KUBH/GH Network Training

"Network Administration 101"

By

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CE-IV

Network Administration 101

- Beginners & Intermediate in Networking
- Start career in Networking or Network/System Administrator
- My 3 years of Experience
  - As "System Administrator“ of Kathmandu University
- Network Administrator Roles
  - Design
  - Implement
  - Maintain

Network Administrator Career

- United States Bureau of Labor Statistics - $74,270
- Network Company
  - Cisco,Juniper,Oracle,Mikrotik etc
- Internet Service Providers
  - Broadlink,Worldlink,Subisu etc
- Telecom Companies
  - NCELL , NTC , HELLO
- Banks, Networked Institutions
- Cloud Servers
- Web hosting companies and many more.....

Training Contents

- Introduction to Networking [1]
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So Lets get Start !!

- Introduction
- Networking Overview
- Clamping wires
- Switches
- Routers

TCP/IP

- Standard Protocol to provide network connection
- Data split into multiple pieces or "packets"
- TCP vs UDP

IP Address

- Address of networked device
- 32 bits – IPV4
- Dotted Decimal Notation
- Private IP (10.0.0.0 – 10.255.255.255,172.16.0.0 - 172.31.255.255 ,192.168.0.0 - 192.168.255.255)
- Network Address Translation (NAT) Makes Private IPs Public
- Gateway

IP Address

Class	Networks
A	10.0.0.0 through 10.255.255.255
B	172.16.0.0 through 172.31.0.0
C	192.168.0.0 through 192.168.255.0

Classes D, E, and F

Addresses falling into the range of 224.0.0.0 through 254.0.0.0 are either experimental or are reserved for special purpose use and don't specify any network. IP Multicast, which is a service that allows material to be transmitted to many points on an internet at one time, has been as signed addresses from within this range.

Address Resolution

Classes D, E, and F

Addresses falling into the range of 224.0.0.0 through 254.0.0.0 are either experimental or are reserved for special purpose use and don't specify any network. IP Multicast, which is a service that allows material to be transmitted to many points on an internet at one time, has been as signed addresses from within this range.

Introduction contd..

- Static vs Dynamic IP
  - DHCP - Automatically assign IP addresses
- DNS
  - Gives name to IP
- Subnet Mask – Dividing Network
  - 255.255.255.192/26 = 64 address available
  -

Introduction contd.

- If someone gives you an IP address of 97.158.253.28 and a subnet mask of 255.255.255.248, how do you determine the network address and the broadcast address,in other words the boundaries of my network? Here are the steps to do this using both a manual and programmed methodology.
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Introduction contd..

- Subtract the last octet of the subnet mask from 256 to give the number of IP addresses in the subnet. (256 - 248) = 8
- Divide the last octet of the IP address by the result of step 1, don't bother with the remainder , for example (28/8 = 3). This will give you the theoretical number of subnets of the same size that are below this IP address.
- Multiply this result by the result of step 1 to get the network address (8 x 3 = 24). Think of it as "This is the third subnet with 8 addresses in it". The Network address is therefore 97.158.253.24
- The broadcast address is the result of step 3 plus the result of step 1 minus 1. (24 + 8 -1 = 31). Think of it as "The broadcast address is always the network address plus the number of IP addresses in the subnet minus 1". The broadcast address is 97.158.253.31
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Introduction contd..

- Hub - delays
- Switch – MAC based authentication
- Router – More smarter

Introduction contd..

- Firewall provides Secure Environment
  - Throttling traffic to a server when too many unfulfilled connections are made to it
  - Restricting traffic being sent to obviously bogus IP addresses
  - Providing network address translation or NAT
  -

Introduction contd..

- NIC Card
- MAC Address
  - ARP Maps The MAC Address To Your IP Address
  -
- When a DCE is connected to a DTE, you will need a "straight-through" type cable. DCEs connected to DCEs or DTEs connected to DTEs will always require "crossover" cables.

Introduction contd..

- File Transfer Protocol (FTP)
- FileZilla

Clamping(Crimping)

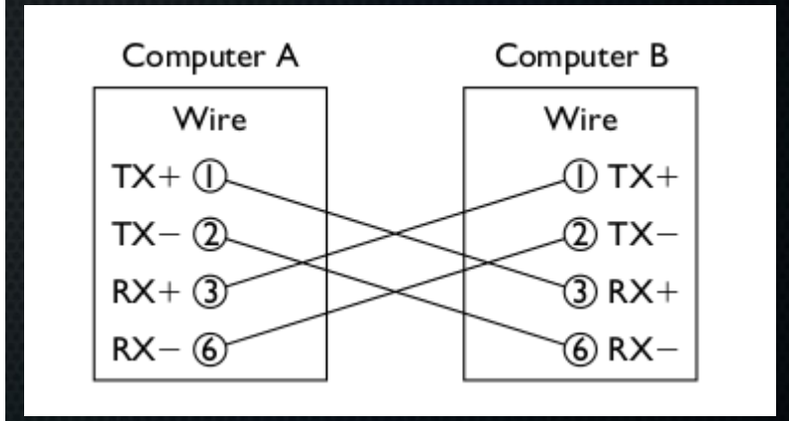
- This was a bit theory , now we'll start with clamping network wires.

UTP Category	Purpose	Transfer Rate
Category 1	Voice only	
Category 2	Data	4 Mbps
Category 3	Data	10 Mbps
Category 4	Data	16 Mbps
Category 5	Data	100 Mbps
Category 5e	Data	1 Gbps (1000 Mbps)
Category 6	Data	10 Gbps

Clamping contd...

- Connection Modes :
  - Crossover cables : connect two computers directly

Wire	Connector #1	Connector #2
1	White wire/orange stripe (white-orange)	White wire/green stripe (white-green)
2	Orange wire	Green wire
3	White wire/green stripe (white-green)	White wire/orange stripe (white-orange)
4	Blue wire	Blue wire
5	White wire/blue stripe (white-blue)	White wire/blue stripe (white-blue)
6	Green wire	Orange wire
7	White wire/brown stripe (white-brown)	White wire/brown stripe (white-brown)
8	Brown wire	Brown wire



Clamping contd...

- Connection Modes :
  - Straight-through cables : connect switch-computer

Wire	Connector #1	Connector #2
1	White wire/orange stripe (white-orange)	White wire/orange stripe (white-orange)
2	Orange wire	Orange wire
3	White wire/green stripe (white-green)	White wire/green stripe (white-green)
4	Blue wire	Blue wire
5	White wire/blue stripe (white-blue)	White wire/blue stripe (white-blue)
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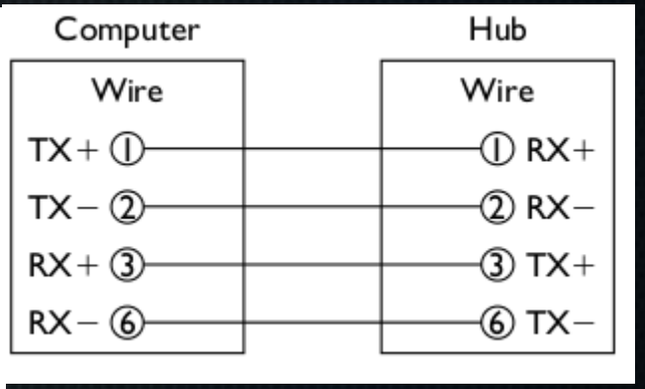

Router Configuration

- Main Page
- Network
- Wireless
- Firewall
- DHCP
- Parental Control
- ACL