37 Wireless Fundamentals Configuration – Lab Exercise
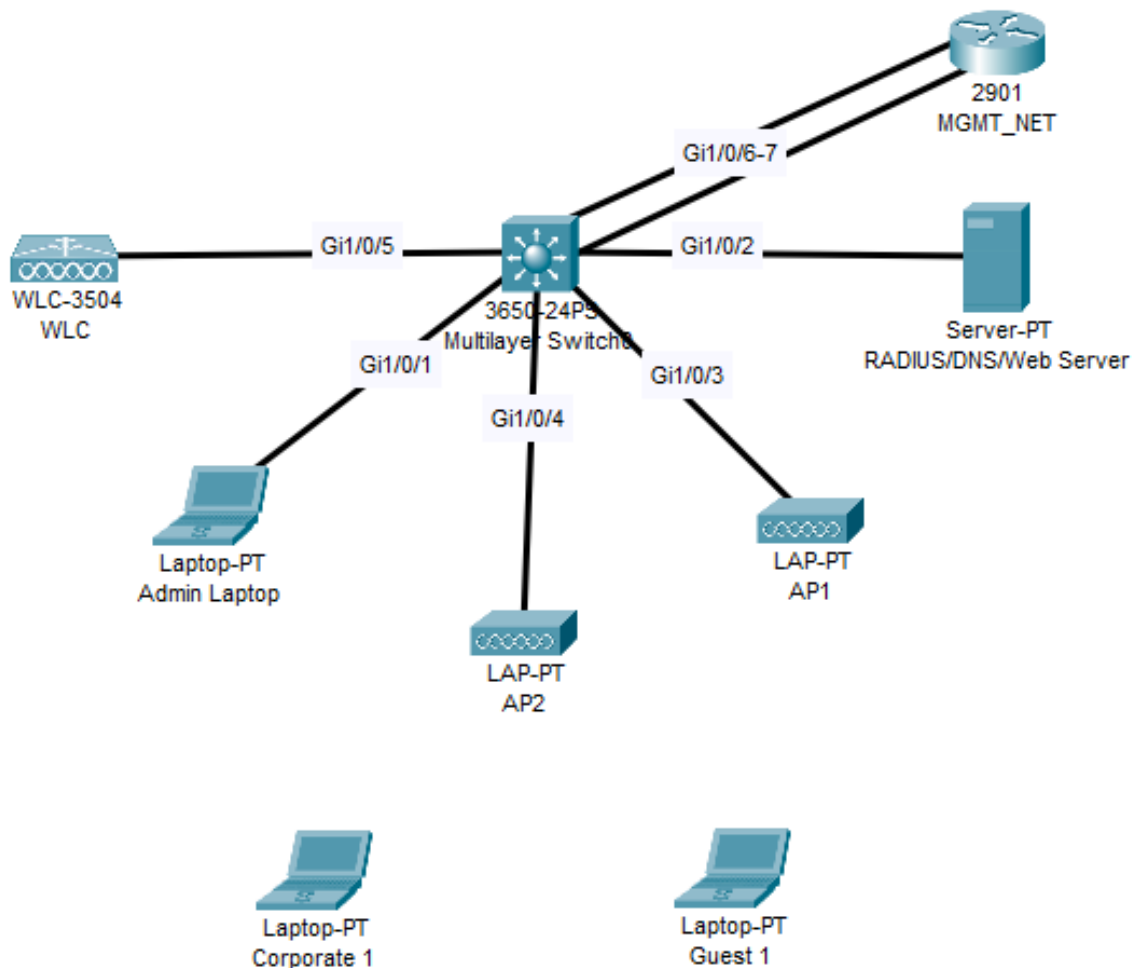
In this lab you will configure Corporate and Guest WLANs in a company campus.

Lab Topology

Load the Startup Configurations

Open the '37 Wireless Fundamentals Configuration.pkt' file in Packet Tracer to load the lab.

VLANs and IP subnets have already been set up for the company servers and IT administrators to connect via wired connections:

VLAN Name	VLAN Number	IP Subnet	Gateway (on switch)
Server	11	192.168.11.0/24	192.168.11.1
Admin	21	192.168.21.0/24	192.168.21.1

The IT administrators are restricted to wired connections for security reasons; an 'Admin' WLAN will not be created.

A new Wireless LAN Controller has been added to the network. Your colleague has already performed the initial setup at the command line to give the device IP address 192.168.10.11/24
Two Lightweight Wireless Access Points have just been unboxed and cabled to the Multilayer Switch.
Your job is to configure the new Corporate and Guest WLANs.

You can ignore the MGMT_NET router, it has been added to the lab to enable connectivity because Packet Tracer does not support trunk ports on the WLC.

Switch Configuration

1) On the multilayer switch, create a new VLAN for management of the wireless infrastructure devices. Use VLAN number 10 and name the VLAN 'Management'.

2) Create a VLAN interface on the multilayer switch to be used as the default gateway for the Management VLAN. Use IP address 192.168.10.1/24

3) On the 'Services > DNS' tab of the RADIUS/DNS/Web server, create a DNS A record which resolves the hostname 'cisco-capwap-controller' to the WLC's IP address 192.168.10.11.
   This will allow the Lightweight Access Points to resolve the IP address of the WLC during the Zero Touch Provisioning process.

4) On the Admin laptop, open a Command Prompt and test the DNS entry using the 'nslookup' command. After a pause, it should resolve the name cisco-capwap-controller to 192.168.10.11. (Note that you cannot ping the WLC yet.)

5) You will create a WLAN for Corporate users (staff members) later in this lab exercise. Create a new VLAN for the staff users on the multilayer switch. Use VLAN number 22 and name the VLAN 'Corporate'.

6) Create a VLAN interface on the multilayer switch to be used as the default gateway for the Corporate VLAN. Use IP address 192.168.22.1/24

7) You will also create a WLAN for guest users (non-staff members) later in this lab exercise. Create a new VLAN for the guest users. Use VLAN number 23 and name the VLAN 'Guest'.

8) Create a VLAN interface on the multilayer switch to be used as the default gateway for the Guest VLAN. Use IP address 192.168.23.1/24

9) Verify you now have these VLANs and VLAN interfaces configured:

VLAN Name	VLAN Number	IP Subnet	Gateway (on switch)
Management	10	192.168.10.0/24	192.168.10.1
Server	11	192.168.11.0/24	192.168.11.1
Admin	21	192.168.21.0/24	192.168.21.1
Corporate	22	192.168.22.0/24	192.168.22.1
Guest	23	192.168.23.0/24	192.168.23.1

10) Port GigabitEthernet1/0/5 on the multilayer switch is connected to the WLC Wireless LAN Controller.
Configure the port to support the Corporate and Guest WLANs and management of the Wireless Access Points.
The spanning tree protocol should not check for possible layer 2 loops on the port.

11) Port GigabitEthernet1/0/3 and GigabitEthernet1/0/4 on the multilayer switch are connected to the Lightweight Access Points.
Configure the ports to support the Corporate and Guest WLANs and management of the Wireless Access Points.
The spanning tree protocol should not check for possible layer 2 loops on the port.

Wireless LAN Controller and RADIUS Server Integration

12) Check you can ping the Wireless LAN Controller at 192.168.10.11 from the Admin laptop.

13) Open https://cisco-capwap-controller (use https, not http) in a web browser window on the Admin laptop to open the Wireless LAN Controller administration GUI.
Login with username **admin** and password **Flackbox1**
If you get a 'Host Name Unresolved' error message then close the web browser window, then reopen it and try again.

14) On the dashboard Summary page and the Wireless page, verify the two Access Points have registered with the WLC. (You can ignore it if you see two extra APs, this is a Packet Tracer glitch.)

15) Add the RADIUS AAA server at 192.168.11.10 to the Wireless LAN Controller.
Your colleague has already added the Wireless LAN Controller as a client on the RADIUS server with shared secret **Flackbox1**.
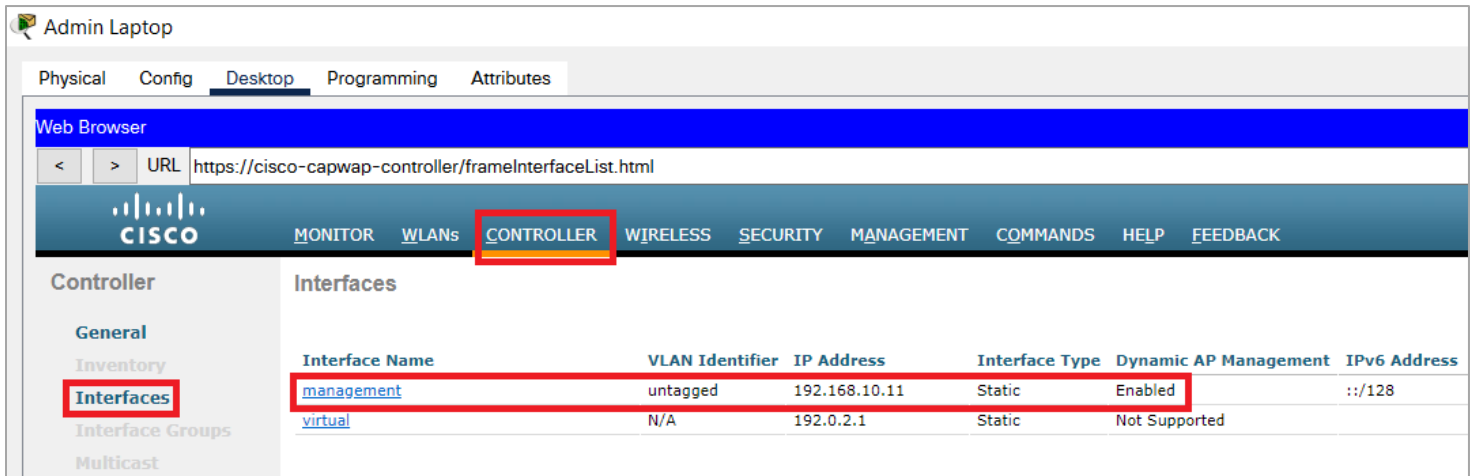
DHCP on Wireless LAN Controller

In Packet Tracer, the WLC automatically creates a DHCP scope with the name 'day0-dhcp-mgmt' which is used for the Lightweight Access Points to retrieve their IP address and DNS server info through the Zero Touch Provisioning process. On real hardware this DHCP scope will not exist by default.

16) Wireless DHCP clients can receive their IP address from an external DHCP server or from the Wireless LAN Controller.
Configure a DHCP scope on the WLC for Corporate wireless clients with the address range 192.168.22.101 to 192.168.22.254.
Configure a DNS server with IP address 192.168.11.10.
Enter all other relevant details.

17) Configure a DHCP scope on the WLC for Guest wireless clients with the address range 192.168.23.101 to 192.168.23.254.
Configure a DNS server with IP address 192.168.11.10.
Enter all other relevant details.

Logical Interfaces on the Wireless LAN Controller

The management interface is preconfigured to be untagged because the Packet Tracer WLC does not support trunk ports.

On the Multilayer switch the native VLAN for the port is already set to the management VLAN 10.

```
Switch#show run
! truncated
interface GigabitEthernet1/0/5
description WLC
switchport trunk native vlan 10
switchport trunk allowed vlan 10,22-23
switchport trunk encapsulation dot1q
switchport mode trunk
spanning-tree portfast trunk
```

18) Create a logical interface on the Wireless LAN Controller in the Corporate VLAN, with IP address 192.168.22.11 and gateway 192.168.22.1.
Wireless clients on the Corporate VLAN should get an IP address from the management interface of the Wireless LAN Controller.

19) Create a logical interface in the Guest VLAN with IP address 192.168.23.11 and gateway 192.168.23.1.
Wireless clients on the Guest VLAN should get an IP address from the management interface of the Wireless LAN Controller.

Wireless LANs

20) Create the wireless LAN named 'Corporate'. Clients should be authenticated by the 192.168.10.11 RADIUS server you added earlier, and WPA2 AES encryption should be used.

21) Create the wireless LAN named 'Guest'. WPA2 AES encryption should be used, and clients should authenticate with the pre-shared key **Flackbox3**.

22) Save the configuration of the Wireless LAN Controller Packet Tracer lab, close Packet Tracer, and then open the lab exercise again. (Otherwise the WLAN clients will probably get no IP from their DHCP server.)

Join Clients to the Wireless LANs

23) A username **Flackbox** with password **Flackbox2** has been configured on the RADIUS server.
Connect to the 'Corporate' WLAN from the Corporate1 laptop using this username.

24) Connect to the 'Guest' WLAN from the Guest1 laptop.

25) Verify connectivity by pinging the Corporate1 laptop from the Guest1 laptop.