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Technology, Computer

Evolution of The Internet

The structure and makeup of the Internet has adapted as the needs

of the community have changed. Today's Internet serves the largest and

most diverse community of network users in the computing world. Since it

was created, the Internet has grown in size and become something that the

entire world is almost completely dependent on.

The Internet started as an experiment in the late 1960s by the

Advanced Research Projects Agency of the U. S. Department of Defense. It

was originally developed to explore the possibility of a communication

network where there would be no obvious central command, but all surviving

points would be able to re-establish contact in the event of a nuclear

attack. It continued simply because the Department of Defense, its

contractors, found that it provided a convenient way to communicate. For

the first decade the Internet was in existence, its primary use was to

facilitate e-mail, support on-line discussion groups, allow access to

distant databases, and support the transfer of files between government

agencies, companies, and universities(Cerf 286).

In December 1969, the experimental network went on-line with the

connection of a four-node network connected via 56 Kbps circuits. This

new technology, known as ARPANET, proved to be highly reliable and led to

the creation of two similar military networks, MILNET in the U. S. and

MINET in Europe. Thousands of hosts and users connected their private

networks to the ARPANET, thus creating the initial " ARPA Internet". The

problem with ARPANET is that it had an Acceptable Use Policy, which

prohibited the use of the Internet for commercial use(The ARPANET and
Computer Networks

143).

By 1985, the ARPANET was heavily used and congested. In response

the National Science Foundation began development of the NSFNET. The

NSFNET was made up of multiple regional networks and peer networks

connected to a major backbone that held the entire network together. In

its earliest form in 1986, the NSFNET created a three section network

architecture. The architecture connected campuses and research

organizations to regional networks. These connected to the main backbone

which linked six super-computer centers(Alexander 11).

The NSFNET backbone connected thirteen sites and five NSF supercomputer

centers.

In 1991, data traffic had increased tremendously, which caused the

upgrading

of the NSFNET's backbone network service . These new connections were

over one

hundred times faster than the original connections and much more

dependable due to

the implementation of two new protocols for the computers to communicate

with called

Transmission Control Protocol and Internet Protocol, commonly referred to as

TCP/IP

(Anderson 1064-65).

As late as the early 1990s, the NSFNET was still reserved for

research and educational applications; and government agency backbones

were reserved for mission-oriented purposes. But new pressures were being

felt by the networks, different agencies needed to interconnect with one

another. The nation was urning for network access, and Internet

service providers were emerging to accommodate those interests, defining a

new industry in the process. Networks in places other than the U. S. had

developed, along with interest in international connections. As the many

new networks pursued their goals, the complexity of connections and the

Internet's internal structure grew(Applications of Information Network

57).

Government agency networks connected at Federal Internet Exchange

points on both the east and west coasts. Commercial network organizations

had formed the Commercial Internet Exchange association, which built an

interconnect point on the west coast. At the same time, Internet service

providers around the world had developed substantial infrastructures and

connectivity. To begin sorting out the growing confusion, Sprint was

appointed by NSFNET to be the International Connections Manager to
provide

connectivity between the American, European, and Asian networks. NSFNET

was decommissioned in April 1995(The Evolution of Packet Switching 266-7).

The shutdown of the NSFNET had to be done in specific stages to

ensure continuous connectivity to various institutions and government

agencies that used to be connected to the regional networks. Today's

Internet structure has changed from a core network, such as NSFNET, to a

more distributed architecture operated by commercial providers connected

via major network exchange points. This " new" Internet is a collection of

providers that have connection points called points of presence over

multiple areas. Its collection of points and the way its points are

interconnected form a providers network. Customers are connected to

providers via the points of presence. Customers of the providers can be

providers themselves, and these providers using points of presence

thoughout the U. S. are known as national providers which are commonly

referred to as network service providers(Heart, et al. 46-48).

This network started out with a small four node experiment and

grew into the single largest machine the world has ever known.

Information can be sent between almost any two points on the globe. This

" Information- Superhighway" is one of the greatest achievements mankind

has ever seen, and will continue to shape the world and adapt to the new

world that it has created.