IP VER 6 by Jonathan I. Kine, MBA, BBA, CDCP
Updated by Endah

Introduction

This document explains why the Internet is moving to IP version six (IP VER 6), how it affects you, how to tell if your internet Service provider is ready for IP VER 6, and provides you with additional reading resources.

IP VER 4

All devices that connect to the Internet and most internal networks require a unique Internet Protocol (IP) address. The dominant standard for IP addressing is IP version four (IP VER 4). IP VER 4 provides support over four billion unique IP addresses.

A single IP address is an address used in order to uniquely identify a device on an IP network. The IP VER 4 address is made up of 32 binary bits, which can be divided into a network portion and host portion with the help of a subnet mask. The 32 binary bits are broken into four octets (1 octet = 8 bits). Each octet is converted to decimal and separated by a period (dot). For this reason, an IP address is said to be expressed in dotted decimal format (for example, 172.168.81.100). The value in each octet ranges from 0 to 255 decimal, or 00000000 – 11111111 binary. (Example of IP version 4 below)

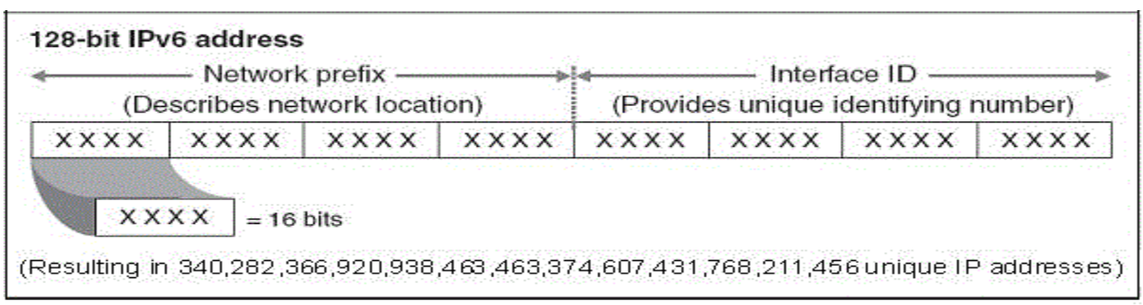
Image courtesy of the GAO (FCC.GOV)

Since 1990 the number of devices requiring public and private IP addresses to connect to the Internet has increased dramatically and proportionately relative to the number of consumer and corporate devices increased. The increased demand for IP addresses will exceed the available supply of IP VER 4 addresses. There is no set date for when IP VER 4 addresses will expire; however, demand for IP VER 4 addresses is consuming the limited current supply of the available pool of addresses. Thus, the need for a larger pool of addresses is required to prevent an Internet traffic jam. Thus, the introduction of IP VER 6 as a solution to fulfill the demand for IP addresses into the foreseeable future.

IP VER 6

IP VER 6 conversion is currently occurring as Internet Service Providers (ISP), Data Centers, and communication providers prepare for the end of IP VER 4. IP 4 has no definite expire date and will be supported while the conversion to IP VER 6 is underway. Yet as IP VER 4 addresses are no longer available, the need for IP VER 6 understanding, preparation and conversion is required.

IP VER 6 provides approximately 340 undecillion (340×10^{36}) IP addresses. Thus, providing for a larger supply of addresses available for consumers and enterprises. (Example of IP Version 6 below)



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Most operating systems available today understand IP VER 6 and will make conversion easy as Internet service providers and communication providers switch to IP VER 6. However, many routers do not work with IP VER 6 and require software and or hardware upgrades. In order to prepare below is a simple checklist that will ease your transition into IP VER 6.

Equipment and applications to check include (source GAO.GOV FCC.GOV):
 Computer operating systems such as Mac OS X, Windows and Android;
 Computer networking equipment such as cable and DSL modems, wireless access points ("Wi-Fi routers"), routers and home gateways;
 Networked home electronics such as Blu-ray players, AV receivers and television sets capable of connecting to the Internet;
 Home security systems that use IP networks;
 Internet service providers (ISPs);
 Web browsing software such as Internet Explorer and Firefox;
 Computer security software such as firewalls and anti-virus programs; and
 Voice-over-IP and video conferencing programs.

How can I tell if my ISP is ready? A free online network service test is available at http://test-ipv6.com/. In addition, check the websites of your ISP for VER 6 readiness. New computer equipment and software may have the "IPv6 Ready" logo on its packaging, as well as information within the owner's manuals

For more information

"Everyday Users: A Short Guide to IPv6", a web-based guide by the Internet Society:
www.internetsociety.org/everyday-users-short-guide-ipv6

The IPv6 Ready Logo Program's homepage: www.ipv6ready.org

American Registry of Internet Numbers, IPv6 Information Center:
www.arin.net/knowledge/ipv6_info_center.html