NETWORK FUNDAMENTALS

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ROUTERS

- What is router?
- It is a network device used to connect many devices.Function of a router is to find the best path to transfer a packet.
- Topics:
- Router ports , router rules , router modes , router basic configuration

FUNCTIONS

- THE MAIN FUNCTION OF A ROUTER IS TO FIND THE BEST PATH.
- WHAT DIFFERENCE DOES IT MAKE TO HAVE A ROUTER?
- Bandwidth utilisation - We use router to use maximum of our bandwidth without any loss. If our internet speed is 10 mbps, we can use the maximum of that with router, and incase if we use a modem we will have loss.
- Incase if we dont have a router, our isp will take care of routing needs.

ROUTER PORTS

- **INTERFACE** - used to connect a router with other devices (router, Switch)
- Ex:
- -Ethernet interface - Old and Slow - Eth
- -Fast ethernet interface - Fast and new - Fe
- -Gigabit ethernet interface - Very fast and advanced - Ge
- All the above 3 will look the same. (RJ45 port), but differs in speed -
- -Serial Interface
- Used to connect two routers.

- **LINE** - used to configure a router
- Types of line
- - Console port (CON)
- used for direct configuration
- - Auxiliary port (AUX)
- used for remote configuration
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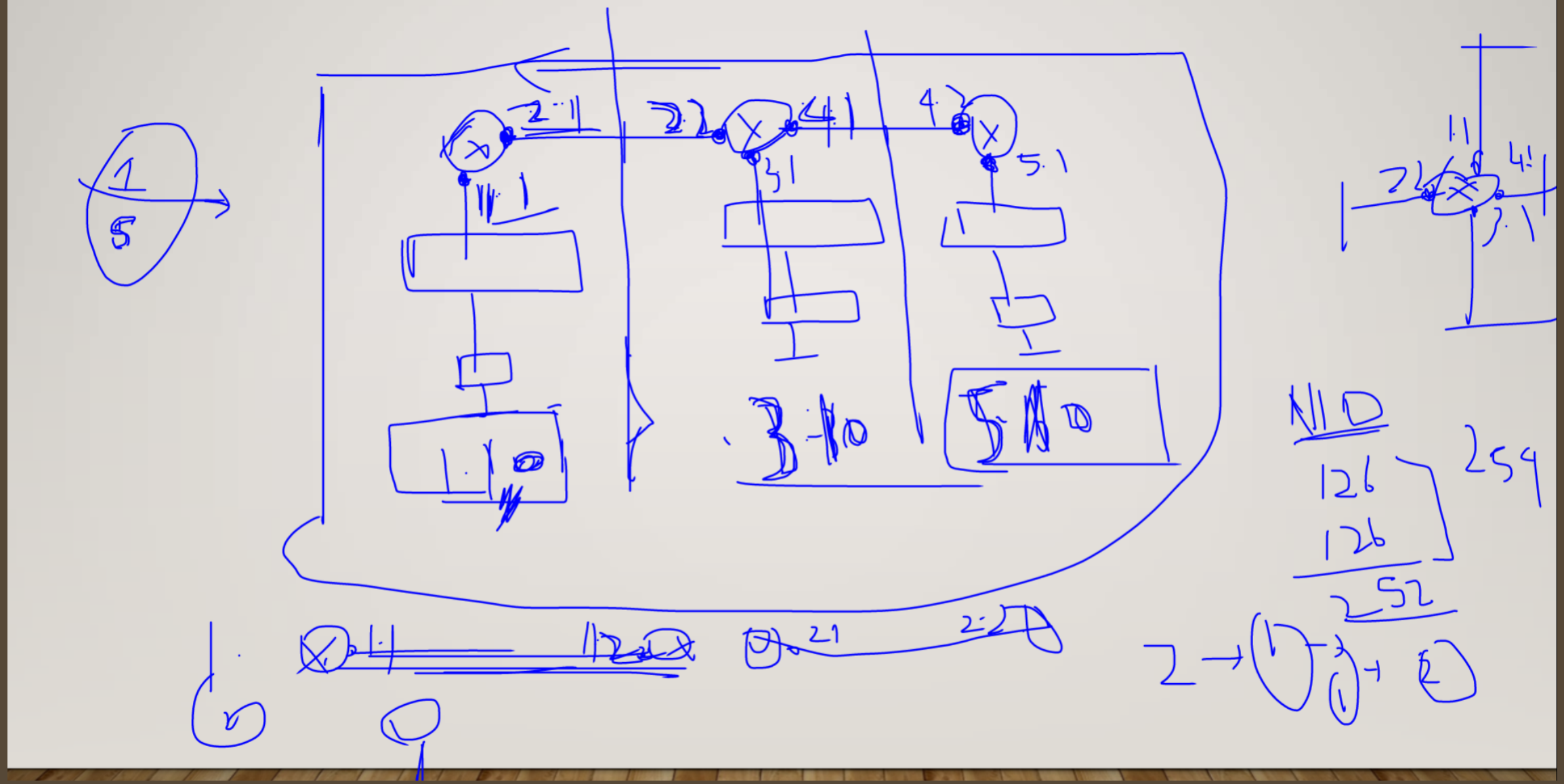
ROUTER RULES

- Rule 1 - All interfaces of a router should be in different network | should have different NID
- Rule 2 - A serial interface connecting two routers should be in same network | should have same NID.


1
5
2.1
2.2
4.1
4.2
5.1
3.1
1.1
3.10
5.10
1.1
4.1
2.1
3.1
NID
126
126
252
254

ROUTER MODES

- Router Modes - User Mode, Previledge Mode, Global Configuration Mode
- 1.User Mode
- **Router >**
- Its just a login mode, we cannot configure anything in this mode.
- To enter into next mode,
- Router > enable or
- Router > en

PREVILEDGE MODE

- **Router #**
- This mode we cannot configure anything in router, but we can see what is already configured in router using SHOW command
- We use this mode for Troubleshooting
- In order to go to the next mode

GLOBAL CONFIGURATION MODE

- **Router(config)#**
- All router configurations can be made in this mode.

BASIC CONFIGURATION

- Router> enable
- Router# configure terminal
- Router(config)# Interface fastethernet 0/0
- int fas
- tab is to complete the command
- Router(config-if)# ip address 192.168.1.1 255.255.255.0
- Router(config-if)# no shutdown

ROUTING

- Process of making two routers communicate with each other Or Process of filling IP tables either manually or automatically.
- **TYPES OF ROUTING**
- A. STATIC ROUTING
- -Process of filling ip tables with **UNKNOWN NID / NETWORKS.**
- -Configured for smaller networks
- B. DYNAMIC ROUTING
- -Process of filling ip tables with **KNOWN NID / NETWORKS.**
- -Configured for larger networks

STATIC ROUTING

- We need to enter Unknown network ids
- When we configure static routing in router, we get the following options

What we will see in static routing:

- Network - Network ID
- Mask - Subnet Mask
- Next Hop - IP address