



شبكات الحواسيب  
Computer Networks

جامعة  
المنارة

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# LAB3 (Theoretical)

- Local Area Network (LAN)
  - Connecting different LANs together
    - Using Router
      - Router
        - Possible interface and cable networking
          - Ethernet
          - Serial
          - RS232
        - Configuration via console
          - DHCP Server
          - Static routing
          - Dynamic routing



# LAB3 (Theoretical)

- Local Area Network (LAN)
  - Connecting different LANs together
    - Using Router
      - Router
        - Basic console commands:
          - enable // enter privileged EXEC mode
          - disable // exit privileged EXEC mode and return to user EXEC mode
          - show // show important status information
            - show running-config // Displays the running configuration file
            - show run interface interfacename
            - show terminal // Display terminal configuration parameters
            - show users // Display information about terminal lines
            - show hosts //IP domain-name, lookup style, nameservers, and host table
          - end // end the current configuration session and return to privileged EXEC mode
          - exit //Exits from the current configuration mode to the next highest configuration mode
          - mode
          - ? // used after any command for displaying its help

# LAB3 (Theoretical)

- Local Area Network (LAN)
  - Connecting different LANs together
    - Using Router
      - Router
        - Configuring Global Parameters

	Command	Purpose
Step 1	<b>configure terminal</b>  <b>Example:</b> Router> enable Router# configure terminal Router(config)#	Enters global configuration mode, when using the console port.  Use the following to connect to the router with a remote terminal: telnet <i>router name or address</i> Login: <i>login id</i> Password: <i>*****</i> Router> enable
Step 2	<b>hostname <i>name</i></b>  <b>Example:</b> Router(config)# hostname Router Router(config)#	Specifies the name for the router.

# LAB3 (Theoretical)

- Local Area Network (LAN)
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	Command	Purpose
Step 3	<b>enable secret <i>password</i></b>  <b>Example:</b> <pre>Router(config)# enable secret c1my5h0 Router(config)#</pre>	Specifies an encrypted password to prevent unauthorized access to the router.
Step 4	<b>no ip domain-lookup</b>  <b>Example:</b> <pre>Router(config)# no ip domain-lookup Router(config)#</pre>	Disables the router from translating unfamiliar words (typos) into IP addresses.

# LAB3 (Theoretical)

- Local Area Network (LAN)
  - Connecting different LANs together
    - Using Router
      - Router
        - Configuring WAN Interface Ports

	Command	Purpose
Step 1	<b>interface</b> <i>type number</i>  <b>Example:</b> Router(config)# <b>interface fastethernet</b> 0 Router(config-int)#	Enters the configuration mode for a Fast Ethernet WAN interface on the router.  <b>Note</b> Fast Ethernet WAN ports are numbered 0–1 on the Cisco 1800 series routers.
Step 2	<b>ip address</b> <i>ip-address mask</i>  <b>Example:</b> Router(config-int)# <b>ip address</b> 192.1.12.2 255.255.255.0 Router(config-int)#	Sets the IP address and subnet mask for the specified Fast Ethernet interface.

# LAB3 (Theoretical)

- Local Area Network (LAN)
  - Connecting different LANs together
    - Using Router
      - Router
        - Configuring WAN Interface Ports

	Command	Purpose
Step 3	<b>no shutdown</b>  <b>Example:</b> Router(config-int)# <b>no shutdown</b> Router(config-int)#	Enables the Ethernet interface, changing its state from administratively down to administratively up.
Step 4	<b>exit</b>  <b>Example:</b> Router(config-int)# <b>exit</b> Router(config)#	Exits interface configuration mode and returns to global configuration mode.

# LAB3 (Theoretical)

- Local Area Network (LAN)
  - Connecting different LANs together
    - Using Router
      - Router
        - Configuring Static Routes
          - Executing the commands enable, configure terminal

	Command	Purpose
Step 1	<p><b>ip route</b> <i>prefix mask {ip-address   interface-type interface-number [ip-address]}</i></p> <p><b>Example:</b> Router(config)# <b>ip route</b> 192.168.1.0 255.255.0.0 10.10.10.2 Router(config)#</p>	<p>Specifies the static route for the IP packets.</p> <p>For details about this command and additional parameters that can be set, see the <a href="#">Cisco IOS IP Command Reference, Volume 2 of 4: Routing Protocols</a>.</p>
Step 2	<p><b>end</b></p> <p><b>Example:</b> • . Router(config)# <b>end</b> Router#</p>	<p>Exits router configuration mode, and enters privileged EXEC mode.</p>



# LAB3 (Theoretical)

- Local Area Network (LAN)
  - Connecting different LANs together
    - Using Router
      - Router
        - Configuring Dynamic Routes

	Command	Task
Step 1	<b>router rip</b>  Example: Router> <b>configure terminal</b> Router(config)# <b>router rip</b> Router(config-router)#	Enters router configuration mode, and enables RIP on the router.
Step 2	<b>version {1   2}</b>  Example: Router(config-router)# <b>version 2</b> Router(config-router)#	Specifies use of RIP version 1 or 2.
Step 3	<b>network ip-address</b>  Example: • . Router(config-router)# <b>network 192.168.1.1</b> Router(config-router)# <b>network 10.10.7.1</b> Router(config-router)#	Specifies a list of networks on which RIP is to be applied, using the address of the network of directly connected networks.

# LAB3 (Theoretical)

- Local Area Network (LAN)
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	Command	Task
Step 4	<b>no auto-summary</b>  <b>Example:</b> Router(config-router)# <b>no auto-summary</b> Router(config-router)#	Disables automatic summarization of subnet routes into network-level routes. This allows subprefix routing information to pass across classful network boundaries.
Step 5	<b>end</b>  <b>Example:</b> Router(config-router)# <b>end</b> Router#	Exits router configuration mode, and enters privileged EXEC mode.

# LAB3 (Practical)

- Training: Task is to connect different LANs by using IP Router (both static and dynamic)
  - LAN1:
    - Consists of 3 hosts connecting via wired cables with a router
    - IP range 192.168.10.100 ~ 200
  - LAN2:
    - Consists of 3 hosts connecting via wired cables with a router
    - IP range 192.168.20.100 ~ 200
  - Both LANs connecting with each other via a new router
  - Discuss your solution by giving the reason
    - Define the suitable subnet mask
    - Is it necessary to configure the Gateway and DNS server?
    - Achieving the connection between the previous LANs for which the hosts in the LANs can as possible see each others
  - Testing the NW by using ping and tracert command

# LAB3 (Practical)

- Homework: Task is to connect different LANs by using IP Router
  - Available Hardware:
    - IP Routers
    - 5 companies which want to connect to the Internet
      - Each one consists of 2 hosts at least
    - Web Server as Internet Service Provider ([www.myweb.com](http://www.myweb.com))
    - E-Mail Server as Internet Service Provider (pop3.sy, smtp.sy)
  - Give a solution for building such NW
  - Discuss your solution by giving the reason
    - Define the required IP ranges for each LAN
    - Define the suitable subnet mask
    - Is it necessary to configure the Gateway and DNS server?
    - Configure the IP Routers for achieving the connection between the LANS as well as the Internet
  - Testing the NW by using ping and tracert command, Browser and Email Client