

## IPv6

Internet Protocol version 6 (IPv6) is a network layer IP standard used by electronic devices to exchange data across a packet-switched internetwork. It follows IPv4 as the second version of the Internet Protocol to be formally adopted for general use.

The main improvement brought by IPv6 is the increase in the number of addresses available for networked devices, allowing, for example, each cell phone and mobile electronic device to have its own address. IPv4 supports  $4.3 \times 10^9$  (4.3 billion) addresses, which is inadequate for giving even one address to every living person, much less support the burgeoning emerging market for connective devices. IPv6 supports  $3.4 \times 10^{38}$  addresses, or  $5 \times 10^{28}$  (50 octillion) for each of the roughly 6.5 billion people alive today, or about 800 addresses for each gram of matter in the Earth.

(Note: statements that IPv6 provides enough address space to give an address for each atom in the universe or even for each atom on Earth are exaggerated. However, the average person could address each atom in their body.)

Invented by Steve Deering and Craig Mudge at Xerox PARC, IPv6 was adopted by the Internet Engineering Task Force in 1994, when it was called "IP Next Generation" (IPng). (Incidentally, IPv5 was not a successor to IPv4, but an experimental flow-oriented streaming protocol intended to support video and audio.)

As of December 2005, IPv6 accounts for a tiny percentage of the live addresses in the publicly-accessible Internet, which is still dominated by IPv4. The adoption of IPv6 has been slowed by the introduction of network address translation (NAT), which partially alleviates address exhaustion. Nevertheless, as of August 2006, the primary IANA pool is expected to run out in the 2009 to 2011 timeframe if current trends continue. The U.S. Government has specified that the network backbones of all federal agencies must deploy IPv6 by 2008.[1]

It is expected that IPv4 will be supported alongside IPv6 for the foreseeable future.