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AMERICA LEADS THE WAY IN NETWORKING TECHNOLOGY

Among the most persuasive arguments for continued federal support of pre-commercial R&D in high performance computing is the leadership role that the United States has played in developing the Internet -- the global computer network.

This stunning success is on the verge of becoming the single most revolutionary communications development of the 20th century, and has catapulted America to international primacy in advanced communications technology.

According to some industry predictions, within three years traffic on the Internet will exceed traffic on ordinary telephone lines. At the present growth trend, 100 million computers worldwide will be connected to the Internet by the end of this decade.

The commercial, economic and societal implications are enormous for virtually every aspect of our lives -- from how schools and libraries are run and scientific research is accomplished, to how business is conducted and health care delivered.

Every computer company is currently developing and producing hardware and software for the resulting market -- yet almost forgotten in the frenzy of activity is that a decade ago industry was not ready to make a commitment to ubiquitous networking.

Rather, it was federal support that seeded and stimulated the work of tenacious university researchers pushing the limits of high performance computing, and it is supercomputers that continue to be at the core of Internet operations today.

The embryo of the Internet was created by the National Science Foundation (NSF) in 1985. Before then there were only a few intercity computer connections, including a system called "BITNET," linking several universities, and ARPAnet, a Defense Department experimental network.

In 1985, the NSF using ARPAnet technology, established a new network called NSFNET to interconnect its six supercomputer centers and a growing list of universities that desired access to supercomputers for research.

From the onset, NSFNET aimed to provide "ubiquitous access" -- that is, access to anyone who needed it on the merit of their research. This service proved so beneficial that within a short time NSFNET connections were sought by major universities and colleges across the country and the federal government. Because of this dramatic success, the private sector moved to develop networks of its own.

Soon other countries, fearing competitive disadvantage, were also spurred to develop computer networks to which NSFNET swiftly provided links. This amalgamation has evolved into today's Internet.

Without the original momentum from the high performance computing community and continuing federal support, the Internet would not have developed first in the US and the US would not enjoy the leadership position in networking technology that it has today.

While the Internet enabled the transfer of vast amounts of information at high speed, its sheer scope would make it difficult for the average user to navigate. In 1993, software developers at the National Center for Supercomputing Applications (NCSA), supported by high performance computing funds from the NSF, created "Mosaic," a user interface software that provides point-and-click access to the diverse information storage protocols of the Internet. Because this easy to use graphical "browser" makes resources far more accessible, "Mosaic" is contributing to the rapid increase in use of and interest in the Internet. Several commercial products have already been "spun off" from Mosaic.