HOW DOES THE INTERNET WORK

What is the Internet?

The Internet, sometimes called simply "the Net," is a worldwide system of computer networks -- a network of networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers).

How does it work?

Because the Internet is a global network of computers each computer connected to the Internet must have a unique address. Internet addresses are in the form nnn.nnn.nnn.nnn where nnn must be a number from 0 - 255. This address is known as an IP address. (IP stands for Internet Protocol; more on this later.)

The picture below illustrates two computers connected to the Internet; your computer with IP address 1.2.3.4 and another computer with IP address 5.6.7.8. The Internet is represented as an abstract object in-between. (As this paper progresses, the Internet portion of Diagram 1 will be explained and redrawn several times as the details of the Internet are exposed.)

If you connect to the Internet through an Internet Service Provider (ISP), you are usually assigned a temporary IP address for the duration of your dial-in session. If you connect to the Internet from a local area network (LAN) your computer might have a permanent IP address or it might obtain a temporary one from a DHCP (Dynamic Host Configuration Protocol) server. In any case, if you are connected to the Internet, your computer has a unique IP address.

The internet works by using a packet routing network that follows Internet Protocol (IP) and Transport Control Protocol (TCP) [5].

TCP and IP work together to ensure that data transmission across the internet is consistent and reliable, no matter which device you're using or where you're using it.

When data is transferred over the internet, it's delivered in messages and packets. Data sent over the internet is called a message, but before messages get sent, they're broken up into tinier parts called packets.

These messages and packets travel from one source to the next using Internet Protocol (IP) and Transport Control Protocol (TCP). IP is a system of rules that govern how information is sent from one computer to another computer over an internet connection.

Using a numerical address (IP Address) the IP system receives further instructions on how the data should be transferred.

The Transport Control Protocol (TCP) works with IP to ensure transfer of data is dependable and reliable. This helps to make sure that no packets are lost, packets are reassembled in proper sequence, and there's no delay negatively affecting the data quality.

When you type in a web address into your browser...

Step 1: Your PC or device is connected to the web through a modem or router. Together, these devices allow you to connect to other networks around the globe [6]. Your router enables multiple computers to join the same network while a modem connects to your ISP (Internet Service Provider) which provides you with either cable or DSL internet.

Step 2: Type in a web address, known as a URL (Uniform Resource Locator). Each website has its own unique URL that signals to your ISP where you want to go.

Step 3: Your query is pushed to your ISP which connects to several servers which store and send data like a NAP Server (Network Access Protection) and a DNS (Domain Name Server).
Next, your browser looks up the IP address for the domain name you typed into your search engine through DNS. DNS then translates the text-based domain name you type into the browser into the number-based IP address.

- Example: Google.com becomes 64.233.191.255

Step 4: Your browser sends a Hypertext Transfer Protocol (HTTP) request to the target server to send a copy of the website to the client using TCP/IP.
Step 5: The server then approves the request and sends a “200 OK” message to your computer. Then, the server sends website files to the browser in the form of data packets.
Step 6: As your browser reassembles the data packets, the website loads allowing you to learn, shop, browse, and engage.
Step 7: Enjoy your search results!