

WIRELESS NETWORK MANAGEMENT USING CISCO PACKET TRACER

BY

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CHAPTER-1

ABSTRACT

Wired and wireless native house networks unit wide utilized in university, library, coffee bar, building and enterprise networks to support network policies. The concepts of wired and wireless, blessings and disadvantages, main ideas, operations, applications and configurations unit expressed. In wired native house network, DHCP, HTTP and HTTPS are going to be enforced on very little native networks in addition as large enterprise networks. space unit a network{LAN} and Wi-Fi area unit the two main categories to change computer network connections. computer network is connecting multiple devices like computers, switches and routers provides a easy interface. Wi-Fi technologies can attach with cyber web via degree access purpose include desktops and laptops, smartphones and tablets. IEEE 802.3 is that the standards for computer network and IEEE 802.11 is the standards for Wi-Fi. Keyword: - DHCP, HTTP, HTTPS, Ethernet, Wi-Fi, IEEE 802.3 and IEEE 802.11

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INTRODUCTION

Computer networks unit sometimes divided into a attempt of categories, native house networks (LANs) and wide house networks (WANs). native house networks (LANs) unit a bunch of computes and associated devices that share a typical communication line or wireless link to a server. Cables, routers, switches and each one altogether entirely totally different elements attach with internal servers and each one altogether entirely totally different native house network (LANs) via wide house networks (WANs). DHCP (Dynamic Host Configuration Protocol) accustomed dynamically assign an online Protocol address to any device on a network can communicate victimization branch of data. HTTPS (Hypertext Transfer Protocol Secure) is associate extension of HTTP (Hypertext Transfer Protocol) used for secure communication over a network and encrypted TLS (Transport Layer Security) or SSL (Secure Sockets Layer). Cisco Packet Tracer unit of measurement usually a multi-tasking network simulation package package that's in academic degree passing position to be accustomed perform and analyze varied network activities like implementation of varied topologies allowed users to simulate the complete network byadding and connecting distinction network devices. The configuration of cisco router used command interface.

2.4 Cisco Packet Tracer Overview

Cisco Packet Tracer could also be a Cisco proprietary multi-platform tool that allows likelihood for students to create networking and IoT simulations whereas not wish of a hardware or pre-existent network. The tool is free of charge, runs on the foremost operative systems and it's downloadable from Cisco NetAcad page for all students and lecturers having a legitimate NetAcad account. The tool has been offered through the years for all the students participating in Cisco courses and, originally, was designed to support smart exercises for faculty students attending the Certified Cisco Network Associated

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3.IPADDRESS AND SUBNETTING

An informatics address may be a numeric symbol appointed to every machine on AN informatics network. It designates the specific location of a tool on the network. informatics addressing was designed to permit hosts on one network to communicate with hosts on completely different networks in spite of the sort of area unit a network|LAN|computer network} the hosts

3.2 Subnetting

Subnetting is that the method of stealing bits from the host a part of Associate in Nursing information processing address so as to divide the larger network into smaller sub-networks referred to as subnets [8]. once subnetting, network subnet host fields square measure created. An information processing address is often reserved to spot the subnet and another one to spot the printed address among the subnet. Subnetting will be exhausted 3 basic ways that, one amongst that is subnetting supported the amount of subnetworks you would like to get from one block of information processing address; in our own way is to subnet supported the amount of host computers or devices you would like to be connected to it sub-network and eventually subnetting by reverse engineering that could be a state of affairs during which a subnet mask Associate in Nursing an information processing address block is given and therefore the range of sub networks and range of hosts per every subnet square measure found [8]. as an example, if a public IP address block of 192.168.23.1 with a subnet mask of 255.255.255.252 is purchased from our ISP and since this block has solely two valid hosts, this IP address is employed to assign to our Router interface so traffic is directed from our network to the ISP and from there to the net. a personal IP address block is then chosen to hold out IP addressing among our network. as a result of the expected

purchasers on this network, a category B address is chosen for the internal network and it's 172.168.0.0 with a mask of 255.255.0.0. supported the facility of 2s, there square measure some equations

No of submasks = 2^x

No of host per subnet mask = $2^y - 2$

Block size = increment = 256-subnet mask

3.3 Subnet Mask

For the subnet theme to work, every host (machine) on the network ought to grasp that a neighborhood of the host address square measure used as a result of the subnet address. typically|this can be} often accomplished by assignment subnet mask to each machine. A subnet mask may well be a 32-bit worth that allows the recipient of Associate in Nursing scientific discipline packet to differentiate the network ID portion of the scientific discipline address from the host ID portion of the scientific discipline address.

Class Of IP	Format	Default Subnet Mask
A	Network: node: node: node	255.0.0.0
B	Network: network: node: node	255.255.0.0
C	Network: network: network: node	255.255.255.0

4. Wireless local area networks

A wireless network uses for devices to be **shared** while not networking cables. **the 2** main forms of **wireless** networking area unit peer to peer or ad-hoc and **infrastructure** ..

4.1 Peer to peer or ad-hoc

A peer to peer or an ad-hoc wireless network consists of a number of computers each equipped with a wireless networking interface card. Each computer can communicated directly with all of the other wireless enable computers.

4.2 Infrastructure

An infrastructure wireless network consists of a base station or associate access purpose. associate access purpose acts sort of a hub.

Hub connect or bridge the wireless local area network to a wired local area network.

4.3 WIRELESS ACCESS POINT

Wireless access points (WAPs) area unit hardware devices on space | a neighborhood } area network (LAN). WAPs area unit organized that allows wireless capable devices and wired networks to attach through a wireless normal. A wireless access purpose adds WI-Fi

capability to a wired network onto associate LAN local area network by bridging traffic from workstations.

4.4. WIRELESS ROUTER

A wireless router combines broadband capabilities furthermore as wireless access purpose selections inside one device. A wireless router connects a gaggle of wireless stations to degree adjacent wired native house network. A wireless router is to boot a wireless access purpose combined with degree native house network router. A wireless router forwards scientific discipline packets between wireless subnet and other subnet.

5. DESIGN AND CONFIGURATION OF WIRELESS LAN

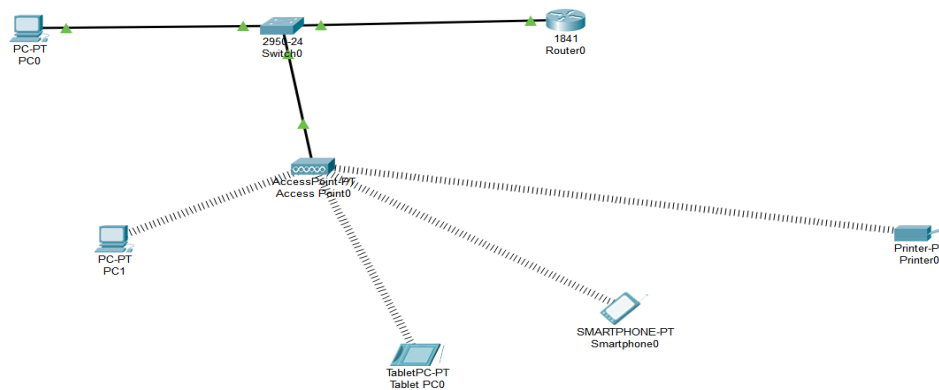
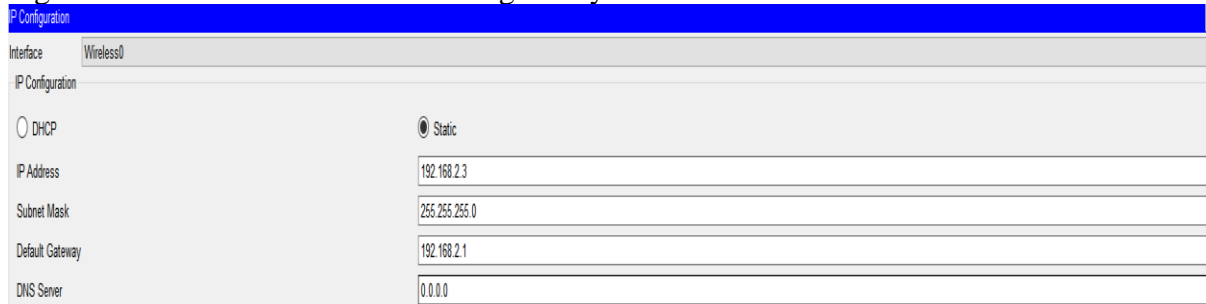


Fig-7: A Wired and wireless local area network created using cisco packet tracer

TABLE 1: ADDRESSING TABLE

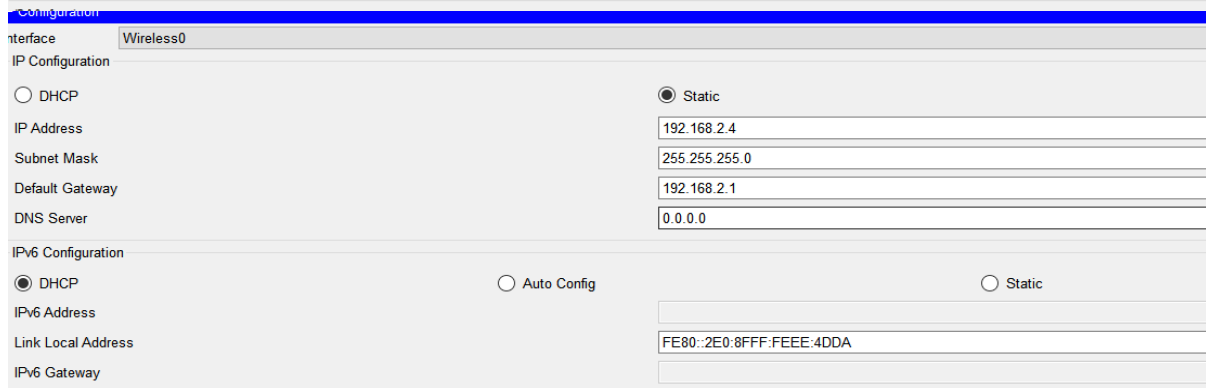
DEVICE	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
PC0	192.168.2.2	255.255.255.0	192.168.2.1
PC1	192.168.2.3	255.255.255.0	192.168.2.1
ROUTER0	192.168.2.1	255.255.255.0	
SMART PHONE	192.168.2.4	255.255.255.0	192.168.2.1
TABLET	192.168.2.5	255.255.255.0	192.168.2.1
PRINTER	192.168.2.6	255.255.255.0	

Fig-8: IP address of PC1 from default gateway



The screenshot shows the 'IP Configuration' window for interface 'Wireless0'. The 'Static' radio button is selected. The IP Address is 192.168.2.3, Subnet Mask is 255.255.255.0, Default Gateway is 192.168.2.1, and DNS Server is 0.0.0.0.

Field	Value
Interface	Wireless0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IP Address	192.168.2.3
Subnet Mask	255.255.255.0
Default Gateway	192.168.2.1
DNS Server	0.0.0.0



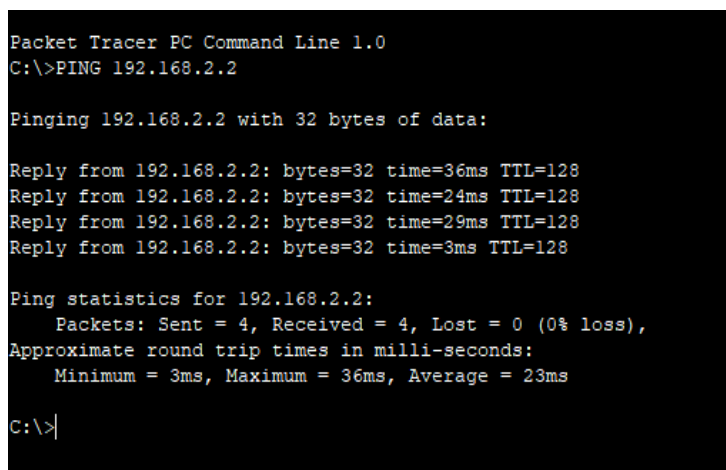
The screenshot shows the 'IP Configuration' window for interface 'Wireless0'. The 'Static' radio button is selected. The IP Address is 192.168.2.4, Subnet Mask is 255.255.255.0, Default Gateway is 192.168.2.1, and DNS Server is 0.0.0.0. Below this, the 'IPv6 Configuration' section shows 'DHCP' selected, 'Auto Config' selected, and 'Static' unselected. The IPv6 Address is empty, Link Local Address is FE80::2E0:8FFF:EEEE:4DDA, and IPv6 Gateway is empty.

Field	Value	
Interface	Wireless0	
IP Configuration		
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static	
IP Address	192.168.2.4	
Subnet Mask	255.255.255.0	
Default Gateway	192.168.2.1	
DNS Server	0.0.0.0	
IPv6 Configuration		
<input checked="" type="radio"/> DHCP	<input type="radio"/> Auto Config	<input type="radio"/> Static
IPv6 Address		
Link Local Address	FE80::2E0:8FFF:EEEE:4DDA	
IPv6 Gateway		

Fig-9: IP address of PC2 from DEFAULT GATEWAY

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6.Test connectivity



The screenshot shows the 'Packet Tracer PC Command Line 1.0' window. The command 'C:\>PING 192.168.2.2' has been entered. The output shows four successful replies from 192.168.2.2 with varying times and TTL values. The statistics show 4 packets sent, 4 received, and 0% loss.

```
Packet Tracer PC Command Line 1.0
C:\>PING 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=36ms TTL=128
Reply from 192.168.2.2: bytes=32 time=24ms TTL=128
Reply from 192.168.2.2: bytes=32 time=29ms TTL=128
Reply from 192.168.2.2: bytes=32 time=3ms TTL=128

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 36ms, Average = 23ms

C:\>|
```

Fig-21: Ping test from PC1 to PC0


```

C:\>PING 192.168.2.4

Pinging 192.168.2.4 with 32 bytes of data:

Reply from 192.168.2.4: bytes=32 time=44ms TTL=128
Reply from 192.168.2.4: bytes=32 time=40ms TTL=128
Reply from 192.168.2.4: bytes=32 time=25ms TTL=128
Reply from 192.168.2.4: bytes=32 time=18ms TTL=128

Ping statistics for 192.168.2.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 18ms, Maximum = 44ms, Average = 31ms

```

Fig-21: Ping test from PC1 to LAPTOP

```

C:\>PING 192.168.2.5

Pinging 192.168.2.5 with 32 bytes of data:

Reply from 192.168.2.5: bytes=32 time=44ms TTL=128
Reply from 192.168.2.5: bytes=32 time=10ms TTL=128
Reply from 192.168.2.5: bytes=32 time=19ms TTL=128
Reply from 192.168.2.5: bytes=32 time=13ms TTL=128

Ping statistics for 192.168.2.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 44ms, Average = 21ms

```

Fig-21: Ping test from PC1 to TABLET

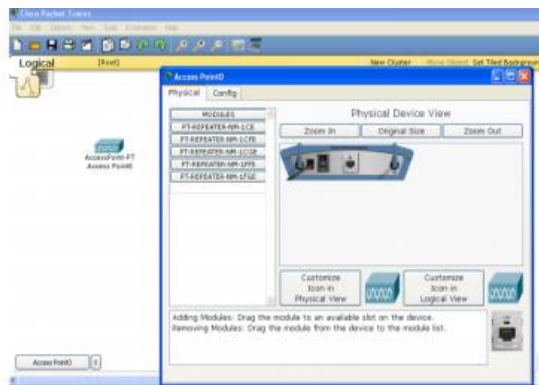


Fig 1: wireless Access point in packet tracer.

Wireless access purpose sometimes includes functions like network address translation (NAT) and dynamic host configuration protocol (DHCP). you can compare Associate in Nursing AP TO Hub as a result of it doesn't produce collision domains for every port sort of a switch will, however APs square measure positively smarter than hubs.

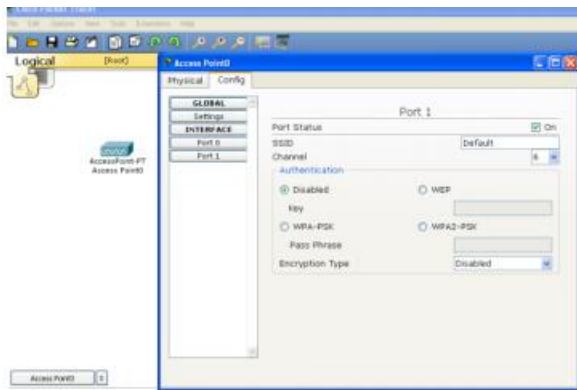


Fig 2: wireless Access Point settings in packet tracer.

In on top of Fig.2 given configuration of AP in this port status is on. SSID that in our case it's default conjointly we are able to set any numerical price for straightforward security purpose and conjointly given totally different security protocols like WEP and WPA



Fig 3: Linksys Wireless Router in packet tracer

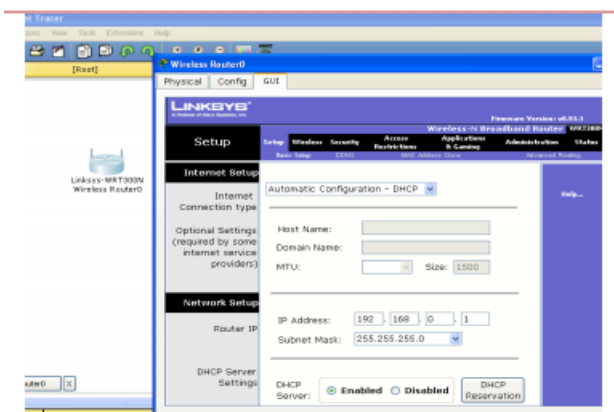


Fig 4: Wireless Router with GUI based configuration in packet tracer

As given in Fig 3 and Fig four wireless router quite an inspired physical router same configuration i given in packet tracer so by wise, students will merely savvy to assemble original physical router.

Wireless Network Interface Card (NIC)

Every host you wish to attach to a wireless network needs a wireless network interface card (NIC) to try and do thus. Basically, a wireless NIC will an equivalent job as a standard NIC, solely rather than having a socket/port to plug a cable into; the wireless NIC contains a nondirectional antenna.



Fig 5: Wireless NIC is attached witch PC in packet tracer.

I As given in Fig four facility provided in packet tracer by which we will take away local area network instrumentation (wired NIC) and by drag and drop we will add wireless NIC card to PCs and Laptops.

7. ADVANTAGES AND DISADVANTAGES OF WIRELESS LAN

Advantages :

Access Points offer the liberty to scale the quantity of devices supported on network. Business-grade access points can be put in anyplace and might run associate degree coax cable. Power over local area network (PoE) isn't any ought to run a separate power line. extra commonplace options embody Access management List (ACL) support to limit guest access while not network security.

Disadvantages

The typical vary of a typical 802.11g network is on the order of tens of meters. to get extra vary, repeaters or extra access points are going to be purchased. thus prices will add for these devices.

8. CONCLUSION

The utilization of wired and wireless native space networks provided modify network management and improved network security. Wireless Technology provides several edges like flexibility, movableness and lower prices. Wi- Fi networks will be accessed with mobile smartphones, tablets and portable computer

9. ACKNOWLEDGEMENT

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10. REFERENCES

[1] CCNA Routing and switch Courses, University of laptop computer Studies, 2013. [2] F.KUROSE KEITH W.ROSS COMPUTER NETWORKING A top-down Approach 6th Edition. [3] Muhammad Had, Big information Analytics for Wireless and Wired Network Design A Survey", School of Electronic and technology [4] Rahul Malhotr Simulation & Performance Analysis of Wired and Wireless laptop computer Networks Associate Professor AdeshInstitute of Engineering & Technology [5] William Stallings Data and laptop computer Communication Eighth Edition.
