**FUTURE OF THE INTERNET**

The Internet is having trouble keeping up with the rapid increase in users and the increased workload created by the popularity of bandwidth-intensive applications such as music and video files. The broadband connections needed to enjoy these new applications are not evenly distributed. Several ongoing projects promise to provide solutions for these problems in the future. Once these connectivity problems are dealt with, people around the world will be able to enjoy the new Web services that are only a few short years away.

**Satellite Internet Connections**

Many people living in remote or sparsely populated areas are not served by broadband Internet connections. Cable or optical fiber networks are very expensive to install and maintain, and ISPs are not interested in providing service to areas or individuals unless they think it will be profitable. One hope for people without broadband connections is provided by satellite TV networks. Remote ISPs connect to the satellite network using antennae attached to their servers. Data is relayed to and from ISP servers to satellites, which are in turn connected to an Internet backbone access point. While the connection speeds might not be as fast as those offered by regular land-based broadband access, they are faster than the service twisted-pair cable can offer and much better than no access at all.

**Second Internet**

A remedy for the traffic clogging the information highway is **Internet2**, a revolutionary new type of Internet currently under development. When fully operational, Internet2 will enable large research universities in the United States to collaborate and share huge amounts of complex scientific information at amazing speeds. Led by over 170 universities working in partnership with industry and government, the Internet2 consortium is developing and deploying advanced network technologies and applications.

Internet2 is a testing ground for universities to work together and develop advanced Internet technologies such as telemedicine, digital libraries, and virtual laboratories. Internet2 universities will be connected to an ultrahigh-speed network called the Abilene backbone. Each university will use state-of-the-art equipment to take advantage of transfer speeds provided by the network.

**Internet Services for a Fee**

Industry observers predict that large portals such as AOL, MSN, and Yahoo! will soon determine effective structures and marketing strategies to get consumers to pay for Internet services. This new market, called bring-your-own-access (BYOA), will combine essential *content*, for example, news and weather, with *services*, such as search, directory, e-mail, IM, and online shopping, into a new product with monthly access charges. But to entice current and potential customers into the BYOA market, ISP and telecom companies must offer improvements in the area of security, privacy, and ease-of-use. Additionally, they are expected to develop new ways to personalize content and add value to the current range of Internet services.

**Internet in 2030**

Ray Kurzweil, a computer futurist, has looked ahead to the year 2030 and visualized a Web that offers no clear distinctions between real and simulated environments and people. Among the applications he sees as very possible are computerized displays in eyeglasses that could offer simultaneous translations of foreign language conversations, nanobots (microscopic robots) that would work with our brains to extend our mental capabilities, and more sophisticated avatars (simulated persons on-screen) that people will interact with online. Technologies that allow people to project their feelings as well as their images and voices may usher in a period when people could “be” with another person even though they are physically hundreds or even thousands of miles apart.