

Forum:[Hack Forums](#)

Thread: [\[TuT\]Basics of Networking](#)

0x45 - June 7, 2010, 4:02 am

Basics of Networking

---By Xin R

Networking - It is basically interconnection between various devices.

The ways of interconnecting and some definitions is what we discuss in this tutorial.

There are 2 main types of interconnection.[Based on How devices are connected]

TCP- Transmission Control Protocol

UDP - User Datagram Protocol

Protocol- They are the rules by which network devices are connected.

TCP

TCP stands for Transmission Control Protocol. To make it not confusing, it is simply a 'direct' connection between various components without using a router.

When we share a file using MSN or when we download torrents, they are TCP connection as we directly connect to another computer.

UDP

UDP stands for User Datagram Protocol. UDP Networks work like both devices connect to another device called router and it acts as a medium of transmission. Means, we send data to router and router redirects data to where we want the data to be transmitted.

For a better understanding of TCP and UDP, go [here](#)

Again, there are 3 types of network[Based on Area]

LAN - Local area network - The network we find in offices. They are available to that specific location only.

WAN - Wide area network - A little broader than LAN

MAN - Metropolitan Area Network - The connection is available to a large city.

Again, 2 types of network[Based on Connection Type]

Ethernet - Computers are connected physically or using wires.

WLAN - Also called Wifi, They are connected physically, but by using radio waves. Almost all Laptops available now are equipped with WLAN. If not, it costs just around 10\$ to buy one receiver.

WLAN is highly insecure as compared to Ethernet as someone with a wifi card can connect to your network and browse internet or steal your data, infect you etc. If left open. However there are pros too.

IP - Internet protocol. The protocol we use to connect devices. IP Address are addresses unique

to each device in a network and is used to identify each device.

Two versions of IP addresses are available at present

IPv4 - They are like xxx.xxx.xxx.xxx where xxx are numbers, not letters and each xxx can have a maximum value of 255. Meaning, there can be 255x255x255x255 unique devices connected to a network.

IPv6 - Since the bandwidth of IPv4 is low as more and more devices are connected to internet, a new type of IP address is developed which is not used now.

IPv6 Addresses look like xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx

Where each x can be Letters(A, B, C, D and E) or numbers(decimal numbers).

basically, each x is a Hexa decimal value.

It has much more bandwidth compared to v4.

Ports- They can be compared as 'channels' in TV and IP addresses as TV itself. Meaning, within the same ip, there are many ports[Dont remember howmuch exactly] at around 65thousand with each type[TCP and UDP] with IPv4, like there are many channels with each TV. Each port is for different functions.

Some common ports are 80(Web), 21(FTP), 22(SSH), 23(Telnet) etc.

Each device connected to network can be called a node.

Host - It is the computer or device that transmits data.

Workstation- It is simply a computer. Donot confuse, there is nothing fancy about it. It is simply a computer.

Some people call 'high end' computers workstation.

OSI

OSI - It is a set of rules on connecting various devices. It is developed because in earlier days, different types of computers such as apple II and IBM etc could not be connected.

There are 7 Layers in OSI Model:

[img]http://blessedhands3333.com/personal_journal/images/osi_model1.jpg[/img]

Application Layer:- The so called web browsers, email and ftp clients etc. This layer interacts with user and sends and receives data to and from its nearby layers. This is the 7th layer in OSI Model of networking.

Presentation Layer:- This layer is responsible for arranging the data orderwise according to the various frequencies by which data is received. If this layer was not there, if someone send "Good Night", we would get it as "hGtiG Ndod" or other similar words.

Session Layer :- This is the layer that opens up the connection between host and client. Without this layer, we cant send or receive messages.

Transport Layer :- This layer analyses the data and send it to appropriate applications. For example, if you receive a webpage, you dont want to go that data to an email client(Outlook). So transport layer in OSI model helps in this process.

Network Layer :- The MOST important Layer. This layer routes our data to destination. Think of it if

the passwords we send gets routed to some other location!

Data Link Layer :- Network layer directs the data. It is transferred by Data Link layer.
It have 2 sub Layers:

LCC Sub Layer

MAC Sub Layer

Physical Layers :- Those hardware parts of networking, including cables, IC Chips, Network cards etc. The bottom layer of networking and its basis.

I will update this tutorial soon with more info.

Kindly point out any mistakes and PM me or post here if there is. I am not an expert.

Dan08 - June 7, 2010, 4:23 am

Looks good. BTW its 'devices' not 'devises'. You could expand it a little bit more but for a basic understanding it's enough. Really good :D

0x45 - June 7, 2010, 11:21 am

Thankyou for pointing out. Corrected. :)

Qkyrie - June 7, 2010, 2:10 pm

Maybe you can add to the ports:

ports are stored as a 16bit binary word, therefore, there are 2^{16} combinations. (65536)

Dan08 - June 7, 2010, 2:22 pm

and the IPs, class A B and C ;)

0x45 - August 16, 2010, 9:19 am

Please post your suggestions, critics and other s..

omgitzkevin - August 16, 2010, 2:07 pm

Very helpful to someone new like me, Thanks!

Keypel - August 16, 2010, 7:37 pm

I liked it.

Nicely described.

0x45 - August 23, 2010, 11:09 pm

THankyou. Tutorial Updated again. Rate this thread please.

3v0|v3 - August 23, 2010, 11:29 pm

Nice Stuff. I personally liked it. Thank You.

endlessbounty - August 24, 2010, 11:53 pm

good job this explains things well :)

Sir SkinowZ - September 28, 2010, 2:54 pm

Good tutorial
Thank you ?

ac1dxtrem - September 28, 2010, 3:08 pm

Nice one :) Just 2 things: Telnet port is 23 not 25 and Hexadecimal goes from A to F not to E :)

MasterMind98 - September 29, 2010, 11:01 am

Nice tutorial for the basics, well organized and easy to read.

0x45 - April 30, 2011, 8:02 am

(Sep 29, 2010 11:01 AM)MasterMind98 Wrote: [\[CITE\]](#) Nice tutorial for the basics, well organized and easy to read.

Thankyou! Mastermind98!

Xin R

Middle - April 30, 2011, 8:38 am

How haven't i seen this before, did it get moved from some where?

Nice thread! I am sure it will help some people out :)

disk0 - April 30, 2011, 4:52 pm

The types of connections are not 'Ethernet' and 'WLAN.' There are 'wired' and 'wireless' connections, but WiFi connections are still a type of Ethernet connection. I believe there is some other information that is incorrect, but I'll have to look over it later.

0x45 - April 30, 2011, 7:03 pm

(Apr 30, 2011 04:52 PM)disk0 Wrote: [\[CITE\]](#) The types of connections are not 'Ethernet' and 'WLAN.' There are 'wired' and 'wireless' connections, but WiFi connections are still a type of Ethernet connection. I believe there is some other information that is incorrect, but I'll have to look over it later.

A'rite. Thanks for the info. :)

XIn R

`Mafia - April 30, 2011, 11:07 pm

Everyone on these forums should read this and learn it.

When you know these basic principals and how networks work then anyone with a decent level of logic can figure most problems they run into. EG If everyone in the RATs section read this thread there would be a ton less "help no connections/port problem/what's a host" etc.. list goes on forever.

oCondor - May 1, 2011, 4:07 am

Simple but a good read thanks.

MaXoNe - May 1, 2011, 6:12 am

This is thread that everybody who join hackforums should visit.I have a book with informat. terms , and explanation of every of them.That is the first thing I've learned before I started programming.New users should be suggested to visit this thread.Great job Xin R.

0x45 - October 3, 2011, 10:08 pm

(May 1, 2011 06:12 AM)MaXoNe Wrote: [\[CITE\]](#) This is thread that everybody who join hackforums should visit.I have a book with informat. terms , and explanation of every of them.That is the first thing I've learned before I started programming.New users should be suggested to visit this thread.Great job Xin R.

Thanks MaXoNe. Well thats it!

Xin R

Mekara - October 4, 2011, 12:01 pm

Nice alot of information , explains everything about networking]

theanonymousguy123 - October 4, 2011, 2:01 pm

nice little tutorial. you could add the internet layers model as well and some info on Media Access Control

0x45 - May 21, 2012, 7:36 am

(Oct 4, 2011 02:01 PM)theanonymousguy123 Wrote: [\[CITE\]](#) nice little tutorial. you could add the internet layers model as well and some info on Media Access Control

I havnt been to this forum for a long time so now i will update it with what you said/.

lewis188 - May 21, 2012, 8:12 am

Really helpful for noobies such as I, thanks!

0x45 - May 21, 2012, 9:23 am

(May 21, 2012 08:12 AM)lewis188 Wrote: [\[CITE\]](#) Really helpful for noobies such as I, thanks!

yeah. you are welcome lewis188. Please take time to upgrade yourself to l33t.

Xin R

#BORNE - April 18, 2014, 12:36 pm

Great tutorial OP, bookmarked. Gonna have a good read tomorrow.

grandseller - April 21, 2014, 1:31 pm

Thank you too much, really helped me.

Goodies - April 22, 2014, 6:23 pm

Oh lord. Okay, I am sorry if I come off sounding like an asshole, but only a small amount if this information is actually correct. There are incorrect statements everywhere.

I have a few years taking classes in networking as well as a CCENT certification (currently working on CCNA). I'd be glad to talk over Skype and straighten this stuff out because a lot of it is plain wrong.

Firstly, "UDP networks" don't exist. Nor do TCP Networks. They are 2 transport protocols. There are more like SCTP and RDP (reliable datagrap protocol, not Remote Desktop).

Secondly, I don't think you actually know what WAN/LAN/MAN means. Yes, you got the acronyms right, but the way they connect us different.

Thirdly, you clearly have no concept of IP subnetting because your definition of IPv4 address space is completely incorrect. You never mentioned that subnet masks are what determine how many device can be in a network, the network and broadcast addresses, and which devices can talk to which other devices.

Fourth(ly?), your use of the word 'bandwidth' doesn't make sense when describing IPv6. Considering IPv6 packets are considerably larger than IPv4, they wouldn't reduce bandwidth. They do, like you said, allow for many MANY more IP addresses.

Fifth, hexadecimal goes from A to F and IPv6 networks do allow F's in their addresses.

IPv4 is four octets of 8 bits each which mean they can go from 2^0 (1) to 2^8 (255). But again, subnet masks have everything to do with network space. IPv6 is 128 bits rather than 32. IPv4 has 2^{32} possible combinations (about 4 billion) and IPv6 has 2^{128} (32 undecillion).

Anyways, there are a huge amount of errors in this. It's great that you're getting people interested, but its full of incorrect data.

sarahssxy - April 24, 2014, 5:16 am

This tut is really helpful thanks man :)

0x45 - April 25, 2014, 7:27 am

(Apr 22, 2014 06:23 PM)Goodies Wrote: [CITE](#) Oh lord. Okay, I am sorry if I come off sounding like an asshole, but only a small amount if this information is actually correct. There are incorrect statements everywhere.

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Anyways, there are a huge amount of errors in this. It's great that you're getting people interested, but its full of incorrect data.

Yeah I know. Maybe I should probably take this thread down. I wrote it as a part of "Read something, write tutorial on it to learn" strategy, which sucks.

OnlineSpartan - April 26, 2014, 11:34 am

Not bad, but you can add a quick note to the key differences to TCP/UDP

TCP: connection oriented protocol: sequences packets and requests for a re-transfer when it sees corruption or it has not received the packet. Promotes connection stability.

UDP: connectionless. Literally just sends data and says IDGAF if you got the packets or not. Works best for conditions such as VOIP where a stream of data is needed, but slight packet loss is acceptable (small lag, break...think streaming).

oh, and ditto for above post.