

Exp 6: Implementation of Smart home using Cisco packet tracer and verify the configuration

Network Components Overview:

- Server-PT (Server1)
- Laptop-PT (Laptop0)
- 2960-24TT Switch0
- WRT300N Wireless Router0
- IoT Devices: Fan (IoT0), Door (IoT1), Garage Door (IoT4), Light (IoT2), Window (IoT3)

Step-by-Step Setup:

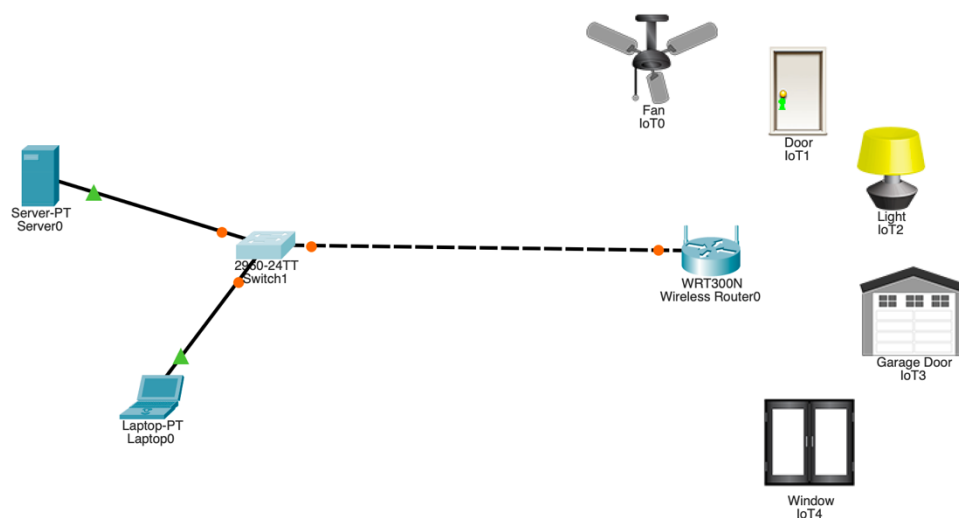
1. Add the Components:

- Open Cisco Packet Tracer and add the following components from the End Devices and Network Devices:

- Server-PT (Server1) from End Devices
- Laptop-PT (Laptop0) from End Devices
- 2960-24TT Switch from Network Devices > Switches
- WRT300N Wireless Router from Network Devices > Wireless Devices
- IoT Devices (found under End Devices > IoT Devices):
 - Fan (IoT0)
 - Door (IoT1)
 - Garage Door (IoT4)
 - Light (IoT2)
 - Window (IoT3)

2. Establish Wired Connections:

- Use Copper Straight-through Cable to connect the following devices:
 - Server1 to Switch0
 - Laptop0 to Switch0
 - WRT300N Wireless Router to Switch0



3. Configure the Wireless Router (WRT300N):

- Click on WRT300N Wireless Router, go to the Config tab:
- Set the SSID to home.
- Go to Wireless Settings and configure the security settings if needed (e.g., WPA2-PSK with a passphrase).
- Configure the IPv4 Address of the LAN Interface of the wireless router:
 - IP Address: 192.168.0.1
 - Subnet Mask: 255.255.255.0
- DHCP:
 - Enable the DHCP server on the router so it can automatically assign IP addresses to IoT devices and other wireless clients.

Wireless Router0

PhysicalConfigGUIAttributes

Wireless-N Broadband RouterWRT300N

SetupSetupWirelessSecurityAccess RestrictionsApplications & GamingAdministrationStatus

Basic SetupDDNSMAC Address CloneAdvanced Routing

Internet Setup

Internet Connection type

Automatic Configuration - DHCP

Optional Settings
(required by some internet service providers)

Host Name:

Domain Name:

MTU:Size: 1500

Network Setup

Router IP

IP Address:

192.168.0.1

Subnet Mask:

255.255.255.0

DHCP Server Settings

DHCP Server:

Enabled

Disabled

DHCP Reservation

Start IP Address:

192.168.0.100

Maximum number of Users:

50

IP Address Range:

192.168.0.100 - 149

Client Lease Time:

0

minutes (0 means one day)

Help...

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Wireless Router0

PhysicalConfigGUIAttributes

Wireless-N Broadband RouterWRT300N

WirelessSetupWirelessSecurityAccess RestrictionsApplications & GamingAdministrationStatus

Basic Wireless SettingsWireless SecurityGuest NetworkWireless MAC FilterAdvanced Wireless Settings

Wireless Security

Security Mode:

WPA2 Enterprise

Encryption:

AES

RADIUS Server:

192.168.0.10

RADIUS Port:

1645

Shared Secret:

1234

Key Renewal:

3600

seconds

Help...

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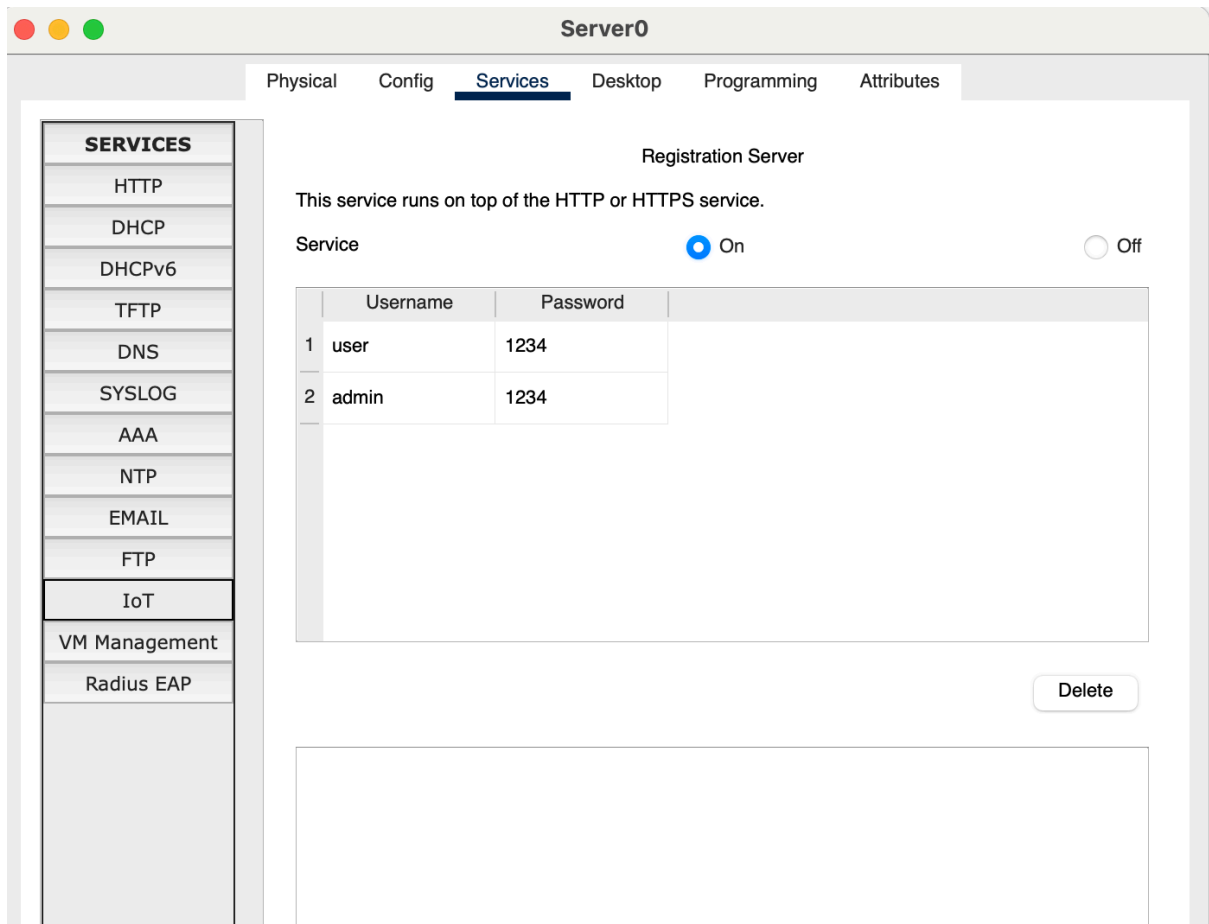
4. Configure the Server (Server1):

- Click on Server1, go to the Desktop tab, and select IP Configuration:
- Set the IP address to:
 - IP Address: 192.168.0.100
 - Subnet Mask: 255.255.255.0
 - Default Gateway: 192.168.0.1
- You can also configure additional services such as DHCP, HTTP, or DNS on the server if necessary.

The screenshot shows the 'Server0' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is active, displaying settings for both IPv4 and IPv6. The IPv4 configuration is set to 'Static' with an IP address of 192.168.0.10, a subnet mask of 255.255.255.0, and a default gateway of 0.0.0.0. The IPv6 configuration is also set to 'Static' with a link local address of FE80::240:BFF:FE26:2335. The 802.1X security section is currently disabled.

IP Configuration	
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	192.168.0.10
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	/
Link Local Address	FE80::240:BFF:FE26:2335
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

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5. Configure the Laptop (Laptop0):

- Click on Laptop0, go to the Desktop tab, and select IP Configuration.
- Set the IP address manually or let it get an IP via DHCP:
 - Manual Configuration:
 - IP Address: 192.168.0.101
 - Subnet Mask: 255.255.255.0
 - Default Gateway: 192.168.0.1
 - Or, enable DHCP on the laptop to receive an IP from the router automatically.

6. Configure the IoT Devices:

- For each IoT device (Fan, Door, Garage Door, Light, Window), follow these steps:
 - Click on the device, go to the Config tab, and set the SSID to home.
 - Assign IP addresses automatically by enabling DHCP on the wireless router, or manually assign IP addresses within the 192.168.0.x range for each IoT device:
 - Fan (IoT0): e.g., 192.168.0.102
 - Door (IoT1): e.g., 192.168.0.103
 - Garage Door (IoT4): e.g., 192.168.0.104
 - Light (IoT2): e.g., 192.168.0.105
 - Window (IoT3): e.g., 192.168.0.106
- Ensure that the devices can connect wirelessly by checking the SSID.

Server0

PhysicalConfigServicesDesktopProgrammingAttributes

SERVICES

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

AAA

Service

On

Off

Radius Port

1645

Network Configuration

Client NameClient IPSecretServerType

Radius

	Client Name	Client IP	Server Type	Key
1	Home	192.168.0.1	Radius	1234

Add

Save

Remove

User Setup

UsernamePassword

	Username	Password
1	Door	door
2	Fan	fan
3	GAR	gar
4	Skep	skep
5	Web	web

Add

Save

Remove

The screenshot shows the 'IoT0' configuration window with the 'Config' tab selected. The sidebar on the left has two main sections: 'GLOBAL' containing 'Settings', 'Algorithm Settings', and 'Files'; and 'INTERFACE' containing 'Wireless0' and 'Bluetooth'. The 'Wireless0' interface is selected, showing the following configuration fields:

- Display Name:** IoT0
- Serial Number:** PTT0810H9Z7-
- Interfaces:** Wireless0 (with a refresh icon)
- Gateway/DNS IPv4:**
 - ☒ DHCP
 - ☐ Static
 - Default Gateway:** 192.168.0.1
 - DNS Server:** 0.0.0.0
- Gateway/DNS IPv6:**
 - ☒ Automatic
 - ☐ Static
 - Default Gateway:** (empty field)
 - DNS Server:** (empty field)
- IoT Server:**
 - ☐ None
 - ☐ Home Gateway
 - ☒ Remote Server
 - Server Address:** 192.168.0.10
 - User Name:** admin
 - Password:** 1234

A 'Refresh' button is located at the bottom right of the configuration area.

7. Simulate IoT Device Functionality:

- You can control the IoT devices (Fan, Door, Light, Garage Door, Window) by using the IoT Monitor on the Laptop or Server to turn devices on or off.
- The IoT Monitor tool is available under the Laptop-PT's Desktop > IoT Monitor.

8. Configure Additional Server Features (Optional):

- You can configure HTTP, DNS, or DHCP services on the Server to simulate a more complex network.
- For example, enable a web server on Server1 to allow access to a web interface for controlling the IoT devices from the Laptop.

Summary of IP Address Allocation:

- WRT300N Router: 192.168.0.1
- Server-PT: 192.168.0.100
- Laptop-PT: 192.168.0.101
- IoT Devices:
 - Fan: 192.168.0.102

- Door: 192.168.0.103
- Garage Door: 192.168.0.104
- Light: 192.168.0.105
- Window: 192.168.0.106

