

ITFreeTraining



Introduction to IPv4

For the free video please see
<http://itfreetraining.com/ipv4/intro>

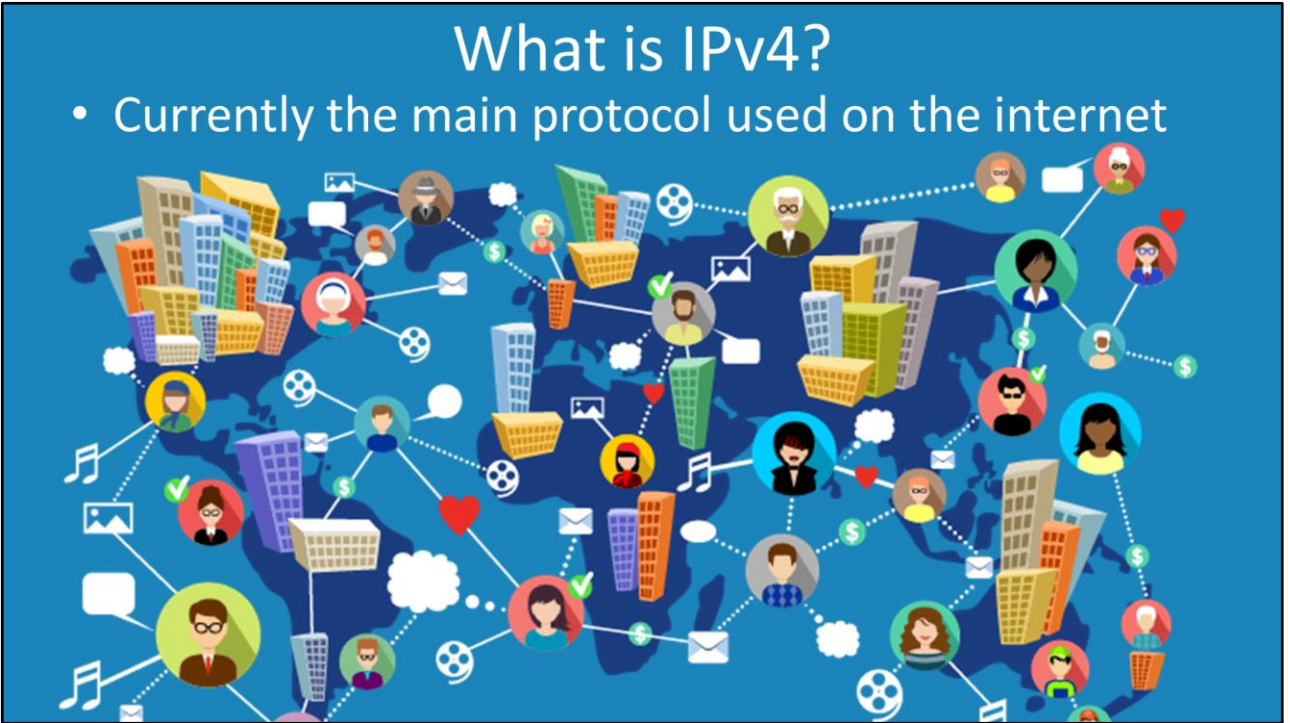
Welcome to the first video from ITFreeTraining on the topic of Internet Protocol version 4. This course will take you through everything you need to know about IPv4 in your networks.

Access the rest of the course <http://ITFreeTraining.com/ipv4>

Download the PDF handout <http://ITFreeTraining.com/handouts/ipv4/intro.pdf>

What is IPv4?

- Currently the main protocol used on the internet



What is IPv4?

0:17 – To start, what is IPv4? Internet Protocol version 4 is the main protocol currently in use throughout the entirety of the Internet. It is the protocol that is used to connect users and their devices to each other. It is the same regardless of operating system, device or hardware that is used and it provides a structure and backbone for communication between individuals and companies globally.

IPv4 History

- Deployed in 1983
- Improved and expanded to meet needs
- Reaching limits



IPv4 History

0:39 – So what is the history behind Internet Protocol version 4? IPv4 was first deployed back in 1983. There were other versions of the protocol before this, however they were never used in production. To meet demands, IPv4 has been improved and expanded. However, it is starting to finally reach its limits with today's environment and for a number of reasons.

Limited Address Space

- 32-bit address which gives 4,294,967,296 addresses

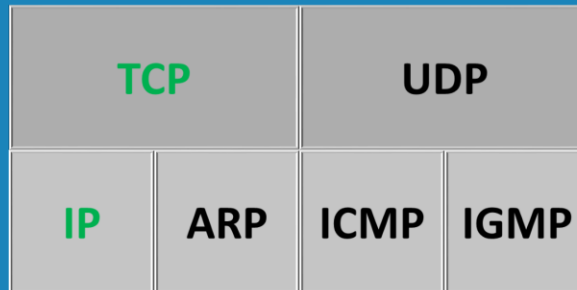


Limited Address Space

1:02 – The main, glaring limitation is the finite amount of publically available internet addresses that can be used with IPv4. This is due to IPv4's design which is based on a 32-bit address. This leaves us with a little over 4 billion addresses, and this may sound like a lot, but in reality it is not when you consider the number of computers that are connected to the internet and the exponential growth of internet-enabled mobile devices such as tablets, smartphones and even devices like thermostats and home security systems. With this factored in, 4 billion is going to be far from enough. Even with the limited number of addresses, a number of address sharing protocols have been developed such as the Network Address Translation (NAT) protocol. This has increased the shelf life of IPv4, but one day soon it will completely exhaust its supply of publically available IP addresses and that will be its limit. To allow for the expansion of the Internet, Internet Protocol version 6 has been developed to replace IPv4. The deployment of IPv6 has been very slow with many ISPs not adopting it readily, so IPv4 will still be in use as the primary protocol of the Internet for some time and remain dominant throughout the Internet so it is still very worthwhile to take the time and learn it.

TCP/IP

- Transmission Control Protocol (TCP)
 - Reliable transmission
- User Datagram Protocol (UDP)
 - Unreliable transmission



TCP/IP

1:59 – In some cases, you may see the term TCP/IP (Transmission Control Protocol/Internet Protocol). In order to communicate across the Internet, a number of different protocols are used. Of these protocols, the main set that go into providing the communication structure is the Transmission Control Protocol (TCP) and the Internet Protocol (IP). Thus IPv4 was often referred to as TCP/IP. Nowadays, the collection of protocols is often simply called the Internet Protocol. Another term you may hear from time to time is the Transmission Control Protocol or TCP. This protocol is used for reliable data transmissions due to its built-in features. Most communication on the Internet uses TCP and thus you can begin to understand why it is considered to be one of the main protocols. When reliable transmission is used, lost or corrupt packets are detected. When these are detected, they are resent to ensure that no data is lost or missing during transmission. There is also an additional protocol, the User Datagram Protocol or UDP that be used for communication. This protocol is used for unreliable communications similar to sending a letter through the postal system. Once you send the letter, you are not sure if it will arrive at the destination. It could potentially get lost in transit. Unreliable communication is often used for time sensitive applications like live video. Reliable transmission will delay a transmission if data is lost and needs to be resent. With applications like live video, if some data is lost the application will make best use of the data it has. In this case, the application would rather use the newest data available rather than wait for retransmission of lost data. As well, UDP has much less overhead and size than TCP transmissions.

See <http://YouTube.com/ITFreeTraining> or <http://itfreetraining.com> for our always free training videos. This is only one video from the many free courses available on YouTube.

References

“Internet protocol suite” https://en.wikipedia.org/wiki/Internet_protocol_suite

“Transmission Control Protocol” https://en.wikipedia.org/wiki/Transmission_Control_Protocol

Credits

Voice Talent: HP Lewis <http://hplewis.com>

Website and Social Media Manager: Phil Guld <http://philguld.com>

Video Production: Kevin Luttman <http://www.KeinLuttman.com>

Quality Assurance: Brett Batson <http://www.pbb-proofreading.uk>