

Forum:[Hack Forums](#)

Thread: [\[TuT\] Introduction to Networking \(Part 1\)](#)

Mushr00m - May 16, 2010, 5:51 pm

Introduction to Networking Part 1

By: Mushr00m

Note: After my basic networking tutorials (May be around 15-20 of them) are written I will move onto network security, and how to use this knowledge to test network vulnerability

Components of a Network

1. Nodes (Host/Host computers)

-Servers: provide service for clients. Examples: file servers, print servers, web servers, e-mail servers, and directory servers.

-Clients: Input/Output (I/O) device at the user end.

2. Links (The path through which the message travels)

-Cables

-Space (if using WiFi)

-Hubs

-Switches

-Routers

-Gateways

Click below for basic network topology

(Picture source: <http://www.aquafruit.com.au/blog/wp-content/uploads/2008/12/picture-16.png>)

Spoiler ([Click to View](#))

[img]http://www.aquafruit.com.au/blog/wp-content/uploads/2008/12/picture-16.png[/img]

Client Server vs. Peer-to-peer

1. Client & Server Coordinate

-The server provides services such as the web, printing, storage, and access control.

-Clients access these services.

2. Peer-to-peer (Host/Host computers)

-No proprietary servers

-Computers take turns to provide access to servers.

Types of Networks

1. Local Area Network (LAN)

-Small networks that are usually only the size of a room or building. A LAN is composed of a group of PC's that are attached to the same circuit.

2. Backbone Network (BN)

-A backbone network usually can stretch from a couple hundred meters, to a few kilometers. It is a high speed backbone that connects LANs at different locations.

3. Metropolitan Area Network (MAN)

-MANs can stretch anywhere from a few kilometers to tens of kilometers. MANs connect LANs and BNs at different locations. Data is usually transmitted through leased lines or commercial services.

4. Wide Area Network (WAN)

-Can range anywhere from a few hundred kilometers to thousands of kilometers. Data is transmitted the same way mentioned in MANs, through leased lines or commercial services.

Internets and Extranets

Internet

- The internet is a network made up of networks
- It is worldwide
- Publicly Accessible

Intranet

- A website or other app that is only accessible by the internal users of a network

Extranet

- Provides controlled access to corporate websites and apps usually provided to select individuals.

Note: Internet, intranet, and extranet all share the same network model and protocols.

Network Models

Two of the most important network models are:

- Open System Interconnection Model (OSI Model)
- Internet Model

OSI 7 Layer Model:

7. Application Layer-Provides a set of protocols used by programs on the network.
6. Presentation Layer-Prepares data for the user, uses data to provide an interface, data compression and translates between different formats.
5. Session Layer-Starts, keeps, and ends sessions between the sender and the receiver.
4. Transport Layer-Prepares messages for transport throughout the network. Keeps the connection established between the message sender and the message receiver.
3. Network Layer-Makes routing decisions.
2. Data Link Layer-Identifies the beginning and end of a message (called message delineation), checks messages for errors, and network medium access control.
1. Physical Layer-Defines how bits are formatted to actually be transmitted through the network.

The Internet 5 Layer Model:

5. Application Layer-The application layer is used by apps.
4. Transport Layer-Establishes connections. The transport layer translates domain names into its corresponding numeric address and breaks larger messages into smaller messages.
3. Network Layer-Makes routing decisions.
2. Data Link Layer-Identifies the beginning and end of a message (called message delineation), checks messages for errors, and network medium access control.
1. Physical Layer-Defines how bits are formatted to actually be transmitted through the network.

What is a protocol?

A protocol is a set of rules that decides how to communicate with each layer and how to interface with adjacent layers.

Networking Example:

- Clicking a link starts an HTTP request-response cycle. Your browser now sends the HTTP request.
- HTTP request is now forwarded to the transport layer's TCP protocol. The HTTP request is then

placed in a TCP segment.

- TCP segment then gets placed in a network layer packet, called the IP.

- The IP packet is then put into a data link layer frame. The TCP segment is sent over the network media access (such as fiber optic cables) as a series of 1's and 0's (physical layer).

Network Standards

Example of standards that are used in each layer:

Application Layer-HTTP, WAP, RTSP, H.323, FTP, SMTP, IMAP, POP

Transport Layer-TCP, SPX

Network Layer-IP, IPX

Data Link Layer-Ethernet, PPP

Physical Layer-Cat 5 Twisted Pair Cables (LAN), V.92 (56 Kbps Modem)

Standard Making Bodies

- International Organization for Standardization (ISO)

- International Telecommunications Union-Telecom Group (ITU-T)

- American National Standards Institute (ANSI)

- Institute of Electrical and Electronic Engineers, Standards Association (IEEE-SA)

- International Engineering Task Force (IETF)

NOTE: THIS TUTORIAL MAY BE REPRODUCED FREELY OVER THE INTERNET.

the rofler - May 16, 2010, 6:10 pm

I like it. Clearly written and easy to understand. Maybe it'll help retards like me learn something for once. I look forward to more.

syrenen11 - May 16, 2010, 6:16 pm

(May 16, 2010 06:10 PM)the rofler Wrote: [CITE](#) I like it. Clearly written and easy to understand. Maybe it'll help retards like me learn something for once. I look forward to more.

Just like he said, very well written. Although I knew most things, there's some things in there, that I did not learn, and now do. Thanks alot for this clarification.

Mushr00m - May 16, 2010, 6:19 pm

No problem, I'm glad I was able to help. I am writing Part 2 as we speak (or type rather). By the end of the week I should have all of them written. After the basics of networking tutorial series is written I will be starting a series on network security.

tibzoy - May 16, 2010, 6:55 pm

Mushr00m...

This is great man! Your post is really helpful for a noob like me.

AndyKLovin - May 16, 2010, 7:22 pm

Very good article, can you cover Darknets next? :-)

Mushr00m - May 16, 2010, 7:24 pm

(May 16, 2010 07:22 PM)AndyKLovin Wrote: [CITE](#) Very good article, can you cover Darknets next? :-)

I am going to first finish my series of tutorials as I have mapped out an outline of what I am going to discuss. Once I finish this series, but before I start my series on network security, I will compose a tutorial about darknets.

Also, thank you for the positive feedback everyone!

phybe? - May 16, 2010, 7:29 pm

Great introduction guide! The sub sections are very nice and well organized.

Agentdigitalife - May 16, 2010, 7:56 pm

This will deffently help someone who doesn't know the basics. Looking forward to reading more.

Fireren - May 16, 2010, 7:58 pm

Nice tutorial. Maybe this will help make it even better!

<https://hackforums.net/showthread.php?tid=425030>

:)

Good job.

Mushr00m - May 16, 2010, 8:19 pm

(May 16, 2010 07:58 PM)Fireren Wrote: [\[CITE\]](#) Nice tutorial. Maybe this will help make it even better!

<https://hackforums.net/showthread.php?tid=425030>

:)

Good job.

I'll definitely reformat it and color code it in the near future. I will probably not be uploading any more tutorials until Wednesday because I have exams Monday and Tuesday. So on Wednesday I will re-format this one and the 2nd part, and upload my next tutorial on the physical layer.

Eclipse - June 6, 2011, 1:15 am

Well, 2 more parts of this. And then I have a basic knowlegde of Networking.

Eclipse - June 6, 2011, 1:15 am

Well, 2 more parts of this. And then I have a basic knowlegde of Networking.

abd - June 6, 2011, 1:23 am

nice table of networking,

ngit01 - June 6, 2011, 5:06 am

THIS ONE IS NICE, IT HELPS ME A LOT. THANKS FOR THE SHARE :D

ifido2020 - June 9, 2011, 11:28 pm

Nice tutorial, Learned a lot...

trixor - June 10, 2011, 10:38 am

Thanks very good tutorial :D

Napsteren - June 10, 2011, 10:56 am

I like it too! But you are missing a couple of things, such as how TCP and UDP works. I can't see anything about UDP. Your OSI model is also almost correct, you are just missing a few things! The transport layer is also TCP, "UDP, DCCP, SCTP" and SPX, but most of all TCP and UDP. Else, nice work! Keep it up! ;)

bnistor - June 10, 2011, 11:43 am

Good start but I wish I would have seen TCP/IP protocols explained, how UDP and TCP protocols works, port numbers and affiliated services and what they do, differences in CAT cabling and bandwidth definitions, WiFi and applicable security options and definitions and CDMA/CD and CDMA/CA explained. That would have made it a really good Networking 101 tutorial. If you would like, I can help you expand on these topics further. Otherwise, good start to a, what-could-be,

excellent tutorial.

EDIT: Also, should have networking tools explained like ping, netstat, tracert, etc...

klunghog - *June 10, 2011, 12:09 pm*

Definitely subscribing to this thread. Looks well thought out and easy to understand. Thank you.