICANN are the addition of new top level domains and the election of At-Large Board members. At its July 16, 2000 meeting in

Yokohama, the ICANN Board of Directors adopted a policy for the introduction of new TLDs. Additional TLDs could significantly expand the number of domain names available for registration by the public. The policy involves a process in which those interested in operating or sponsoring new TLDs may apply to ICANN. During September 2000, a total of 47 applications were received. At its November 16, 2000 annual meeting, ICANN selected seven companies or organizations to operate a registry for one of seven new TLDs, as follows: .biz, .aero, .name, .pro, .museum, .info, and .coop. ICANN's selections are subject to approval by the Department of Commerce. Following contractual discussions between ICANN and selected applicants, at least some of the new TLDs could become operational during the first half of 2001. Meanwhile, ICANN's selection of new TLDs has proven controversial. The House Energy and Commerce Committee has announced plans to hold hearings in February 2001 to explore whether the process was open and fair, and whether it ultimately promotes competition in registration and assignment of Internet domain names.

Regarding the composition of ICANN's board of directors, ICANN by law calls for an international and geographically diverse 19-member board of directors, composed of a president, nine at-large members, and nine members nominated by three Supporting Organizations representing Domain Name, Address, and Internet Protocol constituencies. During October 1999, the three Supporting Organization each selected three directors for the permanent board. Terms of service range from one to three years. Of the nine directors, four are from Europe (Britain, France, Netherlands, and Spain), two from Canada, one from Mexico, one from Hong Kong, and one from the United States. The nine new directors joined the ten sitting interim directors, who serve until an additional nine directors are elected to the permanent board by ICANN's At-Large membership. At ICANN's March 2000 meeting in Cairo, the sitting board agreed to a plan whereby five At-Large board members, one from each of five geographic regions of the world, would be directly elected by Internet users. Eligible to vote was anyone over 16 years old with an active email and postal address who registered as an ICANN member. On October 10, 2000 ICANN announced the five new At-Large board members elected by over 34,000 Internet users. At the November 2000 annual meeting, ICANN initiated a study to determine how to select the remaining At-Large board members. Meanwhile, the sitting board has extended the terms of four of its interim members until 2002 to serve with the five newly elected At-Large board members.

Another issue surrounding the DNS is the resolution of trademark disputes that arise in designating domain names. In the early years of the Internet, when the primary users were academic institutions and government agencies, little concern existed over trademarks and domain names. As the Internet grew, however, the fastest growing number of requests for domain names were in the .com domain because of the explosion of businesses offering products and services on the Internet. Since domain names have been available from NSI on a first-come, first-serve basis, some companies discovered that their name had already been registered. The situation was aggravated by some people (dubbed "cybersquatters") registering domain names in the hope that they might be able to sell them to companies that place a high value on them.

The increase in conflicts over property rights to certain trademarked names has resulted in a number of lawsuits. Under previous policy, NSI did not determine the legality of registrations, but when trademark ownership was demonstrated, placed the use of a name on hold until the parties involved could resolve the domain name dispute. The White Paper called upon the World Intellectual Property Organization (WIPO) to develop a set of recommendations for trademark/domain name dispute resolutions, and to submit those recommendations to ICANN. At ICANN's August 1999 meeting in Santiago, the board of directors adopted a dispute resolution policy to be applied uniformly by all ICANN-accredited registrars. Under this policy, registrars receiving complaints will take no action until receiving instructions from the domain-name holder or an order of a court or arbitrator. An exception is made for "abusive registrations" (i.e. cybersquatting and cyberpiracy), whereby a special administrative procedure (conducted largely online by a neutral panel, lasting 45 days or less, and costing about $1000) will resolve the dispute. Implementation of ICANN's Domain Name Dispute Resolution Policy commenced on December 9, 1999. Meanwhile, the 106th Congress took action, passing the Anticybersquatting Consumer Protection Act (incorporated into P.L. 106-113, the FY2000 Consolidated Appropriations Act). The Act gives courts the authority to order the forfeiture, cancellation, and/or transfer of domain names registered in "bad faith" that are identical or similar to trademarks. The bill also provides for statutory civil damages of at least $1,000, but not more than $100,000, per domain name identifier.

Government Information Technology Management[11]

The growing role of the Internet in the political economy of the United States has attracted increased congressional attention to government information technology management issues. Interest has been further heightened by national information infrastructure development efforts and e-government initiatives. Although wide-ranging, government information technology management issues can be characterized by three major themes: infrastructure development, resource management, and the provision of online services (e-government). Each of these is likely to be addressed by the 107th Congress.

Internet Infrastructure and National Policy

Since 1995, when the Internet first came into prominence, the question of who should maintain and expand the U.S. information infrastructure has been raised by many policymakers. The Clinton Administration articulated its support of federal technology policy in the 1992 campaign, including the rapid expansion of telecommunications-based "information superhighways." Again, during the 1996 presidential campaign, President Clinton and Vice President Gore contended that investment in advanced technology would strengthen the U.S. economy by creating jobs and address pressing social problems. Early in the Clinton Administration, several policy proposals were presented to Congress that articulated a vision of how telecommunication technologies, services, and applications could be combined in a

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[11] See also CRS Report RL30661, *Government Information Technology Management: Past and Future Issues (the Clinger-Cohen Act)*, by Jeffrey W. Seifert.

national information network. This concept was to interconnect businesses, governments, researchers, educators, and the general public with advanced telecommunications networks and a diverse multitude of information resources.

Until the 106th Congress, most policymakers tended to respond to the Clinton Administration's policies, rather than provide a specific policy or program alternative. However, in the 106th Congress, several Members of Congress presented their approaches to support a national information infrastructure that would enable all Americans to access information and communicate with each other using voice, data, image or video at anytime, anywhere. Among these legislative initiatives was the Networking and Information Technology Research Development Act (H.R. 2086, Sensenbrenner), which would have doubled existing federal computing research programs, including developing new Internet-related technologies, over a five year period. While this bill was not passed by Congress, this and other legislative initiatives reflected greater congressional interest in addressing those areas of Internet research and development not currently undertaken by U.S. industry, but might be vital to the Internet's future growth.

Information Technology R&D. For FY2001, most federal Internet research and development is part of a large government effort to support a wide range of related scientific research and technology development. This is called the Information Technology (IT) Research and Development initiative, and includes a wide range of programs, from software upgrades at federal agencies to high performance computing developments. The total funding for federal IT Research & Development in FY2001 is $2.1 billion. The National Science Foundation received a significant increase in its IT research and development budget, going from $90 million in FY2000 to $215 million in FY2001. The Department of Energy has the largest federal IT research and development budget, at $657 million, which includes both civilian and defense IT efforts. Finally, an important component of the federal IT Research and Development initiative is the Next Generation Internet (NGI) program. The NGI is a multi-agency effort to develop new Internet research and applications that will assist federal agencies which have research and development as one of their missions. For FY2001, the six federal agencies in the NGI program will receive a total of $89 million.

Information Resource Management—The Role of a Federal CIO

Debate over the creation of a federal Chief Information Officer (CIO) position has ebbed and flowed in Congress over the past five years. In private sector organizations with a CIO, this person serves as the senior decisionmaker providing leadership and direction for information resource development, procurement, and management with a focus on improving efficiency and the quality of services delivered. Creating a federal CIO position was originally considered in an early draft of what became the Clinger-Cohen Act in 1995 (P.L. 104-106), but the idea was dropped in favor of creating CIO positions within individual executive brand agencies. The CIO Council was later established in 1996 by Executive Order 13011 as a forum for agency CIOs and Deputy CIOs to share information and improve government information resource management practices. The mixed results of agency-level CIOs, combined with a growing interest in better managing government technology

resources, brought renewed attention to creating a single federal CIO position, or a "national CIO," during the 106th Congress. In addition, the recent piecemeal efforts to move governmental functions and services online has led some observers to call for an "e-government czar" or a national CIO to coordinate these efforts.

Although there appears to be a growing bipartisan consensus regarding the need for a federal CIO, issues such as the organizational location and the scope of responsibility are still the subject of debate. The placement of the federal CIO is perhaps the most hotly contested issue. Specifically, there is disagreement over whether the federal CIO should be placed in the Office of Management and Budget (OMB) or if a new office should be established within the White House to focus solely on information technology issues. In September 2000, the House Government Reform Committee's Subcommittee on Government Management, Information, and Technology held a hearing regarding two bills proposed by Representatives Turner and Davis earlier that summer (discussed below). Much of the testimony focused on the relationship between the proposed federal CIO and the OMB. Then-Deputy Director of Management at OMB, Sally Katzen, argued that situating oversight of information technology management within OMB's management and budgeting authority was essential for the successful budgeting and execution of information technology programs. In response, critics of this approach argued that IT programs are crucial enough to warrant autonomous management and budget authority by specialists who can devote their full energy to the success of government IT projects. Some observers suggest there are lessons to be learned from the lackluster results of the agency-level CIO provisions in the Clinger-Cohen Act. In reviews of this provision, the GAO has cited the divided attention of agency-level CIOs with multiple spheres of responsibility as an obstacle for implementing information technology management reforms. The GAO has further stated that the role of the CIO is a full-time leadership position requiring complete attention to information resource management issues.[12]

Another issue that has received less attention is the scope of responsibility of the proposed federal CIO. Specifically, questions have been raised about oversight of government information security. Some proponents suggest that the federal CIO should be empowered to develop and implement a comprehensive response to information security threats. Critics of this approach argue that individual agencies may believe they have a reduced obligation or will devote fewer resources to information security at a time when threats to information resources are climbing.

During the 106th Congress, legislation was introduced in the House calling for the establishment of a federal CIO position. One bill (H.R. 4670, Turner) would have created a federal CIO in an office outside of OMB, establish a CIO Council by law rather than by executive order, and make the CIO head of the Council. A second bill (H.R. 5024, Davis) would have created a White House Office of Information Policy to be headed by a federal CIO, with a broad mandate to create federal IT policy, a

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[12]General Accounting Office, *Chief Information Officers: Ensuring Strong Leadership and an Effective Council*, GAO-T-AIMD-98-22, 27 October 1997. General Accounting Office, *VA Information Technology: Improvements Needed to Implement Legislative Reforms*, GAO/AIMD-98-154, 7 July 1998.

staff, an authorized budget to carry out the duties of a federal CIO, and the power to coordinate and execute government-wide information security efforts. Neither bill was passed in the last Congress; however, it is likely these issues will be revisited in the 107th Congress.

In addition to this congressional activity, during the 2000 Presidential campaign both major-party candidates proposed creating a federal CIO. It has since been reported in *Government Executive* magazine that Senator Lieberman is expected to introduce such a bill sometime this year while President Bush may issue an executive order designating the Deputy Director of the OMB as the federal CIO to coordinate government-wide e-government initiatives.

Provision of Online Services (E-government)

Electronic government (e-government) is an evolving concept, meaning different things to different people. However, it has significant relevance to four important areas of governance: (1) delivery of services (government-to-citizen, or G2C); (2) providing information (also G2C); (3) facilitating the procurement of goods and services (government-to-business, or G2B, and business-to-government, or B2G); and (4) facilitating efficient exchanges within and between agencies (government-to-government, or G2G). For policymakers concerned about e-government, a central issue is developing a comprehensive but flexible strategy to coordinate the disparate e-government initiatives across the federal government. Just as the private sector is undergoing significant change due, in part, to the convergence of technology, these same forces are transforming the public sector as well. E-government initiatives vary significantly in their breadth and depth from state to state and agency to agency.

So far, states such as California, Minnesota, and Utah have taken the lead in developing e-government initiatives. However, there is rapidly increasing interest and activity at the federal level as well. Perhaps the most well-known federal example is the September 2000 launch of the FirstGov web site [http://www.firstgov.gov]. FirstGov is a web portal designed to serve as a single locus point for finding federal government information on the Internet. The FirstGov site also provides access to a variety of state and local government resources. Another example is the Social Security Administration (SSA), which has also launched a number of e-government initiatives including the option to apply for retirement insurance benefits online, request a Social Security Statement, and the ability to request a replacement Medicare card. At the Department of the Treasury, the U.S. Mint is using interactive Internet sales to expand its marketing efforts and attract younger people into coin collecting. Similarly, the General Services Administration (GSA) recently created a new website, FedBizOpps [http://www.fedbizopps.gov] to facilitate federal business opportunities online.

The movement to put government online raises as many issues as it provides new opportunities. Some of these issues include, but are not limited to: security, privacy, management of governmental technology resources, accessibility of government services (including "digital divide" concerns as a result of a lack of skills or access to computers, discussed earlier), and preservation of public information (maintaining comparable freedom of information procedures for digital documents as exist for paper documents). Although these issues are neither new nor unique to e-

government, they do present the challenge of performing governance functions online without sacrificing the accountability of or public access to government that citizens have grown to expect. Some industry groups have also raised concerns about the U.S. government becoming a publicly funded market competitor through the provision of fee-for-services such as the U.S. Postal Service's eBillPay, which allows consumers to schedule and make payments to creditors online [http://www.usps.com/ebpp/welcome.htm].

Appendix A: Legislation in the 107th Congress

Following is a topical list of legislation pending before the 107th Congress on the issues covered in this report. The status of the legislation is not provided. For information on legislative status, congressional readers should consult LIS or Thomas, or contact CRS.

Format: Bill Number, Sponsor, Title, Date Introduced, Committee(s) to Which Bill Was Referred

Internet Privacy

H.R. 89, Frelinghuysen, Online Privacy Protection Act, 1/3/01 (Energy&Commerce)
H.R. 91, Frelinghuysen, Social Security Online Privacy Protection Act, 1/3/01 (Energy & Commerce)
H.R. 112, Holt, Electronic Privacy Protection Act, 1/3/01 (Energy & Commerce)
H.R. 220, Paul, Identity Theft Prevention Act, 1/3/01 (Ways & Means, Government Reform)
H.R. 237, Eshoo, Consumer Internet Privacy Enhancement Act, 1/20/01 (Energy & Commerce)

S. 197, Edwards, Spyware Control and Privacy Protection Act, 1/29/01 (Commerce)

Broadband Internet Access

S. 88, Rockefeller, Broadband Internet Access Act of 2001, 1/22/01 (Finance)
S. 150, Kerry, Broadband Deployment Act of 2001, 1/23/01 (Finance)

Junk E-Mail

H.R. 95, Green, Unsolicited Commercial Electronic Mail Act, 1/3/01 (E&C, Judiciary)

Appendix B: List of Acronyms

Alphabetically

ACEC	Advisory Commission on Electronic Commerce
B2B	Business-to-Business
B2G	Business-to-Government
BOC	Bell Operating Company
CIO	Chief Information Officer
DMA	Direct Marketing Association
DNS	Domain Name System
DOC	Department of Commerce
EU	European Union
FBI	Federal Bureau of Investigation
FCC	Federal Communications Commission
FTC	Federal Trade Commission
G2B	Government-to-Business
G2C	Government-to-Citizen
G2G	Government-to-Government
GAO	General Accounting Office
GSA	General Services Administration
gTLD	global Top Level Domain
ICANN	Internet Corporation for Assigned Names and Numbers
ILEC	Incumbent Local Exchange Carrier
IP	Internet Protocol
ISP	Internet Service Provider
IT	Information Technology
LATA	Local Access and Transport Area
LEC	Local Exchange Carrier
MOU	Memorandum of Understanding
NGI	Next Generation Internet
NIST	National Institute for Standards and Technology
NSI	Network Solutions, Inc,
NSF	National Science Foundation
NTIA	National Telecommunications and Information Administration
ONDCP	Office of National Drug Control Policy
OPA	Online Privacy Alliance
SSA	Social Security Administration
SSN	Social Security Number
TLD	Top Level Domain
UCE	Unsolicited Commercial E-mail
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

Categorically

U.S. Government Entities

DOC	Department of Commerce
FBI	Federal Bureau of Investigation

FCC	Federal Communications Commission
FTC	Federal Trade Commission
GAO	General Accounting Office
GSA	Government Services Administration
NIST	National Institute of Standards and Technology (part of Department of Commerce)
NSF	National Science Foundation
NTIA	National Telecommunications and Information Administration (part of Department of Commerce)
ONDCP	Office of National Drug Control Policy
SSA	Social Security Administration

Private Sector Entities

BOC	Bell Operating Company
DMA	Direct Marketing Association
ICANN	Internet Corporation for Assigned Names and Numbers
ILEC	Incumbent Local Exchange Carrier
ISP	Internet Service Provider
LEC	Local Exchange Carrier
NSI	Network Solutions, Inc.
OPA	Online Privacy Alliance

General Types of Internet Services

B2B	Business-to-Business
B2G	Business-to-Government
G2B	Government-to-Business
G2C	Government-to-Citizen
G2G	Government-to-Government

Internet and Telecommunications Terminology

CIO	Chief Information Officer
DNS	Domain Name System
gTLD	global Top Level Domain
IP	Internet Protocol
IT	Information Technology
LATA	Local Access and Transport Area
NGI	Next Generation Internet
TLD	Top Level Domain
UCE	Unsolicited Commercial E-mail

Other

ACEC	Advisory Commission on Electronic Commerce
EU	European Union
MOU	Memorandum of Understanding
SSN	Social Security Number
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

Appendix C: Legislation Passed by the 105th and 106th Congresses

Editions of this report prepared in the 105th Congress and the 106th Congress also addressed key technology policy issues affecting the use of growth of the Internet. Some of those issues continue to be of interest to Congress and are discussed in this edition of the report. Others, however, appear to be resolved from a congressional point of view, at least the moment, specifically encryption, electronic signatures, and protecting children from unsuitable material on the Internet. Those topics are not discussed in this version of the report. Nevertheless, it appears useful to retain information about legislation that passed on the subjects of most interest to the two previous Congresses. Following is such a summary, based on the topics that were previously in the report.

Legislation Enacted in the 105th Congress

Protecting Children: Child Online Protection Act, Children's Online Privacy Protection Act, and Child Protection and Sexual Predator Protection Act

In the FY1999 Omnibus Consolidated and Emergency Supplemental Appropriations Act (P.L. 105-277), Congress included several provisions related to protecting children on the Internet. Included is legislation making it a crime to send material that is "harmful to minors" to children and protecting the privacy of information provided by children under 13 over interactive computer services. Separately, Congress passed a law (P.L. 105-314) that, *inter alia*, strengthens penalties against sexual predators using the Internet.

The "harmful to minors" language is in the **Child Online Protection Act**, Title XIV of Division C of the Omnibus Appropriations Act. Similar language was also included in the Internet Tax Freedom Act (Title XI of Division C of the Omnibus Appropriations Act). Called "CDA II" by some in reference to the Communications Decency Act that passed Congress in 1996 but was overturned by the Supreme Court, the bill restricts access to commercial material that is "harmful to minors" distributed on the World Wide Web to those 17 and older. The American Civil Liberties Union (ACLU) and others filed suit against enforcement of the portion of the Act dealing with the "harmful to minors" language. In February, 1999, a federal judge in Philadelphia issued a preliminary injunction against enforcement of that section of the Act. The Justice Department has filed an appeal (see CRS Report 98-670, *Obscenity, Child Pornography, and Indecency: Recent Developments and Pending Issues* for further information).

The **Children's Online Privacy Protection Act**, also part of the Omnibus Appropriations Act (Title XIII of Division C), requires verifiable parental consent for the collection, use, or dissemination of personally identifiable information from children under 13.

The Omnibus Appropriation Act also includes a provision intended to make it easier for the FBI to gain access to Internet service provider records of suspected sexual predators (Section 102, General Provisions, Justice Department). It also sets

aside $2.4 million for the Customs Service to double the staffing and resources for the child pornography cyber-smuggling initiative and provides $1 million in the Violent Crime Reduction Trust Fund for technology support for that initiative.

The **Protection of Children from Sexual Predators Act** (P.L. 105-314) is a broad law addressing concerns about sexual predators. Among its provisions are increased penalties for anyone who uses a computer to persuade, entice, coerce, or facilitate the transport of a child to engage in prohibited sexual activity, a requirement that Internet service providers report to law enforcement if they become aware of child pornography activities, a requirement that federal prisoners using the Internet be supervised, and a requirement for a study by the National Academy of Sciences on how to reduce the availability to children of pornography on the Internet.

Identity Theft and Assumption Deterrence Act

The Identity Theft and Assumption Deterrence Act (P.L. 105-318) sets penalties for persons who knowingly, and with the intent to commit unlawful activities, possess, transfer, or use one or more means of identification not legally issued for use to that person.

Intellectual Property: Digital Millennium Copyright Act

Congress passed legislation (P.L. 105-304) implementing the World Intellectual Property Organization (WIPO) treaties regarding protection of copyright on the Internet. The law also limits copyright infringement liability for online service providers that serve only as conduits of information. Provisions relating to database protection that were included by the House were not included in the enacted version and are being debated anew in the 106th Congress. Since database protection per se is not an Internet issue, it is not included in this report (see CRS Report 98-902, *Intellectual Property Protection for Noncreative Databases*).

Digital Signatures: Government Paperwork Elimination Act

Congress passed the Government Paperwork Elimination Act (Title XVII of Division C of the Omnibus Appropriations Act, P.L. 105-277) that directs the Office of Management and Budget to develop procedures for the use and acceptance of "electronic" signatures (of which digital signatures are one type) by executive branch agencies.

Internet Domain Names: Next Generation Internet Research Act

The Next Generation Internet Research Act (P.L. 105-305) directs the National Academy of Sciences to conduct a study of the short and long-term effects on trademark rights of adding new generation top-level domains and related dispute resolution procedures.

Summary of Legislation Passed by the 105th Congress

Title	Public Law Number
FY1999 Omnibus Consolidated and Emergency Supplemental Appropriations Act	**P.L. 105-277**
Internet Tax Freedom Act	Division C, Title XI
Children's Online Privacy Protection Act	Division C, Title XIII
Child Online Protection Act	Division C, Title XIV
Government Paperwork Elimination Act	Division C, Title XVII
Protection of Children from Sexual Predators Act	**P.L. 105-314**
Identity Theft and Assumption Deterrence Act	**P.L. 105-318**
Digital Millennium Copyright Act	**P.L. 105-304**
Next Generation Internet Research Act	**P.L. 105-305**

Legislation Enacted in the 106th Congress

Electronic Signatures

The **Millennium Digital Commerce Act (P.L. 106-229)** regulates Internet electronic commerce by permitting and encouraging its continued expansion through the operation of free market forces, including the legal recognition of electronic signatures and electronic records.

Computer Security

The **Computer Crime Enforcement Act (P.L. 106-572)** establishes Department of Justice grants to state and local authorities to help them investigate and prosecute computer crimes. The law authorizes the expenditure of $25 million for the grant program through FY2004. The **FY2001 Department of Defense Authorization Act (P.L. 106-398)** includes language that originated in S. 1993 to modify the Paperwork Reduction Act and other relevant statutes concerning computer security of government systems, codifying agency responsibilities regarding computer security.

Internet Privacy

Language in the **FY2001 Transportation Appropriations Act (P. L. 106-246)** and the **FY2001 Treasury-General Government Appropriations Act** (included as part of the Consolidated Appropriations Act, P.L. 106-554) addresses Web site information collection practices by departments and agencies in the Treasury-General Government Appropriations Act. Section 501 of the FY2001 Transportation Appropriations Act prohibits funds in the FY2001 Treasury-General Government Appropriations Act from being used by any federal agency to collect, review, or create aggregate lists that include personally identifiable information (PII) about an individual's access to or use of a federal Web site, or enter into agreements with third parties to do so, with exceptions. Section 646 of the FY2001 Treasury-General Government Appropriations Act requires Inspectors General of agencies or departments covered in that act to report to Congress within 60 days of enactment on activities by those agencies or departments relating to the collection of PII about individuals who access any Internet site of that department or agency, or entering into agreements with third parties to obtain PII about use of government or non-government Web sites.

The **Social Security Number Confidentiality Act (P.L. 106-433)** prohibits the display of Social Security numbers on unopened checks or other Treasury-issued drafts. (Although this is not an Internet issue, it is related to concerns about consumer identity theft, a topic addressed in this report.)

The **Internet False Identification Prevention Act (P.L. 106-578)** updates existing law against selling or distributing false identification documents to include those sold or distributed through computer files, templates, and disks. It also requires the Attorney General and Secretary of the Treasury to create a coordinating committee to ensure that the creation and distribution of false IDs is vigorously investigated and prosecuted.

Protecting Children from Unsuitable Material

The **Children's Internet Protection Act (Title XVII of the FY2001 Labor-HHS Appropriations Act, included in the FY2001 Consolidated Appropriations Act, P.L. 106-554)** requires most schools and libraries that receive federal funding through Title III of the Elementary and Secondary Education Act, the Museum and Library Services Act, or "E-rate" subsidies from the universal service fund, to use technology protection measures (filtering software or other technologies) to block certain Web sites when computers are being used by minors, and in some cases, by adults. When minors are using the computers, the technology protection measure must block access to visual depictions that are obscene, child pornography, or harmful to minors. When others are using the computers, the technology must block visual depictions that are obscene or are child pornography. The technology protection measure may be disabled by authorized persons to enable access for bona fide research or other lawful purposes.

Internet Domain Names

The **Anticybersquatting Consumer Protection Act (part of the FY2000 Consolidated Appropriations Act, P.L. 106-113)** gives courts the authority to order the forfeiture, cancellation, and/or transfer of domain names registered in "bad faith" that are identical or similar to trademarks. The Act provides for statutory civil damages of at least $1,000, but not more than $100,000 per domain name identifier.

Summary of Legislation Enacted in the 106th Congress

Title	Public Law Number
Millennium Digital Commerce Act	**P.L. 106-229**
Computer Crime Enforcement Act	**P.L. 106-572**
FY2001 Transportation Appropriations Act, section 501	**P. L. 106-246**
FY2001 Treasury-General Government Appropriations Act, section 646 (enacted by reference in the FY2001 Consolidated Appropriations Act)	**P.L. 106-554**
Social Security Number Confidentiality Act	**P.L. 106-433**
Internet False Identification Prevention Act	**P.L. 106-578**
Children's Internet Protection Act (Title XVII of the FY2001 Labor-HHS Appropriations Act, enacted by reference in the FY2001 Consolidated Appropriations Act)	**P.L. 106-554**
Anticybersquatting Consumer Protection Act (enacted by reference in the FY2000 Consolidated Appropriations Act)	**P.L. 106-113**

Appendix D: Related CRS Reports

Broadband Internet Access: Background and Issues, by Lennard G. Kruger and Angele A. Gilroy. CRS Issue Brief IB10045. (Updated regularly.)

Broadband Internet Access and the Digital Divide: Federal Assistance Programs, by Lennard G. Kruger. CRS Report RL30719. 18 p. January 10. 2001.

Computer Fraud & Abuse: A Sketch of 18 U.S.C. 1030 And Related Federal Criminal Laws, by Charles Doyle. CRS Report 97-1024 A. 5 p. December 3, 1997.

Computer Fraud & Abuse: An Overview of 18 U.S.C. 1030 And Related Federal Criminal Laws, by Charles Doyle. CRS Report 97-1025 A. 85 p. November 28, 1997.

Copyright Cases in the Courts: Napster, MP3 Digital Music, and DVD Motion Picture Encryption Technology, by Robin Jeweler. CRS Report RL30683. 13 p. September 18, 2000.

Critical Infrastructures: Background and Early Implementation of PDD-63, by John D. Moteff. CRS Report RL30153, 21 p. January 12, 2001.

Cyberwarfare, by Stephen A. Hildreth. CRS Report RL30735. 17 p. January 16, 2001.

Digital Surveillance: the Communications Assistance for Law Enforcement Act and FBI Internet Monitoring, by Richard M. Nunno. CRS Report RL30677. 17 p. October 12, 2000.

Electronic Commerce: An Introduction, by Glenn J. McLoughlin. CRS Report RS20426. 6 p. January 25, 2001.

Electronic Commerce, Info Pack. by Rita Tehan. IP539P (Updated as needed)

Electronic Communications Privacy Act of 2000 (H.R. 5018): Summary in Brief, by Gina Marie Stevens. CRS Report RS20693. 6 p. October 3, 2000.

Electronic Stock Market, by Mark Jickling. CRS Report RL30602. 15 p. July 8, 2000.

Electronic Signatures: Technology Developments and Legislative Issues, by Richard Nunno. CRS Report RS20344. 6 p. January 19, 2001.

Encryption Technology: Congressional Issues, by Richard Nunno. CRS Issue Brief IB96039. (Updated Regularly)

Government Information Technology Management: Past and Future Issues (the Clinger-Cohen Act), by Jeffrey W. Seifert. CRS Report RL30661. 14 p. August 30, 2000.

Health information security and privacy: HIPAA and proposed implementing regulations, by C. Stephen Redhead. CRS Report RL30620. 23 p. July 28, 2000.

Intellectual Property Protection for Noncreative Databases, by Dorothy Schrader and Robin Jeweler. CRS Report 98-902 A. 17 p. September 15, 1999.

Internet and E-Commerce Statistics: What They Mean and Where to Find Them on the Web, by Rita Tehan. CRS Report RL30435. 15 p. October 24, 2000.

Internet Domain Names: Background and Policy Issues, by Lennard G. Kruger. CRS Report 97-868 STM. 6 p. December 12, 2000.

Internet Gambling: A Sketch of Legislative Proposals, by Charles Doyle. CRS Report RS20485. 6 p. January 11, 2001.

Internet Gambling: Overview of Federal Criminal Law, by Charles Doyle. CRS Report 97-619 A. 43 p. March 7, 2000.

Internet Privacy: An Analysis of Technology and Policy Issues, by Marcia S. Smith. CRS Report RL30784. 38 p. December 21, 2000.

Internet Privacy—Protecting Personal Information: Overview and Pending Legislation, by Marcia S. Smith. CRS Report RS20035. 6 p. January 16, 2001.

Internet—Protecting Children from Unsuitable Material and Sexual Predators: Overview and Pending Legislation, by Marcia S. Smith. CRS Report RS20036. 6 p. January 16. 2001.

Internet Service and Access Charges, by Angele Gilroy. CRS Report RS20579. 3 p. May 12, 2000.

Internet Taxation: Bills in the 106th Congress, by Nonna Noto. CRS Report RL30412. 23 p. November 22, 2000.

Internet Tax Legislation: Distinguishing Issues, by Nonna Noto. CRS Report RL30667. 20 p. January 11. 2001

Internet Transactions and the Sales Tax, by Stephen Maguire. CRS Report RL30431. 10 p. December 11, 2000.

Internet Voting: Issues and Legislation, by Kevin Coleman and Richard Nunno. CRS Report RS20639. 6 p. January 16, 2001.

"Junk E-mail": An Overview of Issues and Legislation Concerning Unsolicited Commercial Electronic Mail ("Spam"), by Marcia S. Smith. CRS Report RS20037. 6 p .January 16, 2001.

Legislation to Prevent Cybersquatting/Cyberpiracy, by Henry Cohen. CRS Report RS20367. 5 p. May 1, 2000.

Long Distance Telephony: Bell Operating Company Entry Into the Long Distance Market, by James R. Riehl. CRS Report RL30018. December 22, 2000. 10p.

Medical Records Privacy: Questions and Answers on the December 2000 Federal Regulation, by C. Stephen Redhead. CRS Report RS20500. 6 p. January 16, 2001.

National Information Infrastructure: The Federal Role, by Glenn J. McLoughlin. CRS Issue Brief 95051. (Updated Regularly)

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Obscenity, Child Pornography, and Indecency: Recent Developments and Pending Issues, by Henry Cohen. CRS Report 98-670 A. 6 p. January 2, 2001.

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Personal Privacy Protection: The Legislative Response, by Harold C. Relyea. CRS Report RL30671. 38 p. January 8, 2001.

Prescription Drug Sales Over the Internet, by Christopher Sroka. CRS Report RL30456. 8 p. March 10, 2000.

Spinning the Web: the History and Infrastructure of the Internet, by Rita Tehan. CRS Report 98-649 C. 16 p. August 12, 1999.

State Sales Taxation of Internet Transactions, by John Luckey. CRS Report RS20577. 4 p. January 10, 2001/

Telecommunications Discounts for Schools and Libraries: the "E-Rate" Program and Controversies, by Angele Gilroy. CRS Issue Brief IB98040. (Updated regularly).

Telemarketing: Dealing with Unwanted Telemarketing Calls, by James R. Riehl. CRS Report RL30763. December 11, 2000. 10 p.