Lab 2

Sunday, February 7, 2021 1:59 PM

Router Configuration and Static Routing

Using **packet tracer**: simulator program to see how networks work

CCA certification

1. **Logical workspace**: pick component and design
2. Physical workspace: design for city/building

1. **Real-time mode**: configure switches and PCs and see how communication works
2. Simulation: just a simulator network

Router: in-device
Router connects 2 networks

Component tool-box (bottom window) drag and drop components
- Routers -> Generic router
- Switch ->Generic switch
- End devices -> PC
- Connections -> automatically choose connection type
- Options -> Preferences -> Always show port labels

Switch has 6 fast ethernet ports
Router has 2 fast ethernet ports (parallel connection simultaneous transfer of data) and 2 serial ports (serial connection one by one)

Serial connection between routers

Fa: Fast ethernet

Configure IP addresses to a machine (which class to configure)

Click on PC ->Desktop ->IP Configuration -> static
1. IP address
2. Subnet mask
3. Default gateway

Default gateway: if PC0 wants to communicate with PC2
PC0-S0-R0-R1-S1-PC2
If you want to transfer data outside network, contact the gatekeeper (router)

Router 0 is gateway for PC0
Router 1 is gateway for PC1
Default gateway -> router address

IPv4 address format
Dotted decimal 32-bit
128.11.3.31
8 bit for each
Classes:

A	0-127	0…
B	128-191	10…
C	192-223	110..
D	224-299	1110..
E	240-255	1111..

A,B,C used for networking
D(multicast), E(future use) are special class of IP addresses

To transmit data to another network, you need to know address of the network and to which host
Every IP address is divided into :

1. Network ID
2. Host ID

Different bytes allotted to each ID according to classes

Default mask (subnet mask):
Class A: 255.0.0.0
Class B: 255.255.0.0
Class C: 255.255.255.0
Class D, E no mask

Use?

- To find out the network address using host address
- Router should which is which (router knows IP address, apply mask and get network address)
- Destination address AND default mask = network address

Destination address	201	24	67	32
Mask	255	255	255	0
Network address	201	24	67	0

Operation takes place inside the router

Switches work at data link layer (no IP address, work as central controller)(no configuration inside switches)

Routers have limited ports (multiple end devices connected to router via switches which simply forwards messages)

Routers work on network layer

Click on router -> CLI -> no for config dialog ->

Real-time commands
Router works in

1. Switch on with *enable*
2. Default privilege mode -> config mode with *configure terminal*
3. *Interface FastEthernet 0/0* configure connection Fa0/0 into the router (0/0 is name of port)
   Interface Serial 2/0 (configure serial 2/0 of router)
4. *ip address 10.0.0.1 255.0.0.0* configure IP address and mask
5. *no shutdown* changes links to active
6. *exit* (exit config-if)
7. *exit* (exit config)

ip route 10.0.0.0 255.0.0.0 192.168.0.243
Adding the two addresses to the route table to transfer data