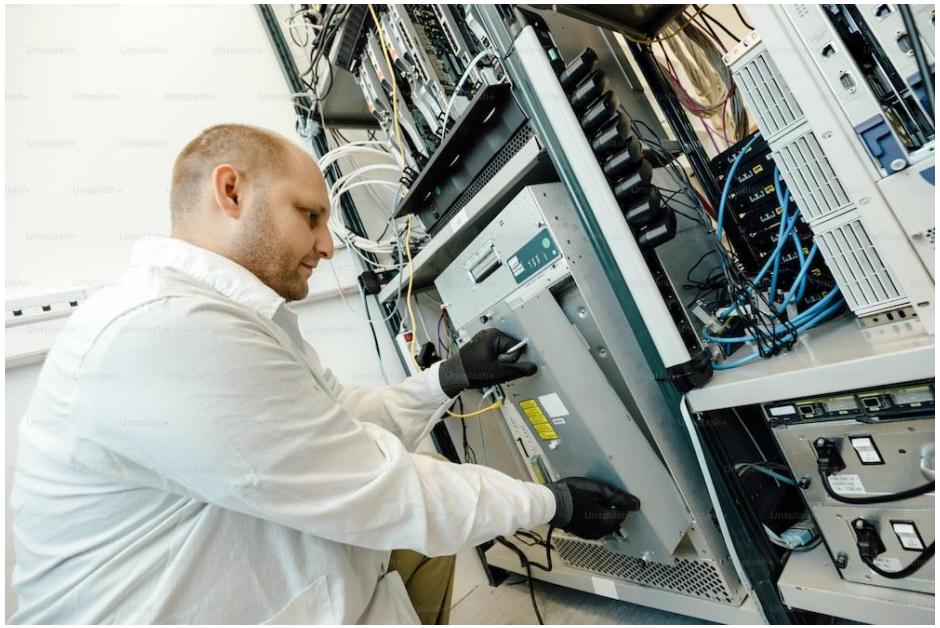
IP Addresses and Host-to-host Communication – part 2

Lecture 3



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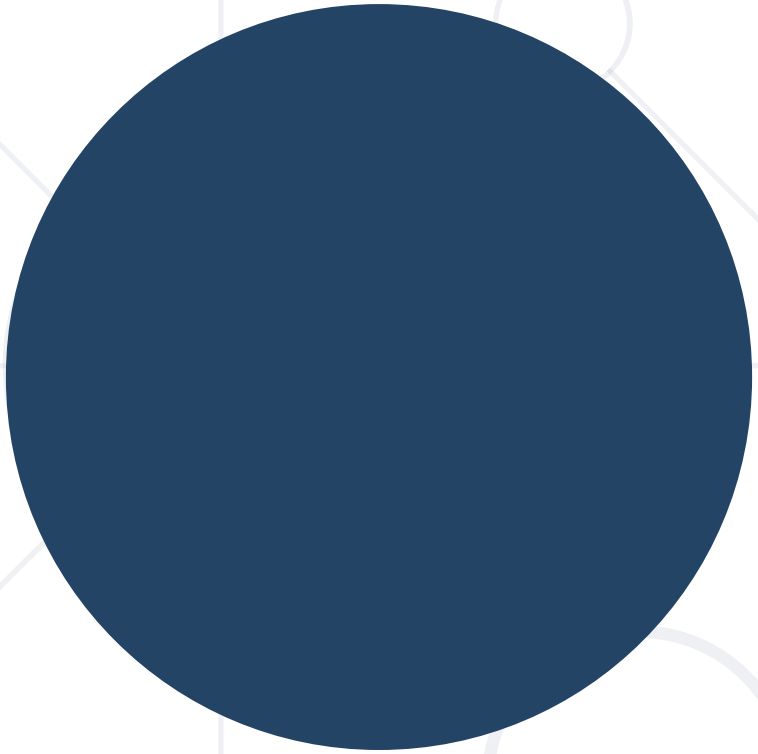
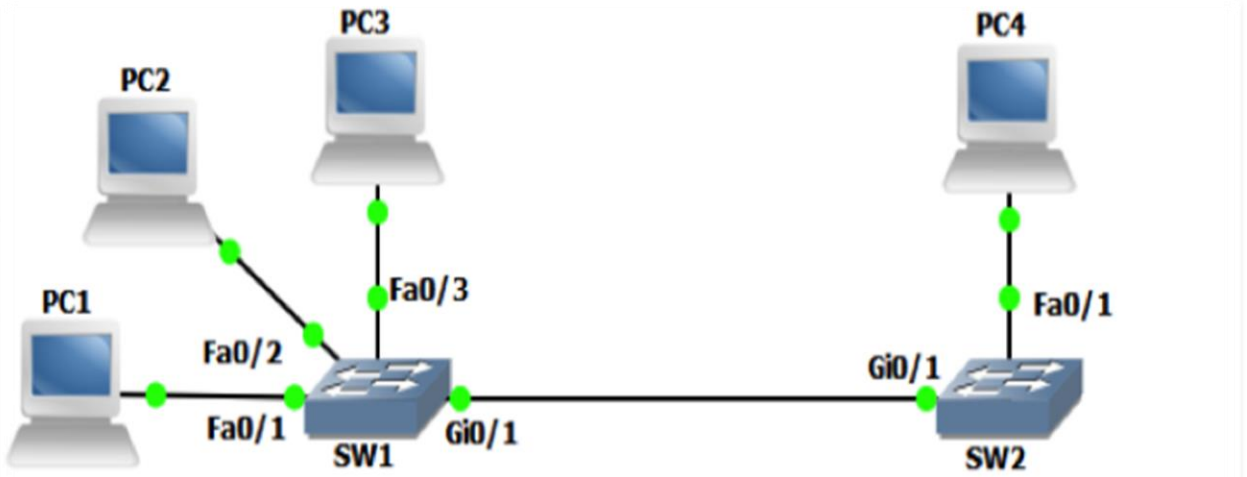


Switch MAC address table

The MAC address table



SW1# show mac address-table dynamic
Mac Address Table

Vlan	Mac Address	Type	Ports
20	0200.1111.1111	DYNAMIC	Fa0/1
20	0200.2222.2222	DYNAMIC	Fa0/2
20	0200.3333.3333	DYNAMIC	Fa0/3

SW2# show mac address-table dynamic
Mac Address Table

Vlan	Mac Address	Type	Ports

- It is a (dynamic) table that maps MAC addresses to ports
- Used to find the proper interface when the switch forwards a packet

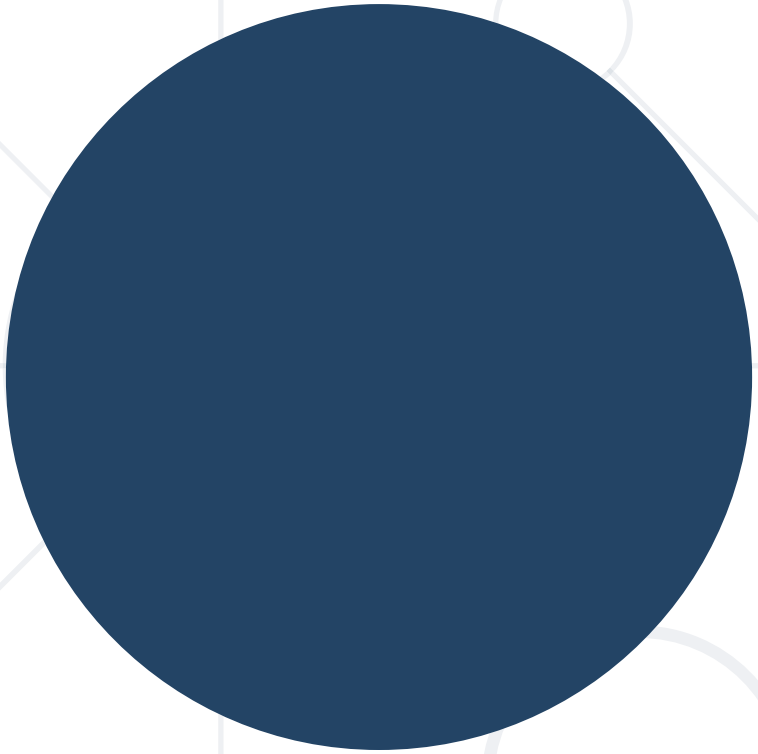
The MAC address table (2)

- You can assign MAC Address statically as well
  - Pros: It is more secure
  - Cons: It is bit slower and harder for sysadmin to assign it manually

```
SW1#show mac-address-table
          Mac Address Table
-------------------------------------------

Vlan    Mac Address       Type        Ports
----    -----------       --------    -----

   1    1111.1111.1111    STATIC      Fa0/2
```

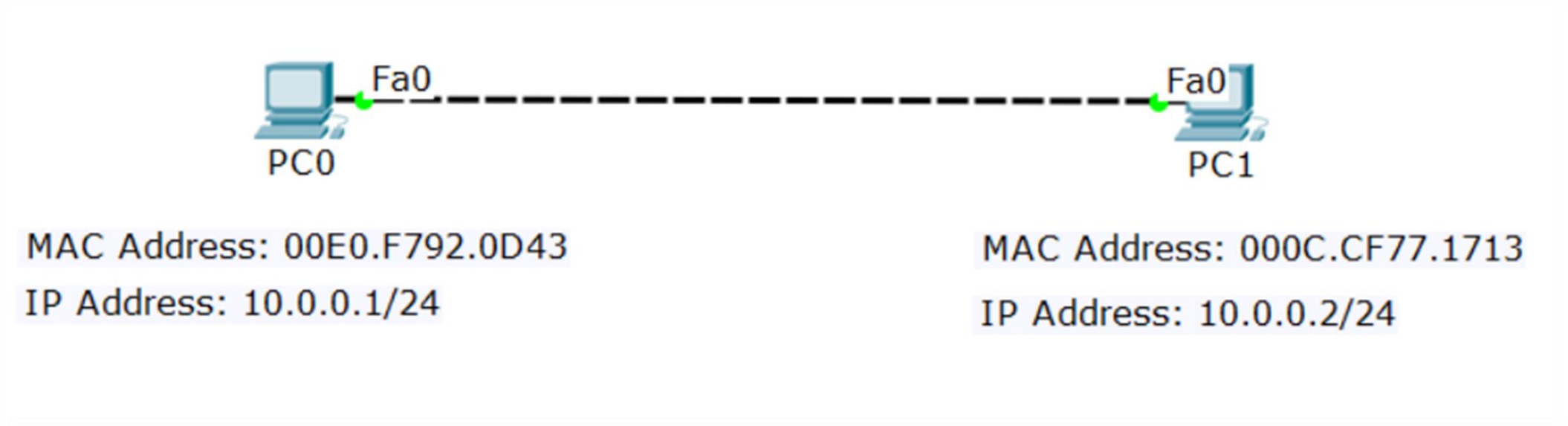


Host-to-host communication with routers

Four addresses required

- There are 4 addresses needed for Ethernet communication:

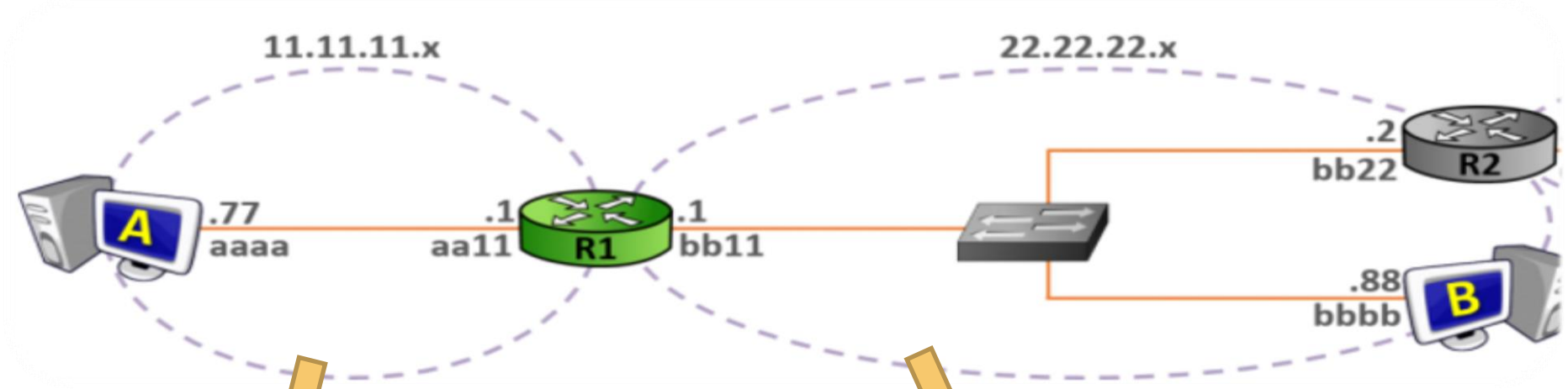
▪ Source IP	▪ Destination IP
▪ Source MAC	▪ Destination MAC

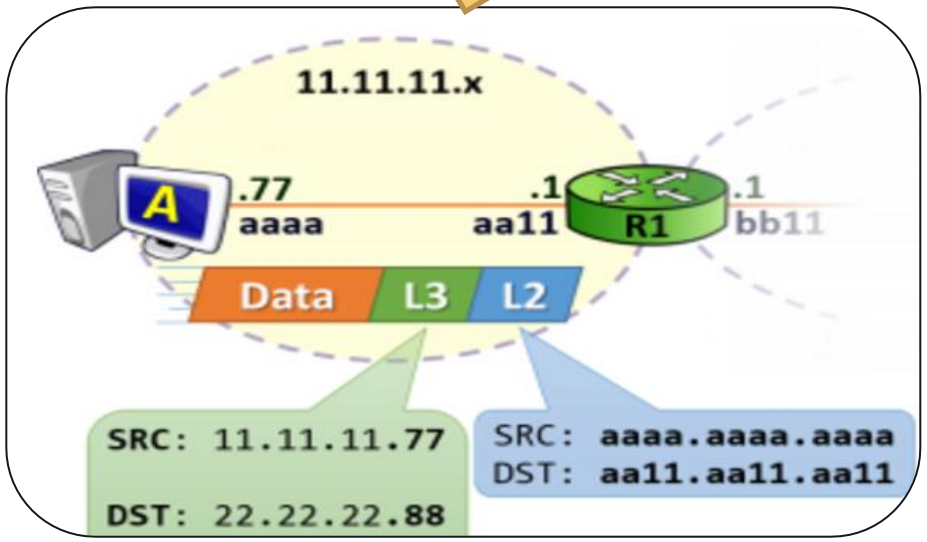


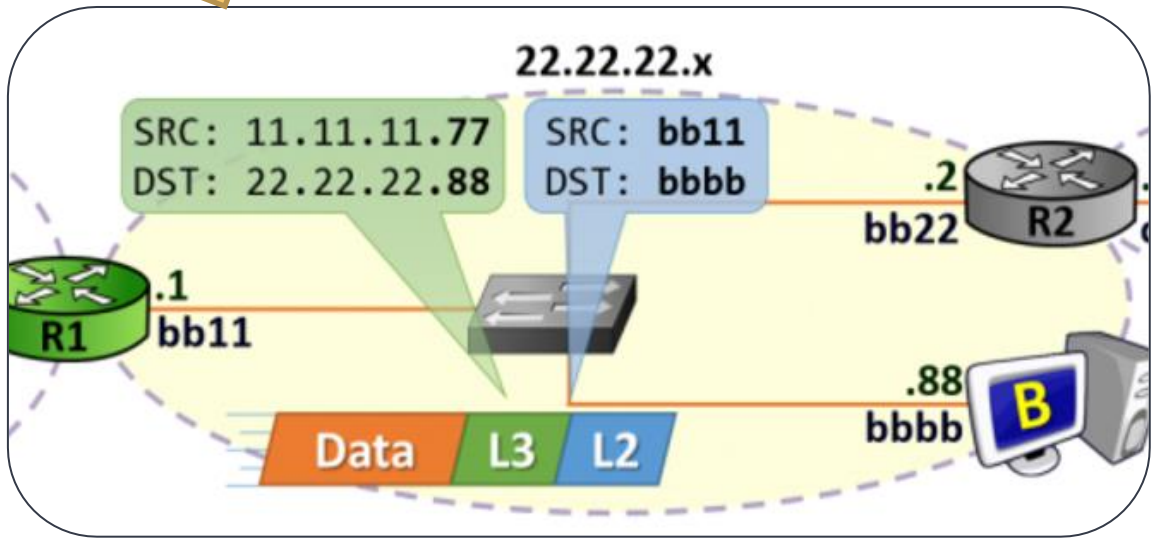
Host-to-host communication with routers

- Source and destination MAC addresses are changed at every hop (router)
- Source and destination IP addresses are constant
  (if we do not use NAT)

Host-to-host communication with routers (2)

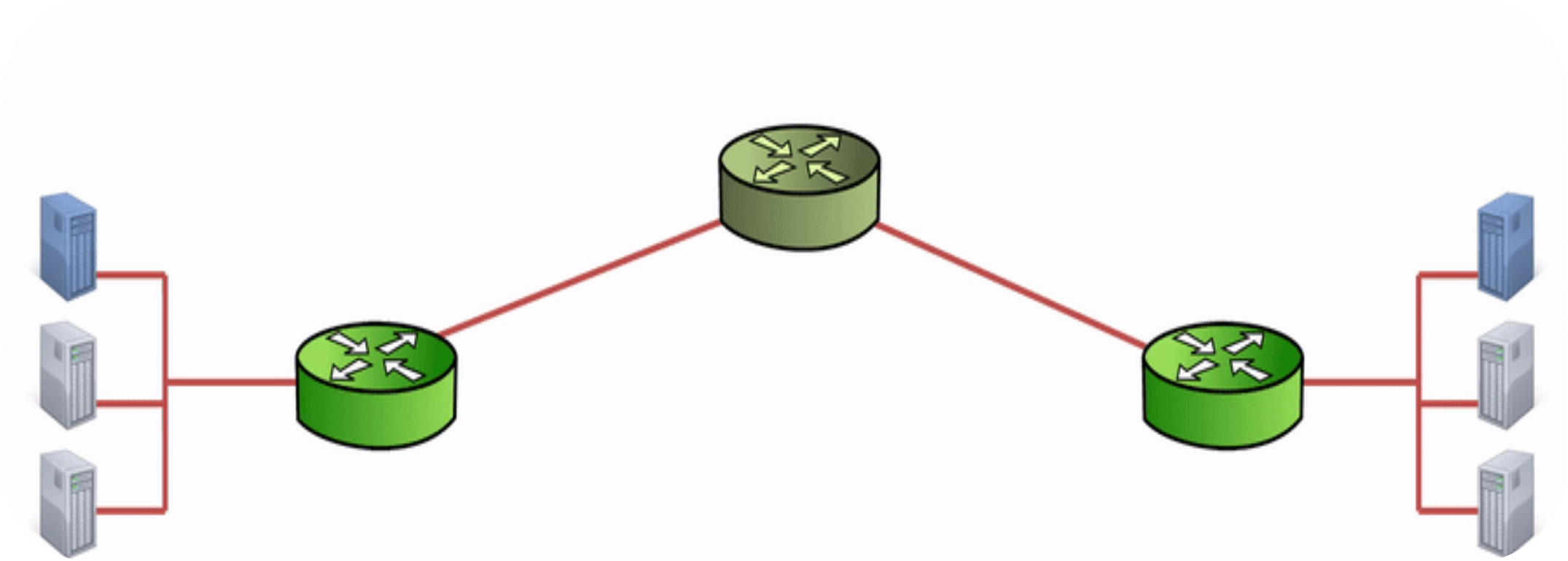


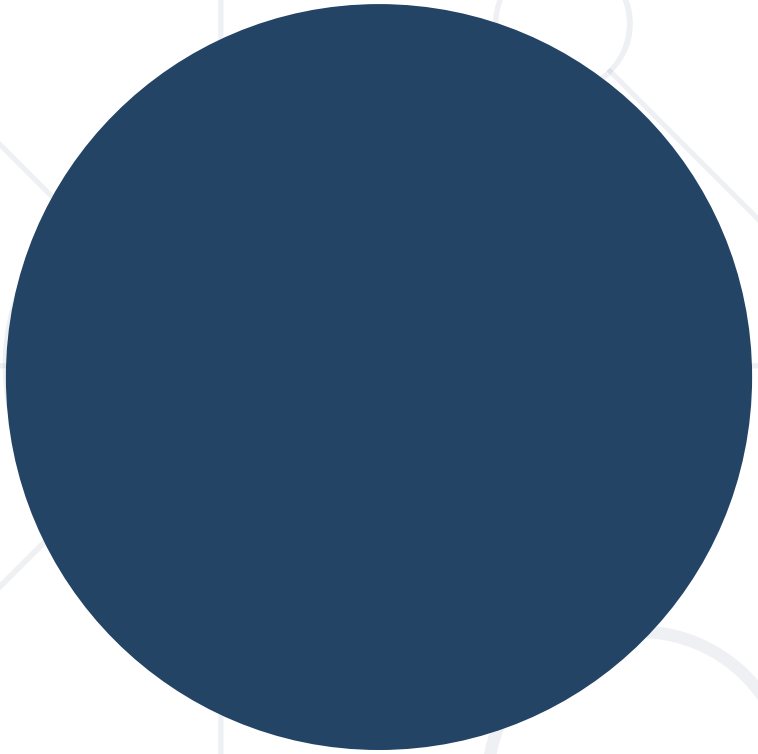




Host-to-host communication with routers (3)

- Source and destination MAC addresses are changed at every hop/router





Device memory components

Main memory components in a network device

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- RAM (Random Access Memory)
  - stores the running configuration file
  - loses content when the power goes down
- NVRAM (NonVolatile RAM)
  - stores the startup configuration file
  - retains content when the power goes down

Main memory components in a network device (2)

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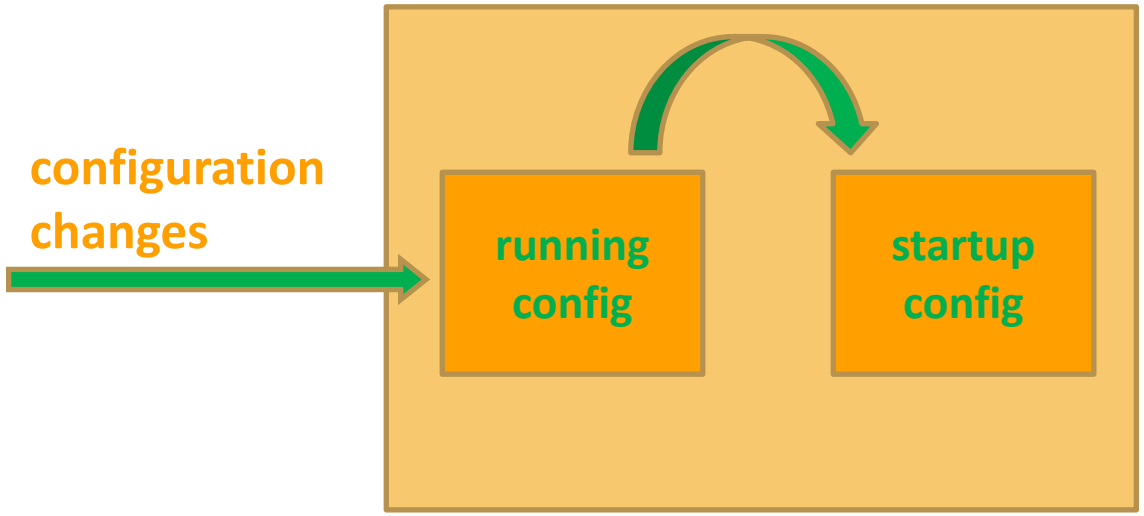
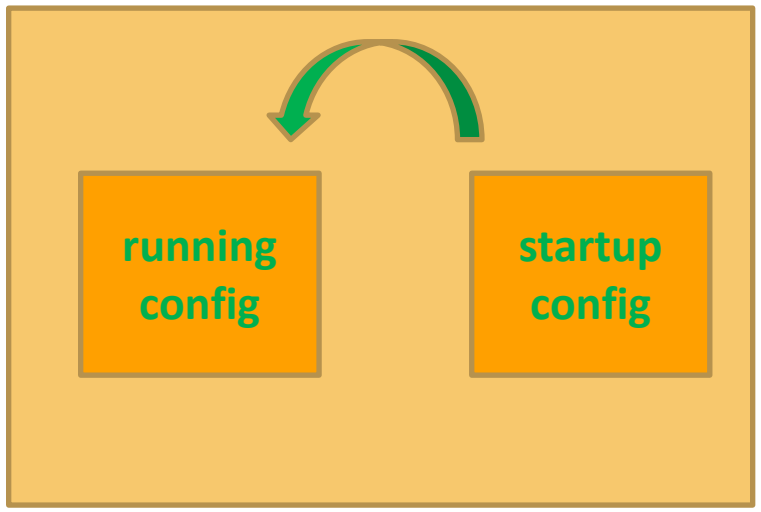
- Flash memory
  - stores the device image (operating system)
  - retains content when the power goes down
- ROM (Read-Only Memory)
  - maintains instructions for power-on self test (POST) diagnostics
  - Stores bootstrap program and basic operating system software
  - retains content when the power goes down

Saving the configuration

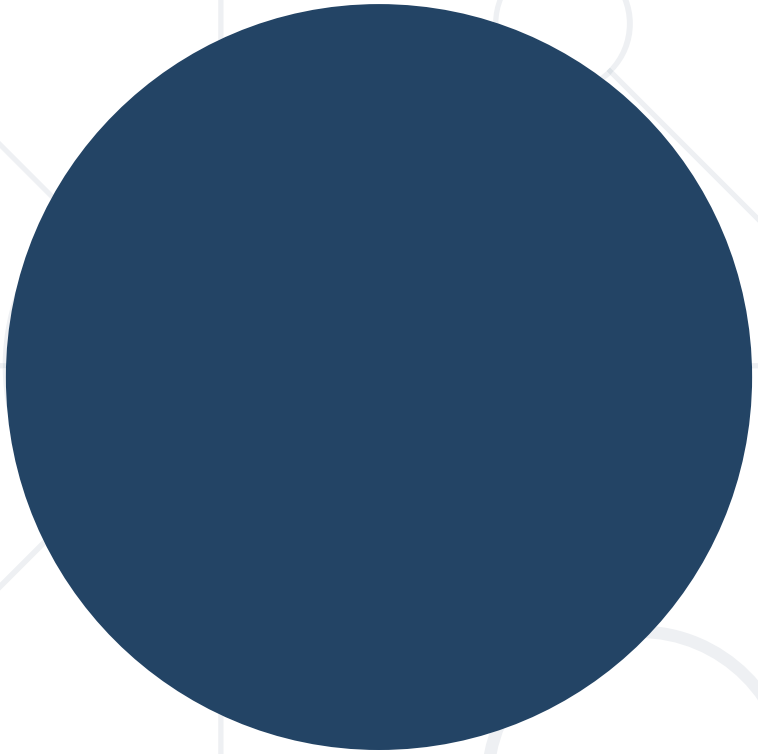


- The configuration file must be saved to survive reboot
- To save the running configuration file (stored in RAM) to the startup configuration file (stored in NVRAM), use either:
  - copy run start
  - write memory

Loading the configuration



- The saved configuration file (startup config file) will go in the RAM (the running config file) when:
  - the device is restarted
  - a copy start run command is executed



Demonstration

Summary

1. Switch MAC Address table
2. Host-to-Host communication with routers
3. Device memory components
4. Demo

Questions?

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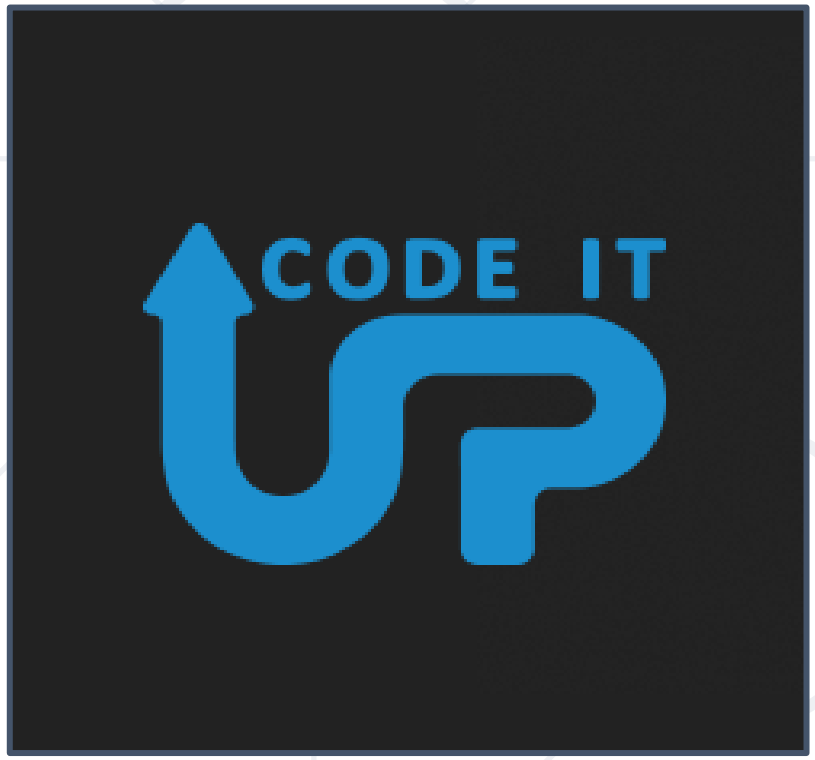

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