

Lab#3 Announcement

- Here is the Zoom link for today online lab (9:00-12:00, 2/4/25):
<https://chula.zoom.us/j/91656907642?pwd=zzVGIYwe7PsoYIzLaUafVauL41yYRO.1>
- Please rename to ***StudentID_Firstname***, your attendance will be checked later in class (via mCV attendance check link)
- Each lab lecture session will take place at **the Main meeting room** according to the lab schedule
- There will be 32 breakout rooms, please join **the room with the same number** as your group number in mCV
- TAs will be standing by at **the Main meeting room** for any questions (also join into your breakout room, if requested)
- We will use Discord for further communication
- Attendance Check - 9:15

Computer Network Lab #3

Schedule & Content

- 09:00 – 10:00 [60 mins] [Provided Packet Tracer]
 - Lab 6.1: Configuring Basic Router Settings with IOS CLI
- 10:20 – 11:05 [45 mins] [Provided Packet Tracer]
 - Lab 6.2: Configuring IPv4 Static and Default Routes
- 11:05 – 11:50 [45 mins] [Provided Packet Tracer]
 - Lab 7: Configuring Basic Single- Area OSPFv2

Agreement

- All of those who late than 15 minutes is considered to be absent. (50% will be deducted)
- Lab assignments must be submitted by deadline (Any late submission 50% will be deducted)

Lab 6.1 Configuring Basic Router Settings with IOS CLI

[Provided Packet Tracer]

09:00 – 10:00 [60 mins]

Objectives

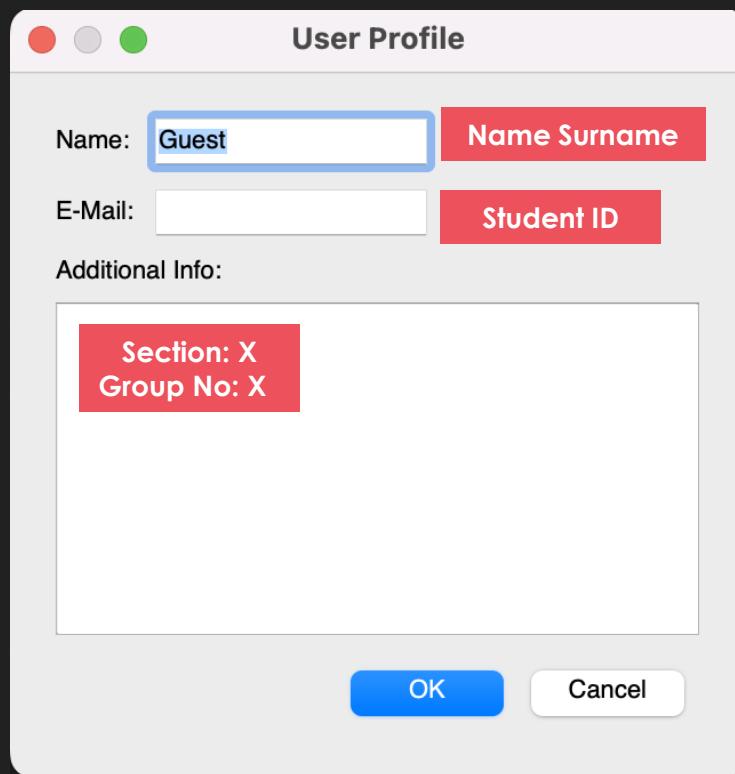
- Set Up the Topology and Initialize Devices
- Configure Devices and Verify Connectivity
- Display Router Information

Packet Tracer file

- Download Packet Tracer File from myCourseVille

(1/3) User Profile Setting

Press Ctrl(Cmd)+Shift+U to Open User Profile Dialog



These information
cannot be
changed, otherwise
all the activities will
be reset.

(2/3) Assessment

PT Activity: 00:00:1 Lab Instruction

with IOS SIM

Topology

PC-A is connected to Switch S1 via interface F0/6. Switch S1 is connected to Router R1 via interface F0/5.

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default
R1	G0/0	192.168.0.1	255.255.255.0	N/A
	G0/1	192.168.1.1	255.255.255.0	N/A

Completion: 4% | Back | 1/1 | Next | Check Results | Top | Done

Completion %

Activity Results Time Elapsed: 00:02:39

You did not complete the activity. Please close this window and try again.

Overall Feedback [Assessment Items](#) [Connectivity Tests](#)

Expand/Collapse All Show Incorrect Items

Component	Items/Total	Score
Ip	0/10	0/10
Other	0/10	0/10
Physical	2/23	2/23

Score : 2/43 Item Count : 2/43

Assessment Items

Assessment Items	Status	Points	Component(s)	Feedback	
Network					
PC-A	✗ Default Gateway	Incorrect	1	Ip	
	Ports				
	FastEthernet0	✗ IP Address	Incorrect	1	Ip
		✗ Connects to FastEthernet0/6	Incorrect	1	Physical
		✗ Type	Incorrect	1	Physical
		✗ Subnet Mask	Incorrect	1	Ip
PC-B	✗ Default Gateway	Incorrect	1	Ip	
	Ports				
	FastEthernet0	✗ IP Address	Incorrect	1	Ip
		✗ Connects to GigabitEthernet0/0	Incorrect	1	Physical
		✗ Type	Incorrect	1	Physical
		✗ Subnet Mask	Incorrect	1	Ip
R1	✗ Banner MOTD	Incorrect	1	Other	
	Console Line	✗ Logging Synch	Incorrect	1	Physical
		✗ Login	Incorrect	1	Physical
		✗ Password	Incorrect	1	Other
		✗ Terminal Line timed out	Incorrect	1	Physical
DNS	✗ IP Domain-Lookup	Incorrect	1	Other	
	✗ Enable Secret	Incorrect	1	Other	
	✗ Host Name	Incorrect	1	Other	
Ports					
	GigabitEthernet0/0	✗ Description	Incorrect	1	Other
		✗ IP Address	Incorrect	1	Ip
		✗ Connects to FastEthernet0	Incorrect	1	Physical
		✗ Type	Incorrect	1	Physical

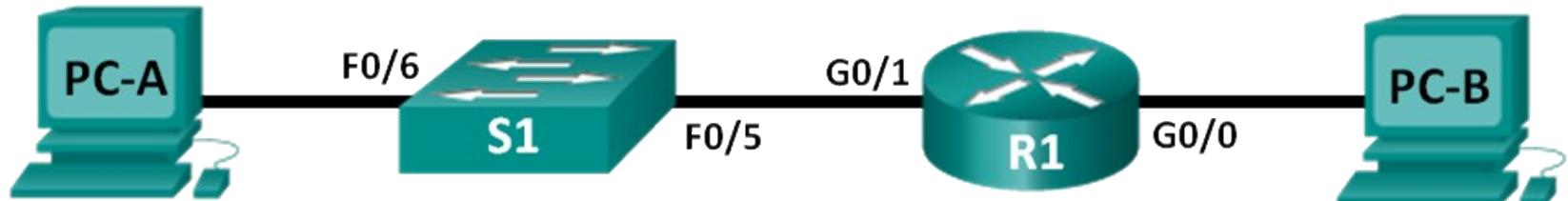
Close Assessment Items

(3/3) How to use Packet Tracer file

- Devices used in each lab assignment (e.g. switch, router and PC) have been already provided
 - **DO NOT** add or remove any devices
- 1. Set the user profile
 - Cannot be changed later, otherwise all the activities **will be reset**
- 2. Select the appropriate cable type and connect it to each device
 - Corresponding to the network topology and the addressing table
- 3. Complete device configuration according to the lab instruction
 - Review: “**Lab1. Packet Tracer Tutorial & Build a Simple Network**”
- 4. Check the completion percentage and assessment items
- 5. Save and submit file

Topology and Devices

Topology

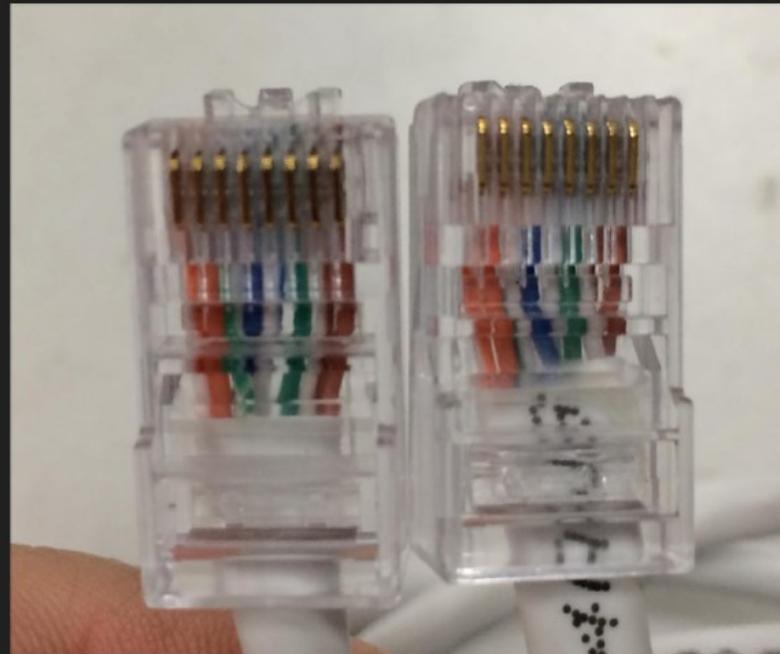


- 2 PCs
- 1 Switch
- 1 Router
- Console Cable
- Ethernet Cable
 - 2 Straight-Thru
 - 1 Crossover

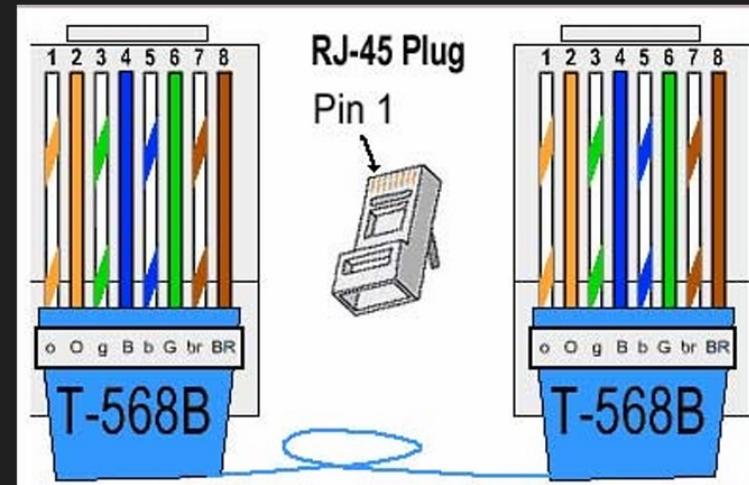
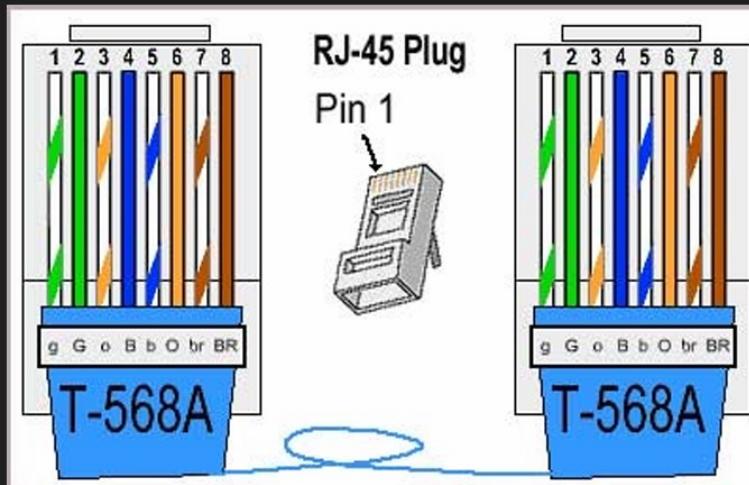
Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	192.168.0.1	a) _____	N/A
	G0/1	b) _____	255.255.255.0	N/A
PC-A	NIC	192.168.1.3	c) _____	192.168.1.1
PC-B	NIC	192.168.0.3	255.255.255.0	d) _____

Ethernet Cable



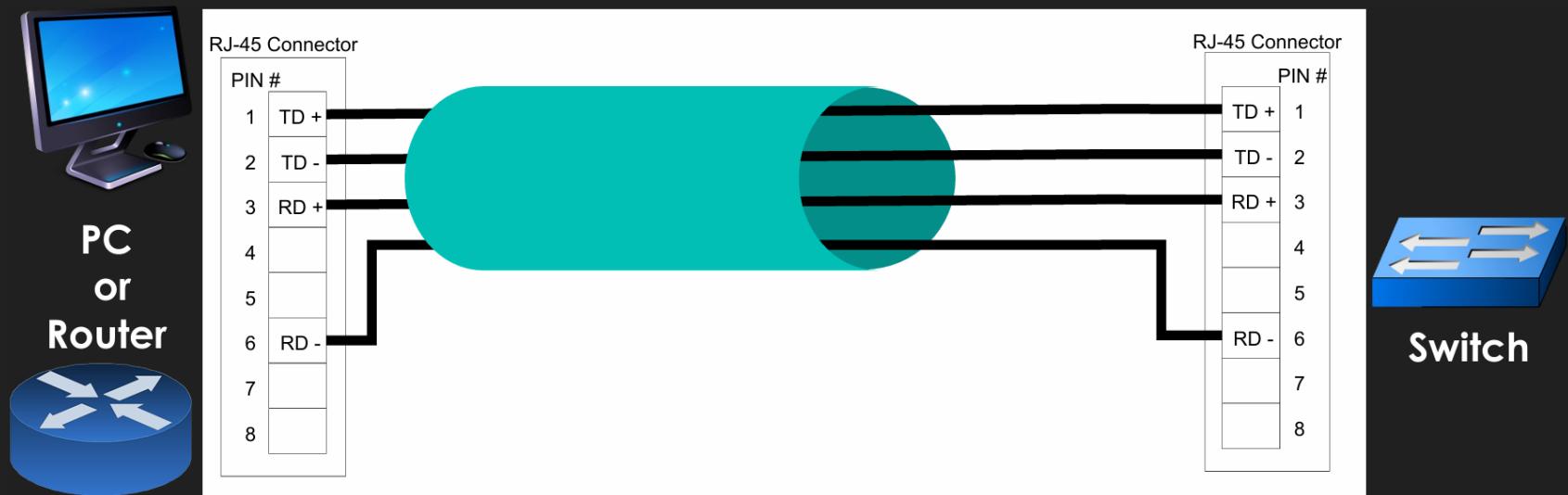
Ethernet Straight-Thru Cable



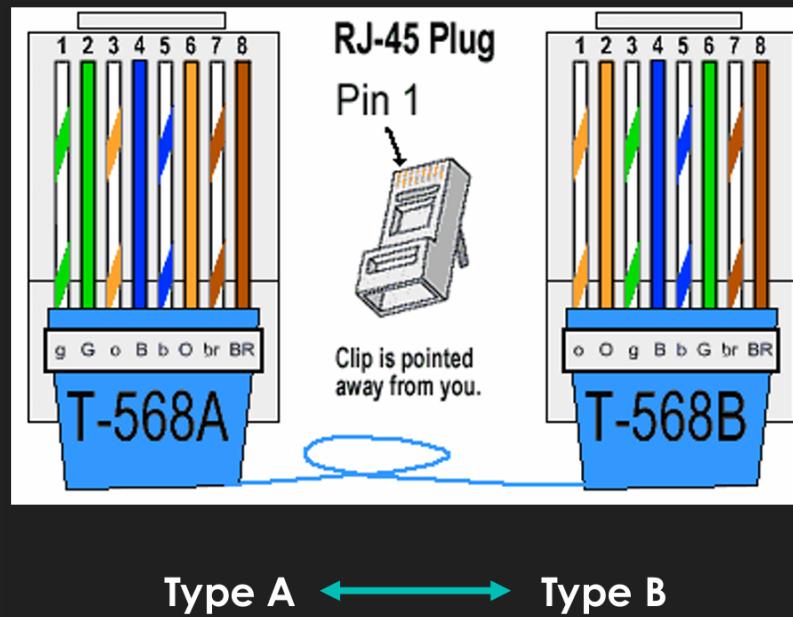
Type A Type A

Type B Type B

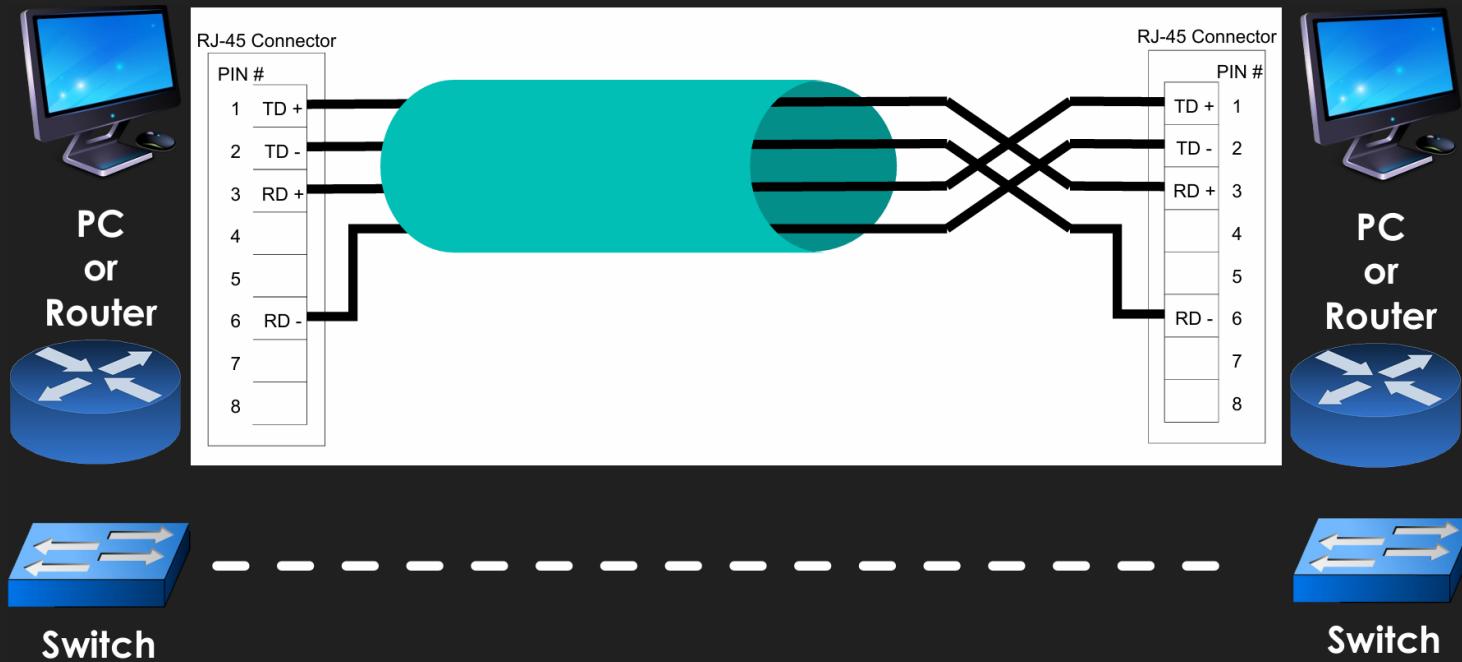
Ethernet Straight-Thru Cable



Ethernet Crossover Cable



Ethernet Crossover Cable



Set Up the Topology and Initialize Devices

1. Cable the network as shown in the topology
 - Attach the devices as shown in the topology diagram, and cable as necessary
 - Power on all the devices in the topology
2. Initialize and reload the router and switch
3. Do NOT clean up your configuration

Configure the Router

- Enter privilege mode
- Enter global configuration mode
- Assign a device name
- Disable DNS lookup (prevent incorrect entered command translation)
- Assign **privileged EXEC** encrypted password

Configure the Router

- Assign **console password**, establish a timeout, enable login, and add the logging synchronous command
- Assign **vty password**, establish a timeout, enable login, and add the logging synchronous command
- Encrypt the clear text passwords
- Create a banner that warns anyone accessing the device

Configure the Router

- Configure an IP address and interface description

```
R1(config-if)# int f0/1  
R1(config-if)# description Connection to S1  
R1(config-if)# ip address 192.168.1.1  
255.255.255.0
```

- Activate both interfaces on the router

```
R1(config-if)# no shutdown
```

Configure the Router

- Set the clock on the router
- Save the running configuration to the startup configuration file

Configuration Guide

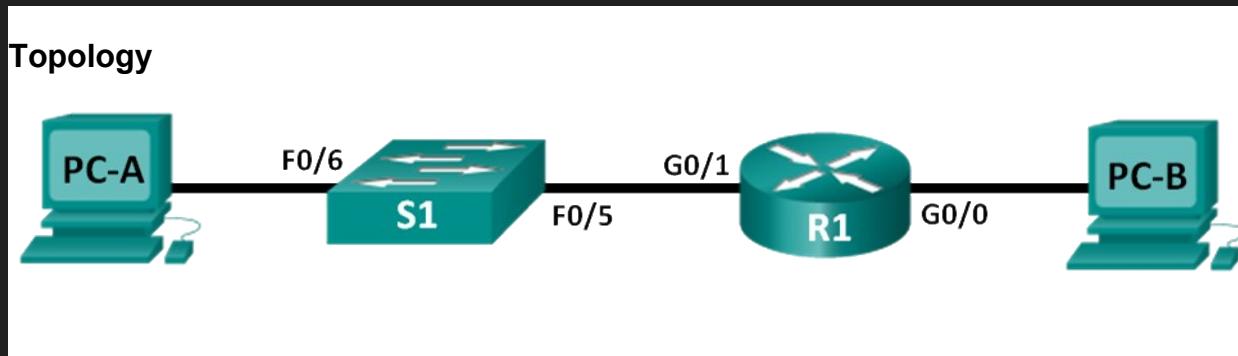
- R1> (Console mode)
- R1# (Privilege mode)
- R1 (config) # (Global configuration mode)
- R1 (config-if) # (Interface configuration mode)

Configuration Guide

```
○R1> enable  
○R1# config terminal  
○R1(config)# int [interface-name]  
○R1(config-if)# exit  
○R1(config)# exit  
○R1# exit  
○R1>
```

Verify Connectivity

- Ping PC-B from PC-A
- Remotely access R1 from PC-A using Putty Telnet
 - 1) Use CLI `telnet [host-address]` in Command Prompt
 - 2) Use PuTTY Telnet Client (GUI)



Display router information

- Show version
- Show startup-config
- Show ip route
- Show ip interface brief

Lab 6.1 Configuring Basic Router Settings with IOS CLI

กระจายตาม breakout room กด **ตัวเองครับ** / เป็น Individual Assignment

มีคำถาม สามารถ **เข้ามาถามหรือตอบ TA** ใน main meeting room ครับ

10:20 จะดึงทุกคนกลับมา main meeting room เพื่อ **ฟัง brief** และถัดไปครับ

○ Video Clip

- Lab6.1.Configuring Basic Router Settings with IOS CLI

○ Materials

- Slide ([#3] Lab #3 Slide)
- Lab sheet ([#3] Lab 6.1 Configuring Basic Router Settings with IOS CLI)
- Packet Tracer File ([#3] Lab 6.1 [Packet Tracer] Configuring Basic Router Settings with IOS CLI)

○ Submission

- **Individual** Assignment ([#3] Lab 6.1: Answer Sheet)
 - **Answer** the question set on mCV
 - **Upload** your Packet Tracer File



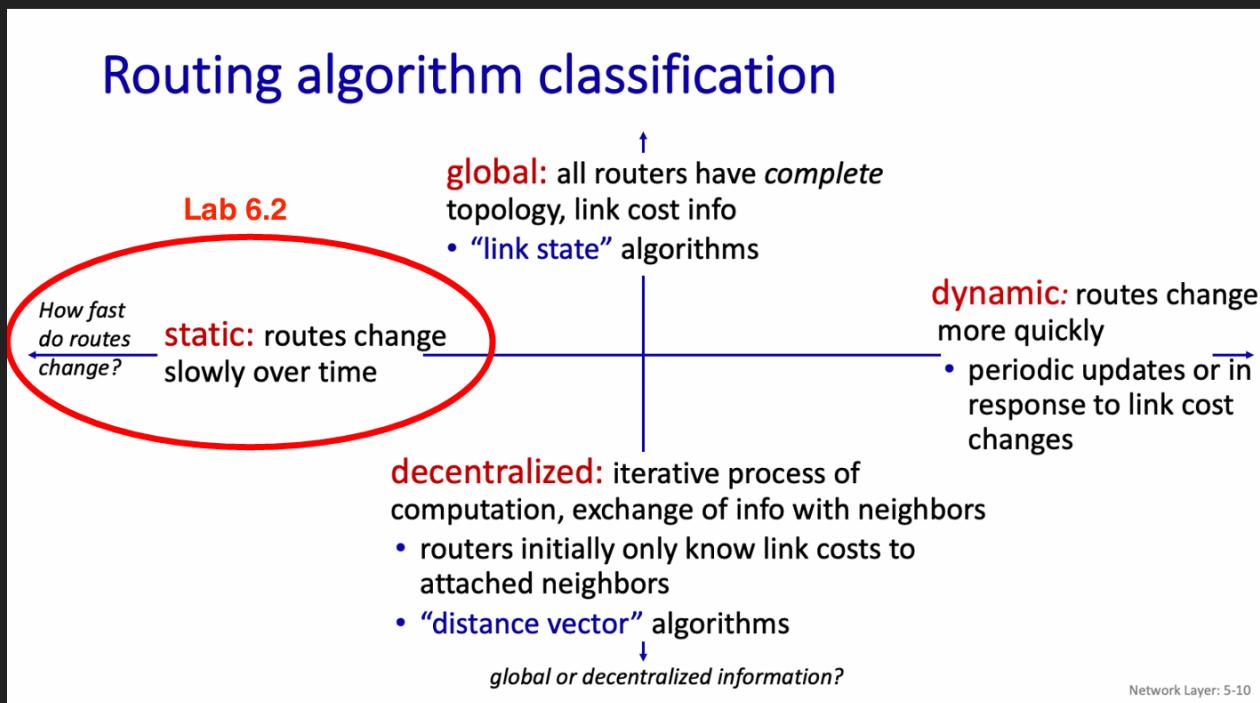
Please practice using the Packet Tracer file by yourself, as the final test will require you to complete tasks on your own.

Lab 6.2 Configuring IPv4 Static and Default Routes

[Provided Packet Tracer]

10:20 – 11:05 [45 mins]

Routing algorithm classification



Objectives

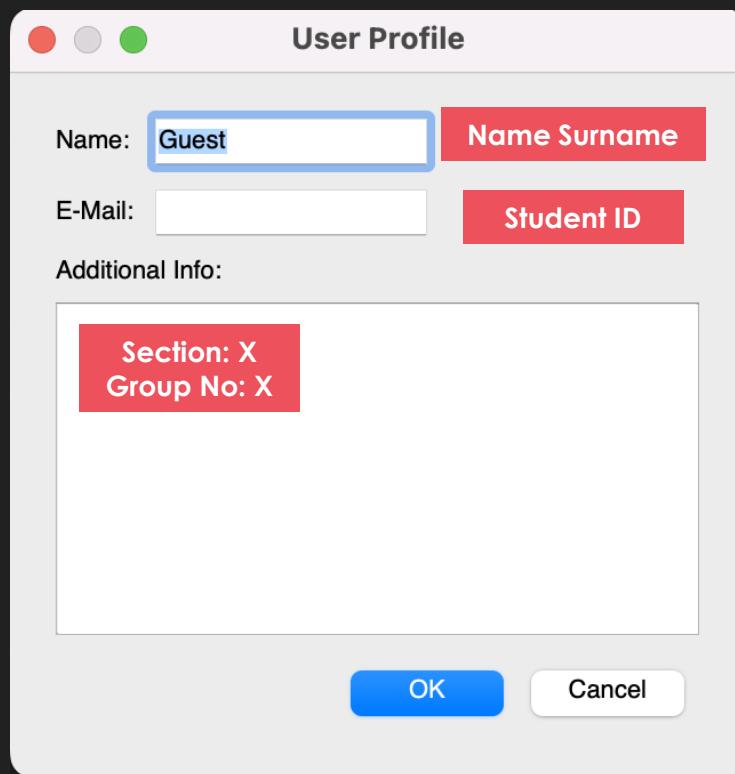
- Set Up the Topology and Initialize Devices
- Configure Basic Device Settings and Verify Connectivity
- Configure Static Routes
- Configure and Verify a Default Route

Packet Tracer file

- Download Packet Tracer File from myCourseVille

(1/3) User Profile Setting

Press Ctrl(Cmd)+Shift+U to Open User Profile Dialog



These information
cannot be
changed, otherwise
all the activities will
be reset.

(2/3) Assessment

PT Activity: 00:00:1 Lab Instruction

Topology

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default
R1	G0/0	192.168.0.1	255.255.255.0	N/A
	G0/1	192.168.1.1	255.255.255.0	N/A

Completion %

Check Results

Time Elapsed: 00:00:00 Completion: 4%

Activity Results

You did not complete the activity. Please close this window and try again.

Overall Feedback [Assessment Items](#) [Connectivity Tests](#)

Score : 2/43 Item Count : 2/43

Component	Items/Total	Score
Ip	0/10	0/10
Other	0/10	0/10
Physical	2/23	2/23

Assessment Items

Category	Item	Status	Points	Component(s)	Feedback	
Network	PC-A	Incorrect	1	Ip		
	Ports	FastEthernet0	Incorrect	1	Ip	
	IP Address	Link to S1	Incorrect	1	Physical	Connects to FastEthernet0/6
	Type	Subnet Mask	Incorrect	1	Ip	
PC-B	Default Gateway	Incorrect	1	Ip		
	Ports	FastEthernet0	Incorrect	1	Ip	
	IP Address	Link to R1	Incorrect	1	Physical	Connects to GigabitEthernet0/0
	Type	Subnet Mask	Incorrect	1	Ip	
R1	Banner MOTD	Incorrect	1	Other		
	Console Line	Logging Synch	Incorrect	1	Physical	
	Login	Terminal Line timed out	Incorrect	1	Physical	
	Password		Incorrect	1	Other	
	DNS	IP Domain-Lookup	Incorrect	0	Other	
	Enable Secret	Host Name	Incorrect	1	Other	
	Ports	GigabitEthernet0/0	Incorrect	1	Other	
	Description	IP Address	Incorrect	1	Ip	
Link to PC-B	Connects to FastEthernet0	Incorrect	1	Physical		
Type		Incorrect	1	Physical		

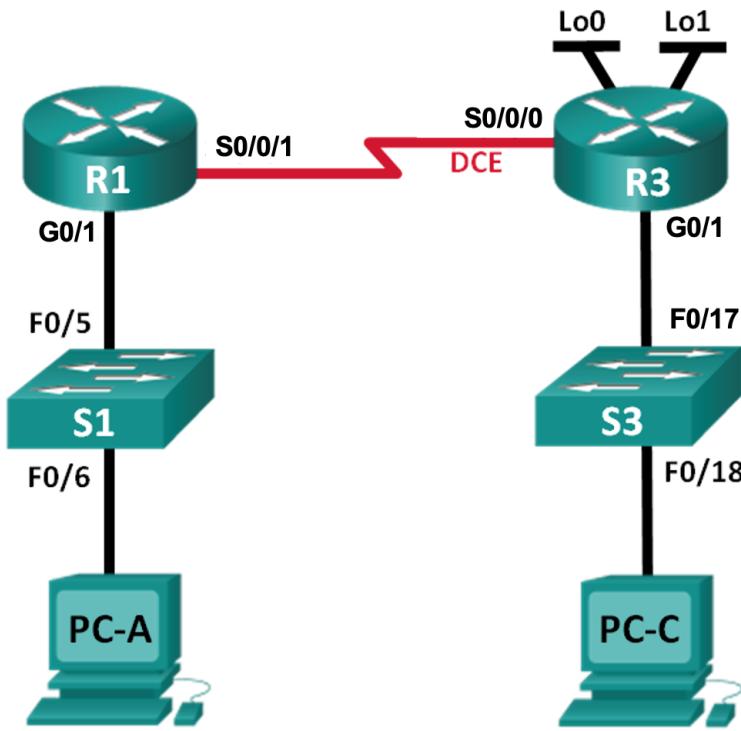
Assessment Items

(3/3) How to use Packet Tracer file

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 - Corresponding to the network topology and the addressing table
- 3. Complete device configuration according to the lab instruction
 - **Review:** “*Lab 1. Packet Tracer Tutorial & Build a Simple Network*”
- 4. Check the completion percentage and assessment items
- 5. Save and submit file

Topology and Devices

Topology



Addressing Table

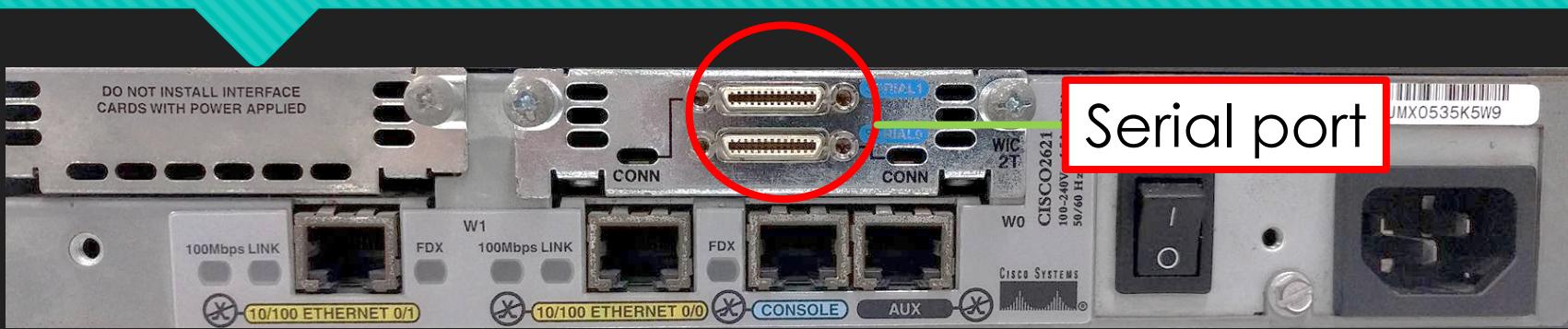
Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/1	192.168.0.1	255.255.255.0	N/A
	S0/0/1	a) _____	255.255.255.252	N/A
R3	G0/1	192.168.1.1	255.255.255.0	N/A
	S0/0/0 (DCE)	10.1.1.2	b) _____	N/A
	Lo0	209.165.200.225	255.255.255.224	N/A
	Lo1	198.133.219.1	255.255.255.0	N/A
PC-A	NIC	192.168.0.10	c) _____	d) _____
PC-C	NIC	192.168.1.10	e) _____	f) _____

- 2 Routers
- 2 Switches
- 2 PCs
- Console Cable
- Ethernet Cable
 - ? Straight Through
 - ? Crossover
- 1 Serial Cable

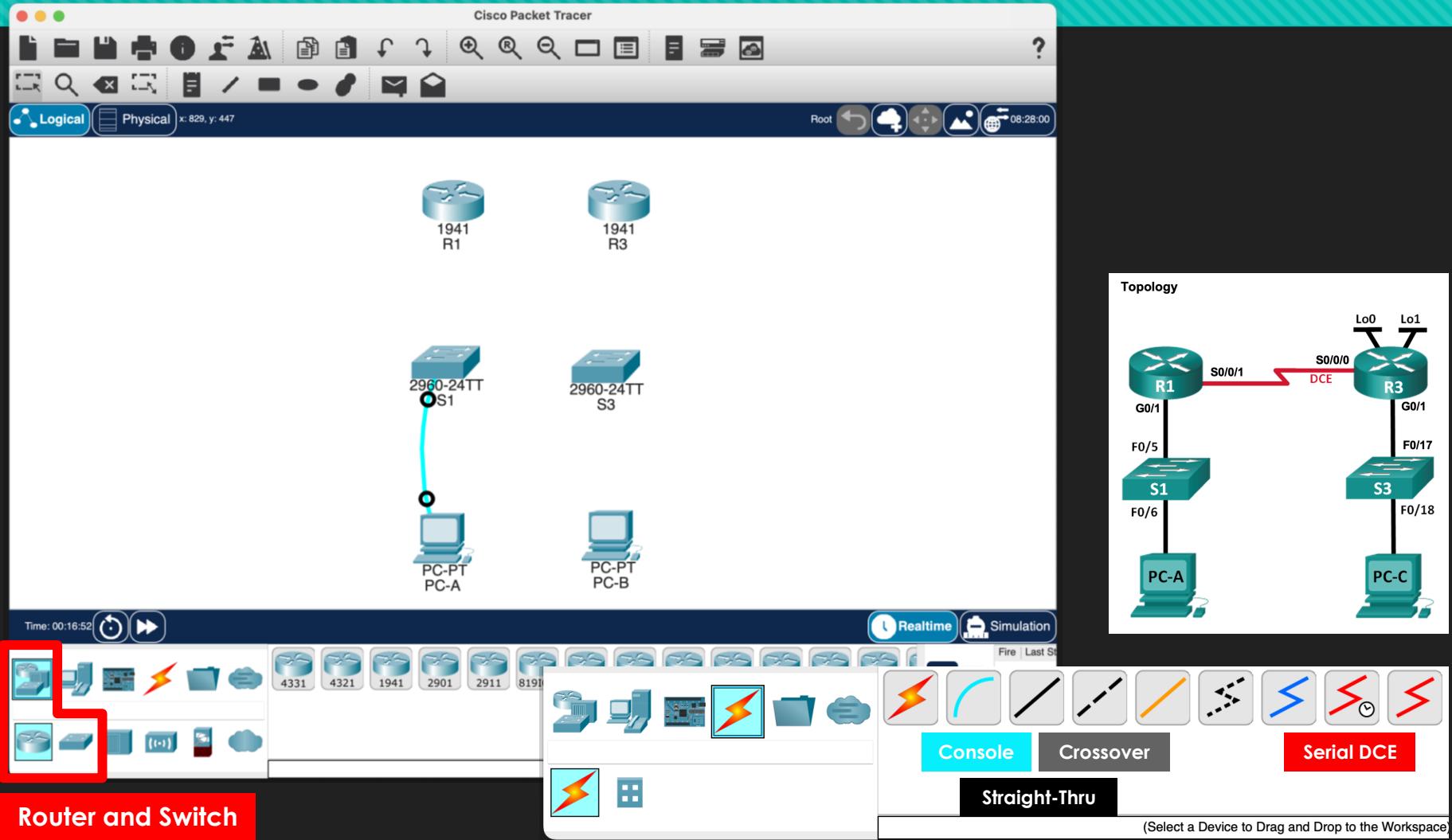
Set Up the Topology and Initialize Devices

1. Cable the network as shown in the topology
 - Serial Cable
2. Initialize and reload the router and switch

Serial Cable (Lab 6.2)

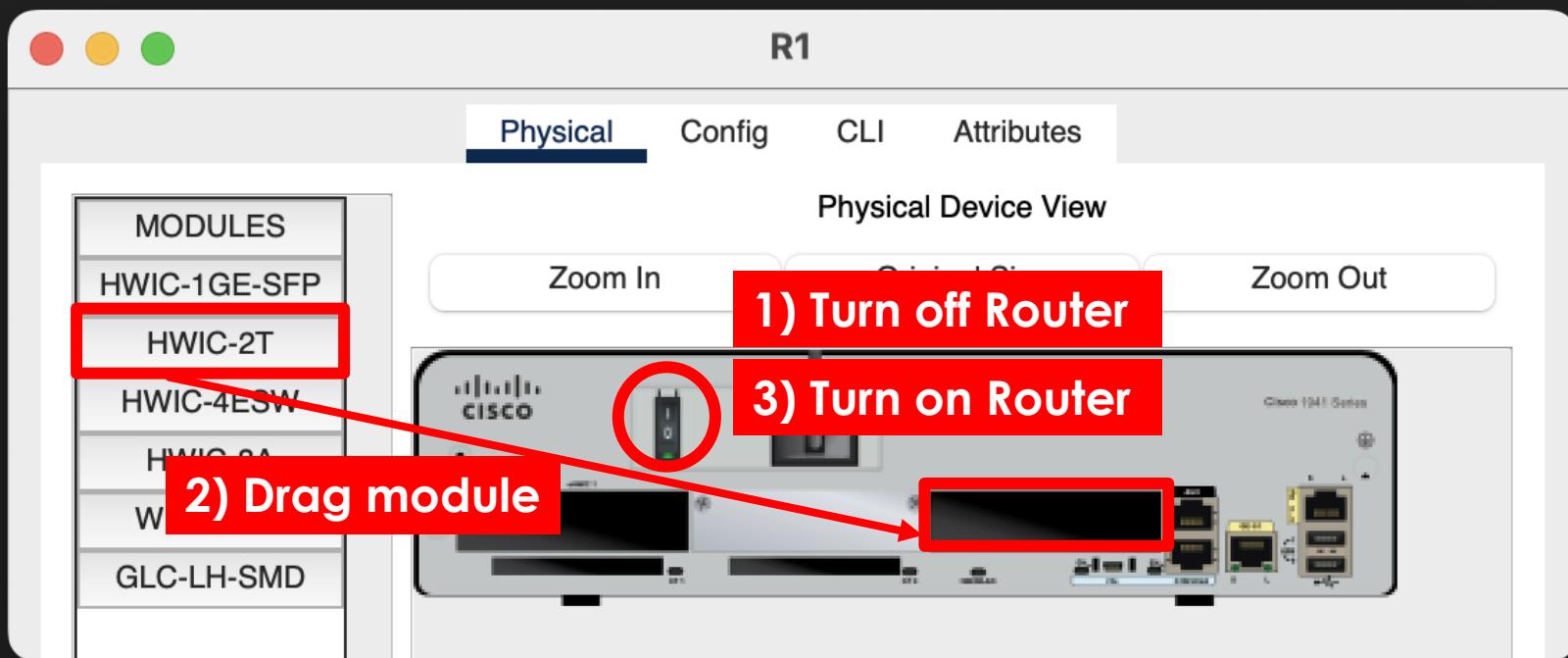


Packet Tracer file



Packet Tracer for this Lab

- Interface S0/0/0 and S0/0/1



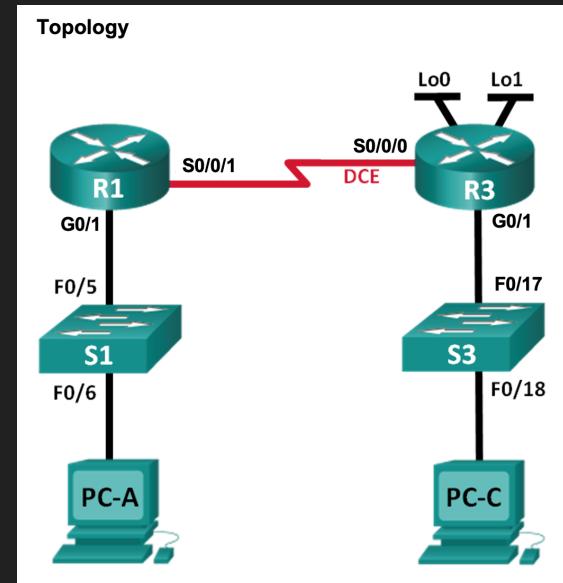
Configure serial cable

R3(config)# interface s0/0

```
R3(config-if)# ip address <ip address> <subnet mask>
```

```
R3(config-if)# clock rate 128000
```

R3(config-if)# no shutdown



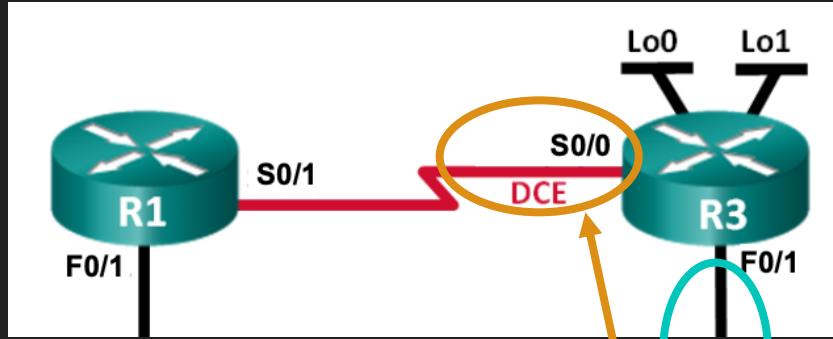
Configure Basic Device Settings and Verify Connectivity

1. Configure the PC interfaces
2. Configure basic settings on the routers
3. Configure IP settings on the routers
 - Configure serial cable
4. Verify connectivity of the LANs
5. Gather information (interface and routing table)

Configure Static Routes

- Recursive static routes
- Directly connected static route

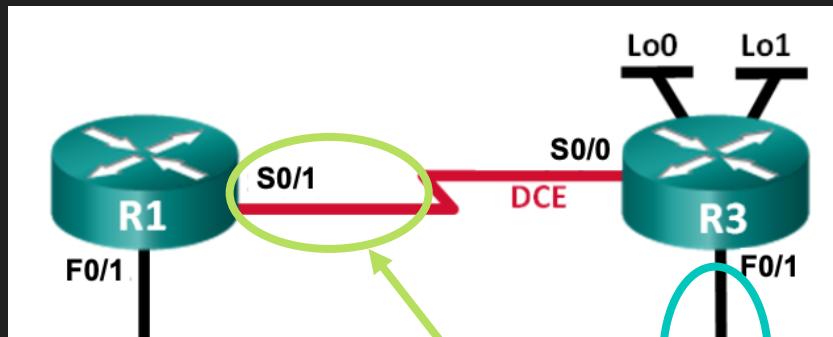
Recursive Static Route



R1(config-if)#

ip route <network ip> <subnet mask> <next-hop IP address>

Directly Connected Static Route



R1(config-if)#

ip route <network ip> <subnet mask> <exit interface>

Default Route

- Identify the gateway to which the router sends all IP packets for which it does not have a learned or static route
- Configure Default Route
 - ip route 0.0.0.0 0.0.0.0 <ip-address>
 - or
 - ip route 0.0.0.0 0.0.0.0 <exit-intf>

Lab 6.2 Configuring IPv4 Static and Default Routes

○ Video Clip

- Lab6.2.Configuring IPv4 Static and Default Routes

○ Materials

- **Slide** ([#3] Lab #3 Slide)
- **Lab sheet** ([#3] Lab 6.2 Configuring IPv4 Static and Default Routes)
- **Packet Tracer File** ([#3] Lab 6.2 [Packet Tracer] Configuring IPv4 Static and Default Routes)

○ Submission

- **Individual** Assignment ([#3] Lab 6.2: Answer Sheet)
 - **Answer** the question set on mCV
 - **Upload** your Packet Tracer File



Please practice using the Packet Tracer file by yourself, as the final test will require you to complete tasks on your own.

Lab 7 Configuring Basic Single-Area OSPFv2

[Provided Packet Tracer]

11:05 – 11:50 [45 mins]

Routing algorithm classification

Routing algorithm classification

Lab 6.2

How fast
do routes
change?

static: routes change
slowly over time

global: all routers have *complete*
topology, link cost info
• “link state” algorithms

Lab 7

dynamic: routes change
more quickly
• periodic updates or in
response to link cost
changes

decentralized: iterative process of
computation, exchange of info with neighbors
• routers initially only know link costs to
attached neighbors
• “distance vector” algorithms

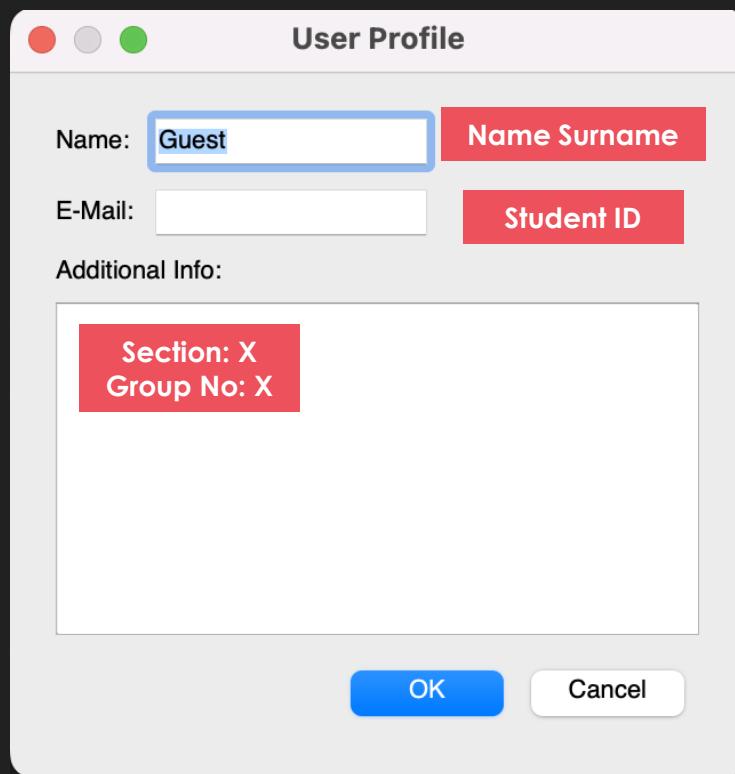
global or decentralized information?

Packet Tracer file

- Download Packet Tracer File from myCourseVille

(1/3) User Profile Setting

Press Ctrl(Cmd)+Shift+U to Open User Profile Dialog



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(2/3) Assessment

PT Activity: 00:00:1 Lab Instruction

Topology

PC-A is connected to Switch S1 via interface F0/6. Switch S1 is connected to Router R1 via interface F0/5.

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default
R1	G0/0	192.168.0.1	255.255.255.0	N/A
	G0/1	192.168.1.1	255.255.255.0	N/A

Completion: 4% | Back | 1/1 | Next | Check Results

Activity Results Time Elapsed: 00:02:39

You did not complete the activity. Please close this window and try again.

Component	Items/Total	Score
Ip	0/10	0/10
Other	0/10	0/10
Physical	2/23	2/23

Assessment Items

Assessment Items	Status	Points	Component(s)	Feedback
PC-A	Incorrect	1	Ip	
Ports	Incorrect	1	Ip	
FastEthernet0	Incorrect	1	Physical	Connects to FastEthernet0/6
IP Address	Incorrect	1	Physical	Type
Subnet Mask	Incorrect	1	Ip	
PC-B	Incorrect	1	Ip	
Ports	Incorrect	1	Ip	
FastEthernet0	Incorrect	1	Physical	Connects to GigabitEthernet0/0
IP Address	Incorrect	1	Physical	Type
Subnet Mask	Incorrect	1	Ip	
R1	Incorrect	1	Other	
Banner MOTD	Incorrect	1	Physical	
Console Line	Incorrect	1	Physical	Logging Synch
Login	Incorrect	1	Physical	Password
Terminal Line timed out	Incorrect	1	Physical	
DNS	Incorrect	0	Other	
IP Domain-Lookup	Incorrect	1	Other	Enable Secret
Host Name	Incorrect	1	Other	
Ports	Incorrect	1	Other	
GigabitEthernet0/0	Incorrect	1	Ip	Description
IP Address	Incorrect	1	Physical	Connects to FastEthernet0
Type	Incorrect	1	Physical	

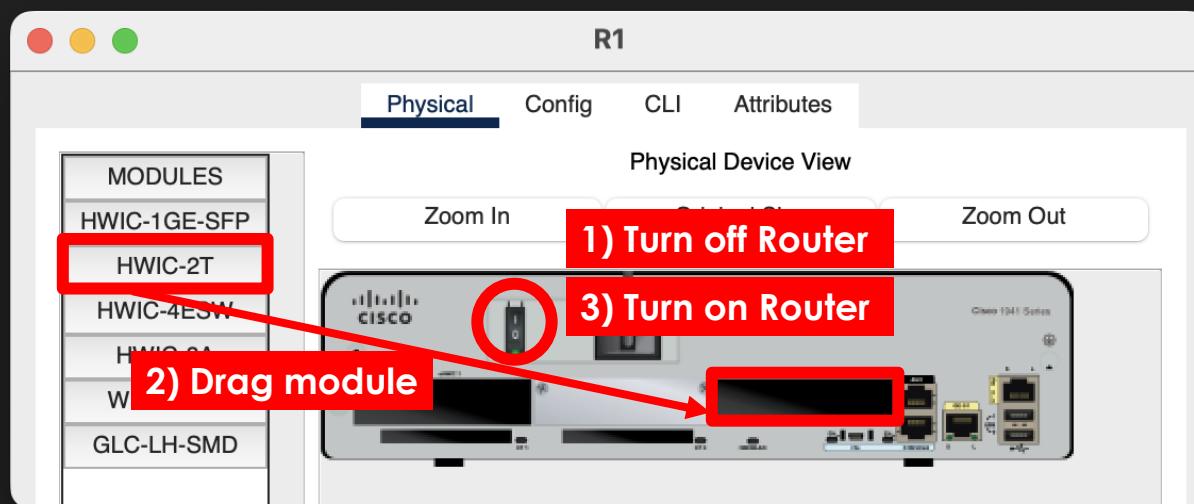
Close | Assessment Items

(3/3) How to use Packet Tracer file

- Devices used in each lab assignment (e.g. switch, router and PC) have been already provided
 - **DO NOT** add or remove any devices
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- 2. Select the appropriate cable type and connect it to each device
 - Corresponding to the network topology and the addressing table
- 3. Complete device configuration according to the lab instruction
 - **Review:** “*Lab 1. Packet Tracer Tutorial & Build a Simple Network*”
- 4. Check the completion percentage and assessment items
- 5. Save and submit file

Packet Tracer for this Lab

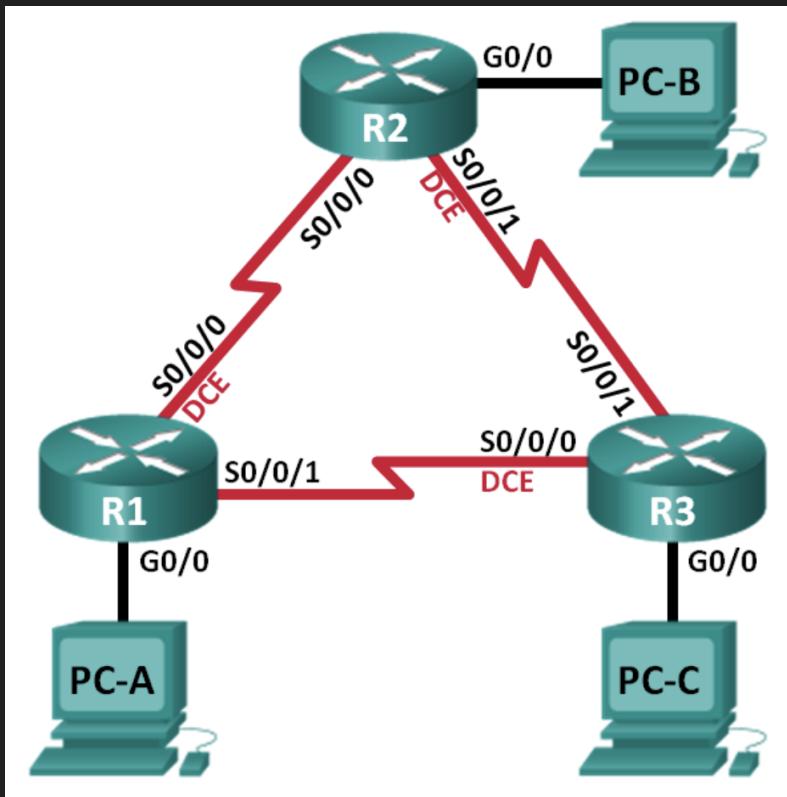
- Interface S0/0/0 and S0/0/1



Objectives

1. Build the Network and Configure Basic Device Settings
2. Configure and Verify OSPF Routing
3. Change Router ID Assignments
4. Configure OSPF Passive Interfaces
5. Change OSPF Metrics

Topology and Devices



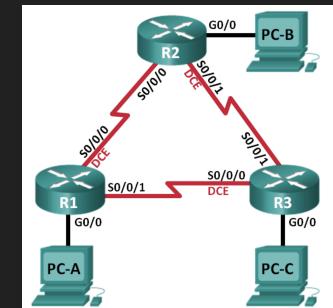
- 3 Routers
- 3 PCs
- Console cables
- Ethernet cables
 - ? straight through
 - ? crossover
- Serial cables

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	192.168.1.1	a) _____	N/A
	S0/0/0 (DCE)	192.168.12.1	b) _____	N/A
	S0/0/1	c) _____	255.255.255.252	N/A
R2	G0/0	192.168.2.1	255.255.255.0	N/A
	S0/0/0	d) _____	255.255.255.252	N/A
	S0/0/1 (DCE)	192.168.23.1	e) _____	N/A
R3	G0/0	192.168.3.1	f) _____	N/A
	S0/0/0 (DCE)	192.168.13.2	g) _____	N/A
	S0/0/1	h) _____	255.255.255.252	N/A
PC-A	NIC	192.168.1.3	255.255.255.0	i) _____
PC-B	NIC	192.168.2.3	j) _____	k) _____
PC-C	NIC	192.168.3.3	255.255.255.0	l) _____

1. Build the Network and Configure Basic Device Settings

- **Cable the network** as shown in the topology
- **Configure basic settings** for each router
 - Configure the IP address listed in the Addressing Table
(You must complete the blanks by yourself)
- **Configure PC hosts**
- **Test connectivity**
 - The routers should be able to ping one another
 - Each PC should be able to ping its default gateway
 - The PCs are unable to ping other PCs until OSPF routing is configured



Addressing Table					
Device	Interface	IP Address	Subnet Mask	Default Gateway	
R1	G0/0	192.168.1.1	a) _____	N/A	
	S0/0/0 (DCE)	192.168.12.1	b) _____	N/A	
	S0/0/1	c) _____	255.255.255.252	N/A	
R2	G0/0	192.168.2.1	255.255.255.0	N/A	
	S0/0/0	d) _____	255.255.255.252	N/A	
	S0/0/1 (DCE)	192.168.23.1	e) _____	N/A	
R3	G0/0	192.168.3.1	f) _____	N/A	
	S0/0/0 (DCE)	192.168.13.2	g) _____	N/A	
	S0/0/1	h) _____	255.255.255.252	N/A	
PC-A	NIC	192.168.1.3	255.255.255.0	i) _____	
PC-B	NIC	192.168.2.3	j) _____	k) _____	
PC-C	NIC	192.168.3.3	255.255.255.0	l) _____	

2. Configure and Verify OSPF Routing

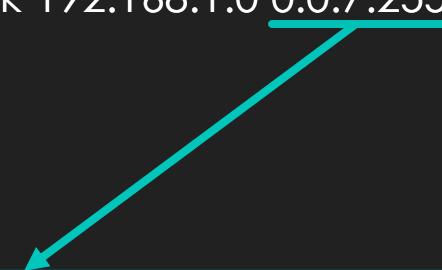
- You will configure OSPFv2 routing on all routers
- **Important** configuration commands
 - R1(config)# router ospf **[process-id]**
 - R1(config-router)# network **[network-addr]** **[wildcard-mask]** area **[area-id]**

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 - i.e. R1(config-router)# network 192.168.1.0 0.0.7.255 area 0

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 - i.e. R1(config-router)# network 192.168.1.0 0.0.7.255 area 0



Note: Wildcard mark is bitwise NOT on subnet mask

Subnet mask: **11111111.11111111.1111000.00000000 = 255.255.248.0**

Wildcard mark: **00000000.00000000.0000111.11111111 = 0.0.7.255**

3. Change Router ID Assignments

- The OSPF **router ID** is used to **uniquely identify the router** in the OSPF routing domain
- Cisco routers derive the router ID in one of **three ways** and with the following **priority**
 1. IP address configured with the OSPF **router-id** command
 2. **Highest IP address** of any of the router's **loopback addresses**
 3. **Highest active IP address** on any of the router's **physical interfaces**
- **Important** configuration commands
 - R1(config-router) # **router-id [router-address]**

4. Configure OSPF Passive Interfaces

- The passive-interface command **prevents routing updates** from being sent through the specified router interface
- This is commonly done **to reduce traffic on the LANs** as they do not need to receive dynamic routing protocol communication
- **Important** configuration commands
 - R1(config-router)# passive-interface **[interface]**

5. Change OSPF Metrics

- The **default reference-bandwidth** for OSPF is **100Mb/s** (Fast Ethernet speed) but most modern infrastructure devices have links that are faster than 100Mb/s
 - This results in Fast Ethernet, Gigabit Ethernet, and 10G Ethernet interfaces **all having the same cost**
- **Important** configuration commands
 - R1(config-router)# auto-cost reference-bandwidth **[bandwidth]**

Verification commands

Important verification commands

OR1# show ip ospf neighbor

- To verify that each router lists the other routers in the network as neighbors

OR1# show ip route

- To verify that all networks display in the routing table on all routers

OR1# show ip protocols

- A quick way to verify OSPF configuration information

OR1# show ip ospf

- To examine the OSPF process ID and router ID

OR1# show ip ospf interface

- To show more detailed list of every OSPF-enabled interface

Lab 7 Configuring Basic Single- Area OSPFv2

○ Video Clip

- Lab7.Configuring Basic Single-Area OSPFv2

○ Materials

- Slide ([#3] Lab #3 Slide)
- Lab sheet ([#3] Lab 7 Configuring Basic Single Area OSPFv2)
- Packet Tracer File ([#3] Lab 7 [Packet Tracer] Configuring Basic Single Area OSPFv2)

○ Submission

- **Individual** Assignment ([#3] Lab 7: Answer Sheet)
 - **Answer** the question set on mCV
 - **Upload** your Packet Tracer File



Please practice using the Packet Tracer file by yourself, as the final test will require you to complete tasks on your own.

Appendix

Physical Equipment

Switch

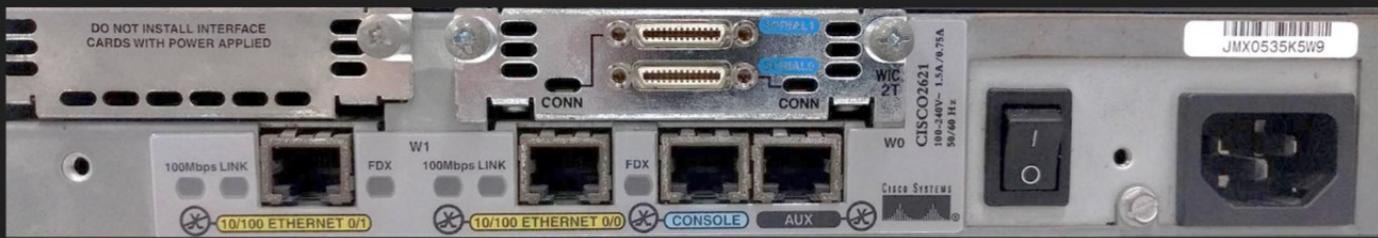
Front



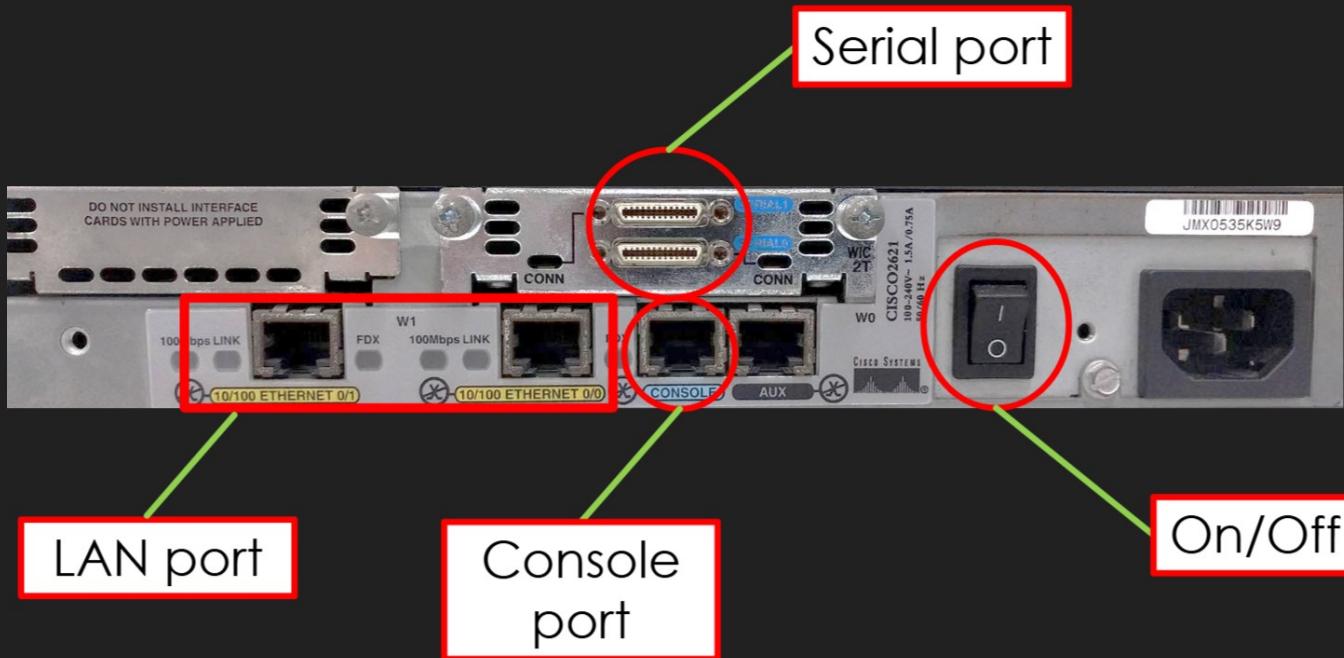
Back



Router



Router

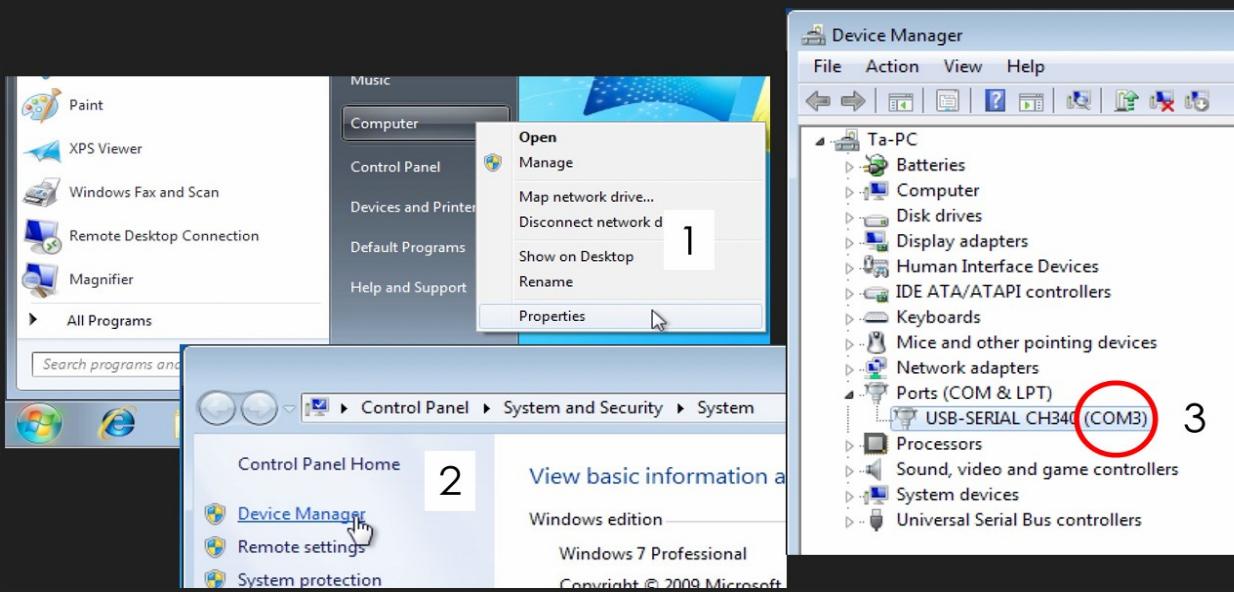


Console Cable

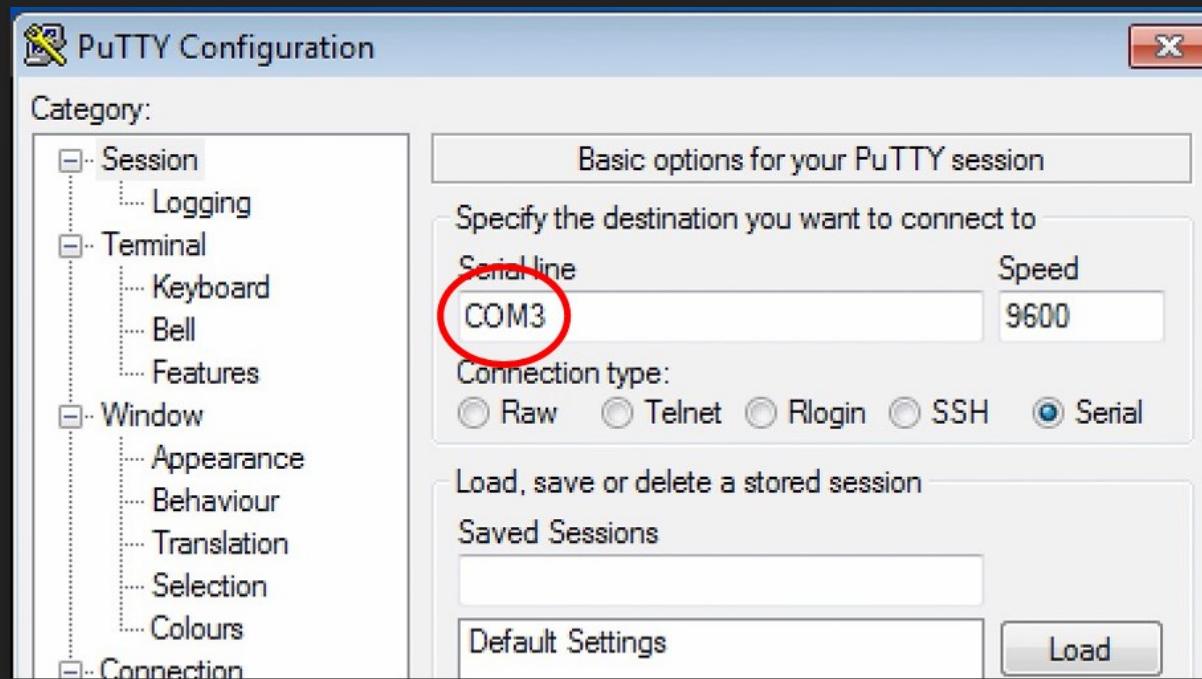


Console Cable

○ Find out the port name



Putty



For Linux/macOS

Ocheck port in linux

```
ls /dev/tty* | grep serial
```

Oconnect with screen

```
screen /dev/<serial name> 9600 -L
```

Oterminate screen session

```
screen -XS <session-id> quit
```

Configure the PC interfaces

The image displays four Windows configuration windows and one Mac OS X window side-by-side.

- Control Panel Network and Internet:** Shows the main Network and Internet section with links to Network and Sharing Center, HomeGroup, Internet Options, and Infrared.
- Network and Sharing Center:** Shows Change adapter settings, with the Ethernet adapter selected. A red box highlights the "Properties" button.
- Network Connections:** Shows the list of network adapters. The Ethernet adapter is selected, and a red box highlights the "Properties" button.
- Ethernet Properties:** Shows the Networking tab. Under "Connect using:", "Qualcomm Atheros AR8151 PCI-E Gigabit Ethernet Controller" is selected. Under "This connection uses the following items:", "Internet Protocol Version 4 (TCP/IPv4)" is selected. A red box highlights the "Properties" button.
- Internet Protocol Version 4 (TCP/IPv4) Properties:** Shows the General tab. It includes fields for IP address (192.168.0.10), Subnet mask (255.255.255.0), and Default gateway (192.168.0.254). Radio buttons for "Obtain an IP address automatically" and "Use the following IP address" are shown, with the second option selected. A red box highlights the "OK" button.
- Mac OS X Network Preferences:** Shows the Wi-Fi tab. The status is "Connected" to "Tony Stark" with IP address 192.168.7.45. A red box highlights this status message. Below it, checkboxes for "Automatically join this network" and "Ask to join Personal Hotspots" are checked. The "Wi-Fi" tab has tabs for Wi-Fi, TCP/IP, DNS, WINS, 802.1X, Proxies, and Hardware. The TCP/IP tab is active, showing IPv4 and IPv6 configuration details.