What is the Internet?

By Mohamed Bakayr—August 2004

Although the Internet started as a device for the US military to maintain communications in the event of attack, and its universities to exchange information, it has eventually developed in to a vast network of computers that permitted all people to share information on a regular basis. Unlike anything else before, the Internet has revolutionized communication methods. Truly, the invention of the telegraph, telephone, radio, and computer had paved the way to ultimately invent this unparalleled technology. The Internet has revolutionized the computer and communications world like nothing before. The invention of the telegraph, telephone, radio, and computer set the stage for this unprecedented integration of capabilities. The Internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location (Kahn 627).

As it is clear to all, the Internet has a worldwide information dissemination capability, and it is an excellent medium for collaboration and interaction between individuals, organizations and their computers without regard for geographic locations. In reality, the Internet embodies one of the most successful examples of communication means; besides, it invariably encourages sustained investment and commitment to the research and development of information infrastructure. Today Internet is a widespread information infrastructure, and it is the primary example of what is often called "the National Information Infrastructure." However, the history of the Internet is complex and involves many aspects, including technological, organizational, community, etc.

So, the Internet's influence reaches not only to the technical fields of computer communications, but also throughout societies, as we move toward increasing use of online tools to accomplish a variety of services. The Internet is the dominant tool of the Information Age, and it has permeated all countries, albeit is unpopularity in some countries. The USSR launched Sputnik, the first artificial earth satellite in 1957. In response, the United States formed the Advanced Research Projects Agency (ARPA) within the Department of Defense in order to introduce US lead in science and technology applicable to the military. A little later, ARPA united some of America's most talented people, who eventually developed the country's first successful satellite within eighteen months. So, several years later, ARPA began to focus on computer networking and communications technology. In 1962, a government agency was commissioned in order to launch a clear study on how it could maintain its command and control over its missiles and bombers, in the event of a nuclear attack. A military research network that could survive a nuclear strike had to be set up, and it had to be decentralized, so that if any city of the country were attacked, the military could still have control of nuclear arms for a counter-attack. Hence, in 1962 Dr. J.C.R. Licklider was chosen to head ARPA's research in improving the military's use of computer technology, because Licklider was a visionary man who sought to make the government's use of computers more interactive, he worked on how to quickly expand this technology throughout the USA.

Similarly, Paul Baran contributed greatly to the Internet and its digital packet switching, the Internet's fundamental data communications technology. As time went by, Dr. Licklider saw the need to move ARPA's contracts from the private sector to universities and the lake, so he laid the foundations for what later become the ARPANET. In 1968, ARPA awarded the ARPANET contract to another agency, and it had selected a Honeywell minicomputer as the base on which they would build the switch. However, the physical network was constructed in 1969; that physical network linked four nodes: University of California at Los Angeles, SRI International (in Stanford), University of California at Santa Barbara, and University of Utah. The network itself was wired together via 50 Kbps circuits, and the theme of ARPANET was to introduce computers as a communication medium between people.

Gradually, ARPANET grew into the Internet because the idea was to create multiple independent networks; therefore, ARPANET became the pioneering packet switching network pilot. Soon after, it introduced packet satellite networks, ground-based packet radio networks and other networks. Because packet switching has been the breaking down of data into datagrams or packets that are labeled to point out the beginning and the destination of a certain information, and forwarding those packets from one computer to another computer until the information eventually arrived at its ultimate end, ARPANET had comprehended the importance of computer networks. Indeed, messages sent by a particular computer had to be safeguarded and handled properly. The Advanced Research Projects Agency (ARPA) was renamed " The Defense Advanced Research Projects Agency" (DARPA). 1n 1972, Ray Tomlinson of BBN invented the first e-mail program; Tomlinson worked for Bolt Beranek and Newman (BBN). The company hired him in order to contribute to the building of ARPANET. Tomlinson developed electronic message programs called SNDMSG, and he wrote an efficient system that would allow programmers and researchers who were working on early ARPANET computers to leave messages for each other. However, that was not a real e-mail because SNDMSG only worked locally, and it was only designed to allow the exchange of messages between users who shared the same machine. Those users could create a text file and deliver it to a designated mailbox.

When Tomlinson sat down to play around with SNDMSG, he had been working on an experimental file transfer protocol called CYPNET. This protocol transferred files among linked computers at remote sites within ARPANET, though. At that time, ARPANET consisted of only 15 nodes, and they were located at different locations. Tomlinson chose the @ symbol to distinguish between messages addressed to mailboxes in the local machine and messages that were headed out onto general network. In 1973, a variety of developments started on the protocol later to be called "Transmission Control Protocol" TCP/IP. A group of scientists headed by Vinton Cerf from Stanford and Bob Kahn from DARPA spearheaded to develop this protocol and others.

Similarly, the Internet Protocol (IP) was developed. Anyway, these innovative protocols had to permit diverse computer networks to interconnect and communicate with each other. The protocols camp up with essential rules of how data are moved across networks, and how networks are established and broken into sections. Therefore, many people consider Vinton Cerf to be the father of the Internet. In 1974 Vint Cerf and Bob Kahn introduced the first use of the term "Internet", so the term " Internet" became a public word. A little later, the general public caught the first vague hint of how networked computers could be made of use, and the commercial story of the ARPANET went online.

In 1975, the operational management of Internet was transferred to DCA, now the Defense Information Systems Agency (DISA). Similarly, the first ARPANET mailing list was created, and John Vittal developed the first all-inclusive email programs which provided replying, forwarding, and filing aptitudes. In 1976, Dr. Robert M. Metcalfe developed Ethernet, which permitted coaxial cables to transfer data in a very fast way, so the development was a crucial component to the development of current LANs. Soon after, Internet technology went into practical use. In that same year, the packet Satellite network was born, linking the United States with Europe. On March 26, 1976, Elizabeth II, Queen of the United Kingdom sent out an email from the Royal Signals and Radar Establishment (RSRE) in Malvern, and the Department of the US Defense decided the use of TCP/IP protocols on ARPANET. In 1977, Unix introduced a strong built-in networking under its system, so the first transmission control protocol was developed for Unix. The University of California at Berkeley (Berkeley), had taken the first version that Unix developed and made substantial modifications to it. A number of Key additions were made to support the virtual memory and initial release of TCP/IP for Unix. That release from the Berkeley University was known as 4.2 BSD. In 1978, the first demonstration of Packet Broadcast Satellite communications over the Atlantic was conducted, and in that same year TCP split into TCP/IP. Later, IP became in charge of routing the packets, while TCP took care of packeting, error control, re-transmission and reassembly. TCP/IP enabled fast gateways to the network system. Jon Postel developed the fourth version specification for both TCP and IP, so this was the first time that Internet Protocol (IP) had got its own formal specification.

In 1979, Steve Bellovin, a graduate student and Tom Truscott created decentralized news group network; both men were programmers. The news group network was based on UUCP, and Time Network", introduced the "store and forward" network. It was used for email and listservs. Therefore, this network newsgroup permitted millions of users to access news and information on a broad variety of topics. Those topics include scientific, technical, job search information and recreational interest. With respect to those users who are familiar with listserv lists or other e-mail-based discussion lists, newsgroups offer imperative advantages. In 1981 National Science Foundation set up a backbone called CSNET 56 Kbps network for institutions without access to ARPANET, and Vinton Cerf suggested a viable plan for an inter-network connection between CSNET and the ARPANET.

In 1983, Internet Activities Board (IAB) was created, and on January 1st, every machine that was connected to ARPANET had to use TCP/IP; thus, TCP/IP emerged to be the core Internet protocol. TCP/IP allowed packets to get directed to a domain name that would be translated by the server database into the corresponding IP number. Therefore, it became much more easier for Internet users to access other servers. In 1984, ARPANET branched out into two networks: MILNET and ARPANET. On one hand, MILNET was to serve the needs of the military forces, while on the other hand, ARPANET had to support the advanced research components. In addition, the new network system was given the name "National Science Foundation Network" (NSFNET), and old lines remained to be called CSNET. In 1985, the National Science Foundation started organizing its new T1 lines, which would be finished by 1988.

In 1986, contractors for DARPA working on ARPANET mobilized an Internet Engineering Task Force to serve as a forum for technical coordination. In 198, BITNET and CSNET merged to form the Corporation for Research and Educational Networking (CREN). In 1988, T1 NSFNET backbone was completed, and quick plans immediately began to upgrade the network again. In 1990, Merit, IBM and MCI founded a non-profit corporation called Advanced Network & Services (ANS). This corporation conducted a high speed networking research; shortly after, they came up with the concept of the T3, a 45 Mbps line. The new network system was instantly adopted, and countless sites were connected by this new backbone. It has added a vibrant system to the previous networks.

With the advent of T3 lines, the Department of Defense disbanded the ARPANET, so ARPANET was replaced by the NSFNET backbone, and the original 50Kbs lines of ARPANET were made obsolete altogether. In 1991, 56Kbps lines were discontinued, and the NSF established a new network named "the National Research and Education Network" (NREN). The intention of this network was to conduct high speed networking researches. In 1992, the World-Wide Web was born, and NSFNET backbone was upgraded to T3 (44.736Mbps). In 1993, NSF created InterNIC so as to provide specific Internet services. Those services include directory and database services by AT&T, registration services by Network Solutions Inc. and information services by General Atomics/CERFnet).

In 1994, the most significant thing that happened was the growth of the Internet. However, many new networks were added to the NSF backbone. Also, hundreds of thousands of new hosts were added to the INTERNET during that year. In 1995, the National Science Foundation announced that it would no longer permit direct access to the NSF backbone, but it could provide groups with access to the NSF backbone. Also, the National Science Foundation had to sell connections to groups, organizations, and companies by levying $50 annual fee on all domains, excluding .edu and .gov domains which are still funded by the National Science Foundation. Form 1996 to present nothing mentionable has happened to the growth of the Internet. The most Internet traffic is carried by backbones of independent ISPs, including MCI, AT&T, Sprint, UUNet, BBN planet, ANS, and more.

Currently, the Internet Society, the group that controls the INTERNET, is trying to figure out new TCP/IP to be able to have billions of addresses in order to develop the limited system of today. However, it may take a long time to reach that end. The World Wide Web is born. In late 1940s, people have dreamt of a worldwide information database system, which would be accessible to all people around the world, and could easily link them to other sources of information. Thus, the World Wide Web concept is built upon the principle of universal readership. For instance, if a certain information is available in a particular resource and location, then any authorized person should be able to access it from anywhere in the world. Basically, the World Wide Web is a collection of different files from all over the world that are linked to each other.

The World Wide Web is part of the international computer network called Internet. … In a sence, it is just a bunch of wires and cables connecting millions of computers around the world. That may not sound very exciting in itself, but the Internet allows people all over the world to exchange information quickly and inexpensively. By hooking your own computer to this network of wires through the

telephone lines or by using special computers at your school or the local library, you can connect right to the Internet yourself. And then you can be a part of the World Wide Web (Lampton 58).

Indeed, it gets easier to look at a file that has a link to another file and then follow that link to read the next file. Usually, the web is not only confined to text, but also has graphics and the like. The files, often called pages, sit around on a machine that the server knows how to get to, and these files are analogous to videotapes of a TV show sitting around inside VCRs and waiting for someone to come and look at them.

The Web's implementation follows a standard client-server model. In this model, a user relies on a program (the client) to connect to a remote machine (the server), where the data is stored. The World Wide Web (www) has its own architect. The architecture of the WWW is the one of clients, such as Netscape, Mosaic, or Lynx, "which know how to present data but not what its origin is, and servers, which know how to extract data", but are ignorant of how it will be presented to the user. In 1991 Tim Berners-Lee developed The World Wide Web. He completed the original software for the World Wide Web, the hypertext system, which he had first proposed in 1989, and his vision for the system was far broader than many of his workers at CERN were aware. He anticipated that the WWW would be transformed from its origins as an information-retrieval system for physics researchers into a public information and communication device. Over the course of 1990 and 1991, Berners-Lee developed the components of the WWW system.

He recommended that the system ought to be flexible and designed with minimal constraint, so that it was compatible with numerous languages and operating systems; the system should be capable of recording random links between objects. The system had to be constructed, so that entering and correcting information was easily performed. The first version of the WWW included three basic architectural principles that aimed to accommodate these criteria. The first was called Universal Document Identifier (UDI), an address scheme for pointing the system to particular locations of the www.

UDIs were later renamed Universal Resource Locators (URLs). The hypertext Markup Language (HTML) has been in use by the World Wide Web (WWW) global information initiative since 1990. The Hypertext Markup Language itself is a simple markup language used to create hypertext documents that are viewable worldwide. The Hypertext Markup Language represents a variety of html built documents including news, mail, entertainment and the like. Heypertext Markup Language supports more multimedia options, scripting languages, style sheets, better printing facilities and the like; the HTML is part of ISO Standard 8879:1986. Another notable, significant element that the World Wide Web employs is the Hypertext Transfer Protocol (HTTP). HTTP serves as the protocol for accessing data and navigating through hypertext links.

Historically, the Hypertext Markup Language began in July of 1945 when Dr. Vannevar Bush, a science advisor for President Roosevelt during World War II, proposed the HTML in an article titled "As we may think." The article itself was published in The Atlantic Monthly. In that article, Bush outlined the ideas for a machine that would have the capacity to store textual and graphical information in such a way that

any piece of information could be linked to other source of information. HTML offers many of the conventional publishing idioms for rich text and structured documents. A link (hyperlink, or Web link), the basic hypertext construct, is a connection from one Web resource to another, and it has been one of the chief forces driving the success of the Web. Normally, a link has two ends-called anchors-and a direction.

The link starts at the "source" anchor and points to the "destination" anchor, regardless of document's type such as image, a video clip, a sound bite, a program, an HTML document, etc. A link has two ends-alled anchors-and a direction. The link starts at the "source" anchor and points to the "destination" anchor, which may be any Web resource (e.g., an image, a video clip, a sound bite, a program, an HTML document, an element within an HTML document, etc.). When visiting and navagating through linked resources, one selects a particular link by clicking the mouse over the desired link. The purpose of a certain link is to retrieve another Web resource so as to make use of it.

To conludie this essay, one may assert clearly that the Internet has reformed communication methods and become the dominant tool of these days. The Internet's influence permeated all nations, making the world " A Global Village". This communication tool surpasses all other communication mediums such as TV, Radio, Telegraph Newspapers and the like. It keeps all people informed if they are hooked to its inexpensive wires.

Works Cited

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