other participants in the GII on issues related to protecting the confidentiality and integrity of information transmitted and stored on global networks;

• Exchange information and encourage further cooperation within regional and international organizations such as the ITU and the OECD on measures to ensure network security and reliability, including the sharing of outage information;

• Share information regarding the best means available to advance security goals while not impeding progress on other GII principles, such as the promotion of competition and open access; and

• Exchange information about, and accelerate efforts to develop new technologies needed to improve the security of the GII (e.g., encryption, digital signatures, and firewalls.)

3. Intellectual Property Protection

Protection of intellectual property rights is essential to the development of a successful GII. In order to promote creativity and provide the broadest possible access to the world's media and information sectors under viable commercial conditions, countries will need to protect the creative content of the GII—text, images, computer programs, databases, video and sound recordings, as well as multimedia products.

Providing for adequate and effective protection of intellectual property in the digital environment requires complex legal and technical solutions. Some of these solutions may be viewed as controversial by some users of the system. However, the cost to society of inadequate intellectual property protection far outweighs these concerns. Inadequate protection of intellectual property discourages the creation of copyrighted works, creates barriers to innovation, stifles the use of new applications, and diminishes foreign investment. It jeopardizes the work of researchers, creative artists, and a wide variety of entrepreneurs.

It goes without saying that if creative works are not adequately protected, their creators will be reluctant to permit them to be distributed over the GII. For this reason, rightsholders must not be compelled to license rights to their works. Instead, GII participants should cooperate to find legal, market-based alternatives to compulsory licensing. Reliable and efficient means of transferring intellectual property rights must also be assured. They might, for example, adopt various licensing arrangements, such as on-line and offline licensing, direct licensing, and voluntary collective licensing. More

sensitive issues, however, may have to be addressed on an individual basis. For example, licensing of rights may be done on a per-use, per-work, or other basis. Licensing of rights for multimedia works, which involve a number of copyrights—not all of them with obvious attributions—could be facilitated by special licensing arrangements.

Recommended Action

The GII cannot achieve its promise if authors, producers, and other content creators are not guaranteed adequate protection of their intellectual property rights. To achieve this protection, the United States will join with other governments to:

- Cooperate in national, bilateral, regional and international fora (such as the World Intellectual Property Organization) to achieve high levels of intellectual property and technical protection in order to guarantee to rightsholders the technical and legal means to control the use of their property over the GII;
- Ensure that voluntary licensing regimes provide rightsholders and potential users of copyrighted works maximum flexibility in negotiating the conditions governing the use of copyrighted works, eliminate compulsory licensing, and guard against the imposition of standards that would impede the free-flow of information;
- Provide effective enforcement against the unauthorized use of a copyrighted work (infringement), including severe legal penalties and vigilant monitoring. Enforcement is particularly critical as technological innovations jeopardize the existing ability of rights holders to protect their works;
- Encourage the development and use of technological capabilities and safeguards, such as software envelopes, headers, assurances of authenticity, and encryption methods to complement existing copyright management techniques and prevent infringement at all levels. Cooperative efforts to develop testbeds, define standards, and construct infrastructure components for these safeguards should be encouraged, as should measures to prevent or render illegal the use of devices to overcome these safeguards; and
- Work in collaboration with intellectual property-based industries towards greater efforts to educate others about the importance of intellectual property protection.

B. Applications: Delivering the Benefits of the GII

Given that the value of the GII will be determined by how people benefit from it, governments must cultivate active participation by consumers and businesses in the application of new technologies. By working together in creative partnerships, the public and private sectors can apply information and telecommunications technology to a variety of critical and complex issues: improving productivity and economic growth in an increasingly competitive and interdependent global economy; providing adequate health care; ensuring the development of workforce skills through education and training; providing equitable access to information through public institutions, such as libraries; enhancing leisure-time activities; protecting natural resources and the environment; and ensuring the delivery of government services and information.

Many governments are already examining ways to promote the development of the information infrastructure and to demonstrate. through pilot projects and testbeds, the myriad benefits of new technologies. In the United States, the National Information Infrastructure (NII) initiative includes a Federal matching grant program that provides support for planning and demonstration projects initiated by state and local governments and non-profit entities in such fields as health care and education.6 The U.S. NII initiative also includes a number of other federally supported applications in the areas of environmental monitoring, digital libraries, international transportation and trade, and the electronic dissemination of government information.7

The reach of applications being developed around the world can be expanded internationally through collaborative projects among

⁶ Administered by the National Telecommunications and Information Administration, the basic objective of the Telecommunications and Information Infrastructure Assistance Program (TIIAP) is to provide clear and visible demonstrations to people at the local level of the advantages that can be accrued in their daily lives as a result of having access to a modern, interactive information infrastructure.

⁷Additional information on how information infrastructure applications can benefit people can be found in two reports from the U.S. Information Infrastructure Task Force's Committee on Applications and Technology: "Putting the Information Infrastructure to Work," National Institute of Standards and Technology Special Publication 857, Gaithersburg, MD., 1994; and "The Information Infrastructure: Reaching Society's Goals," National Institute of Standards and Technology Special Publication 868, Gaithersburg, MD., 1994.