Scenario 5 – Dynamic VLAN Assignment

NOTE: Before beginning to configure the Switch and AP, remember to reset all the configurations to factory default.
To reset the switch configuration, click the **Tools** menu and select **Reset Configuration**, or with the "clear config" command
To reset the AP configuration, you will need to telnet into the AP CLI and use the "factory-reset" command

This scenario will show you when and how to use the Dynamic VLAN Assignment function.

The objectives in this setup are as follows:
- To understand how to use dynamic vlan function
- To know how to set up the RADIUS server for Dynamic VLAN environment
- Different users assign to Different VLAN
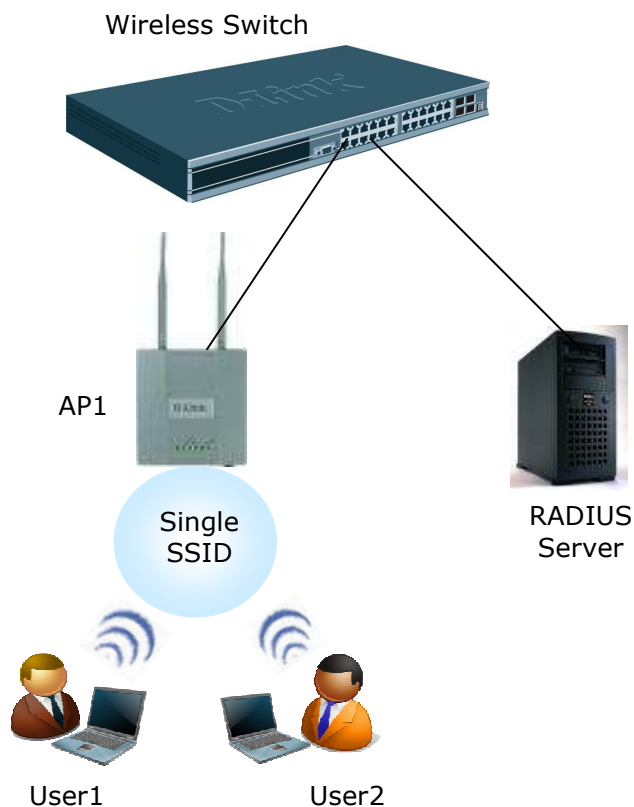
An overview of the configuration steps needed for Unified Switch and APs are as follows:

5.1 Configure VLAN Settings

5.1 Configure VLAN Settings

All of the features you configure in this section are within the **LAN** tab on the D-LINK Unified Switch.

5.1.1 Configure the VLANs

The summary information for the VLAN configuration is shown in following table

VLAN ID	VLAN Name	Include Ports	IP Address
VLAN 100 (Interface 4/1)	AP1	Port 0/1 and 0/9 (Untagged)	192.168.100.254
VLAN 101 (Interface 4/2)	User Group 1	Port 0/1 (Tagged)	192.168.101.254
VLAN 102 (Interface 4/3)	User Group 2	Ports 0/1 (Tagged)	192.168.102.254

Use the following steps to create and configure VLAN 100, and then repeat them to configure VLAN 101, 102. Refer to the table for information about what value to configure for each VLAN.
a. From the LAN tab on the switch Web interface, click **L2 Features > VLAN > VLAN Configuration**.
b. Select **Create** from **VLAN ID and Name** dropdown menu.
c. Enter the **VLAN ID.**
d. Enter **VLAN Name.**
e. On the Slot/Port row, select **0/1** choose **Include** from the **Participation** dropdown menu, Tagging menu select **Untagged,** repeat to port **0/9**
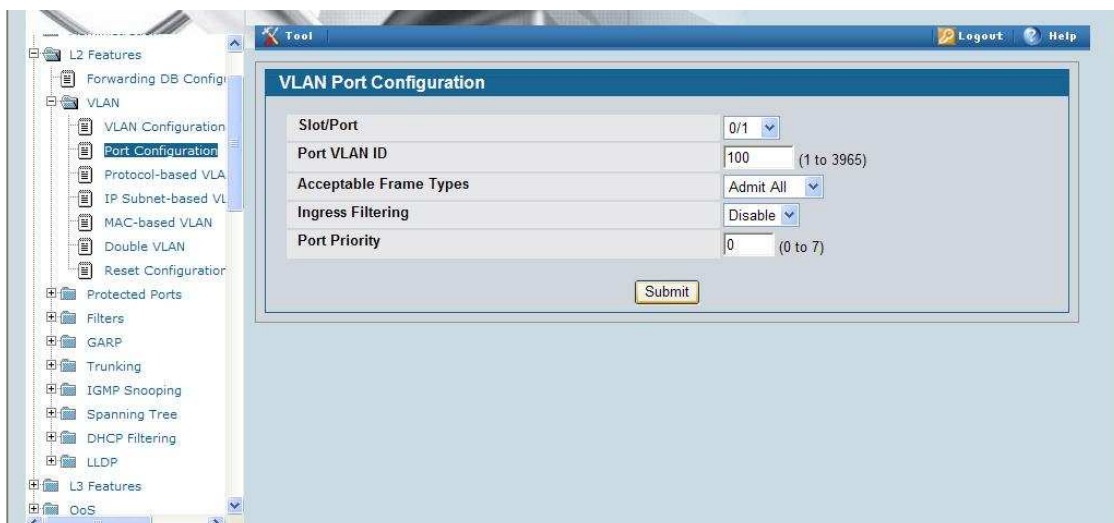f. Click **Submit.**
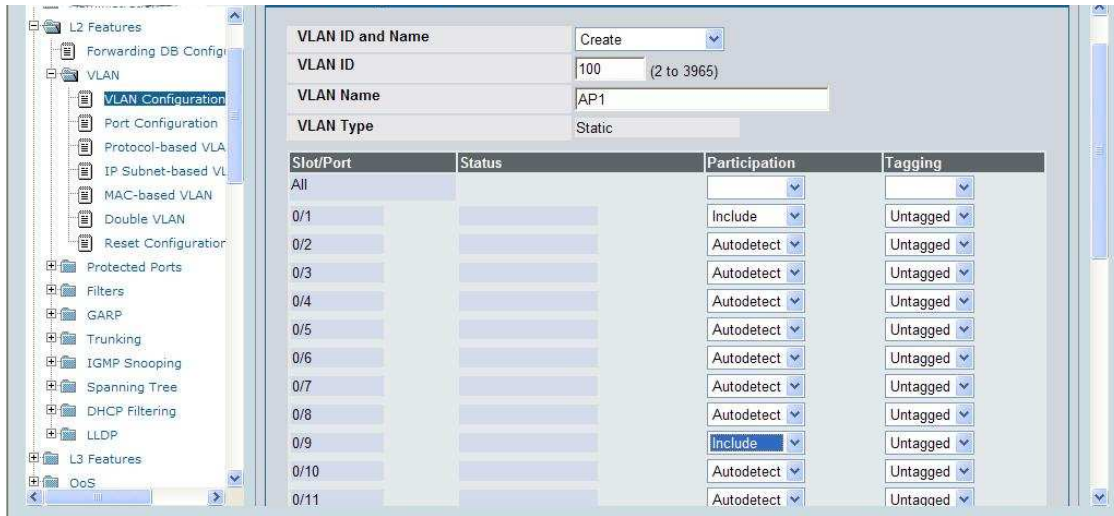
Repeat the steps to create VLAN 101 and 102.

5.1.2 Configure PVID

Configure the Port VLAN ID for ports 0/1, 0/9

a. From the LAN tab on the switch Web interface, click **L2 Features > VLAN > Port Configuration**.

   - Select port 0/1 from the Slot/Port dropdown menu.
   - Enter 100 in the **Port VLAN ID** field.
   - Click **Submit**.

b. Select port 0/9 from the Slot/Port dropdown menu.
- Enter 100 in the **Port VLAN ID** field.
- Click **Submit**.

5.2 Configure VLAN Routing

5.2.1 Create Routing Interface

To configure the new VLAN routing interfaces, use the following steps.

a. Select the LAN tab from the navigation panel and click **L3 Features > VLAN Routing Configuration**.
b. To create a routing interface for VLAN 100, enter 100 into the **VLAN ID** field and select **Create**.
This creates a logical routing interface with the slot/port designation of 4/1 for VLAN 100.
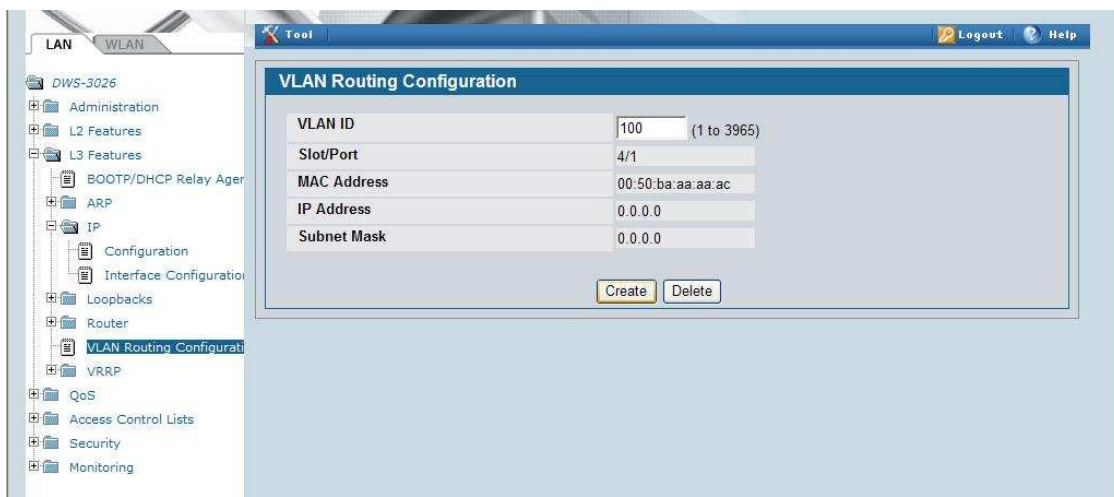
c. Repeat the previous step to create the VLAN routing interfaces for VLAN 101 and 102

5.2.2 Configure Routing Interface

Navigate to **L3 Features > IP > Interface Configuration**.

a. Select interface 4/1 from the Slot/Port dropdown menu and enter the following information:

- IP Address: 192.168.100.254

- Subnet Mask: 255.255.255.0
- Routing Mode: Enable

Click **Submit**.

b. Select interface 4/2 from the Slot/Port dropdown menu and enter the following information:

- IP Address: 192.168.101.254
- Subnet Mask: 255.255.255.0
- Routing Mode: Enable

Click **Submit**.

c. Select interface 4/3 from the Slot/Port dropdown menu and enter the following information:

- IP Address: 192.168.102.254
- Subnet Mask: 255.255.255.0
- Routing Mode: Enable

Click **Submit**.

5.2.3 Enable Global Routing

You need to enable the routing mode to allow the switch to operate as a L3 device in this scenario. To do this, navigate to the **L3 Features > IP > Configuration**

5.3 Setup DHCP Server

5.3.1 Enable DHCP Server

Use the following procedures to configure the global DHCP settings.

a. Select the LAN tab from the navigation panel and access **Administration → DHCP Server → Global Configuration**, enable the **Admin Mode**

b. Add the excluded addresses as following:
   - From 192.168.100.100 to 192.168.100.255
   - From 192.168.101.100 to 192.168.101.255
   - From 192.168.102.100 to 192.168.102.255
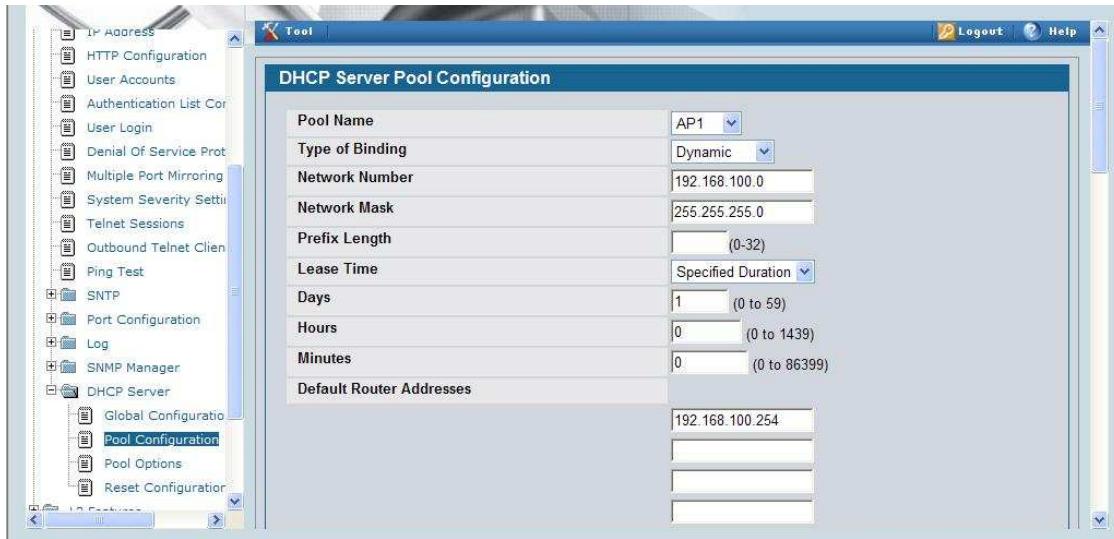
5.3.2 Pool Configuration

This section describes how to configure the address pool for the wireless clients.

a. Select **Pool Configuration** in the Navigation tree.

Select **create** and specify the following settings:
- **Pool Name** – AP1
- **Type of Binding** - Dynamic
- **Network Number** – 192.168.100.0
- **Network Mask** - 255.255.255.0
- **Default Router Addresses** – 192.168.100.254

Click **Submit** to create the address pool.

b. From the Pool Configuration, select **create** and specify the following settings:

  - **Pool Name** – User Group 1
  - **Type of Binding** - Dynamic
  - **Network Number** – 192.168.101.0
  - **Network Mask** - 255.255.255.0
  - **Default Router Addresses** – 192.168.101.254

Click **Submit** to create the address pool.

c. From the Pool Configuration, select **create** and specify the following settings:

  - **Pool Name** – User Group 2
  - **Type of Binding** - Dynamic
  - **Network Number** – 192.168.102.0
  - **Network Mask** - 255.255.255.0
  - **Default Router Addresses** – 192.168.102.254

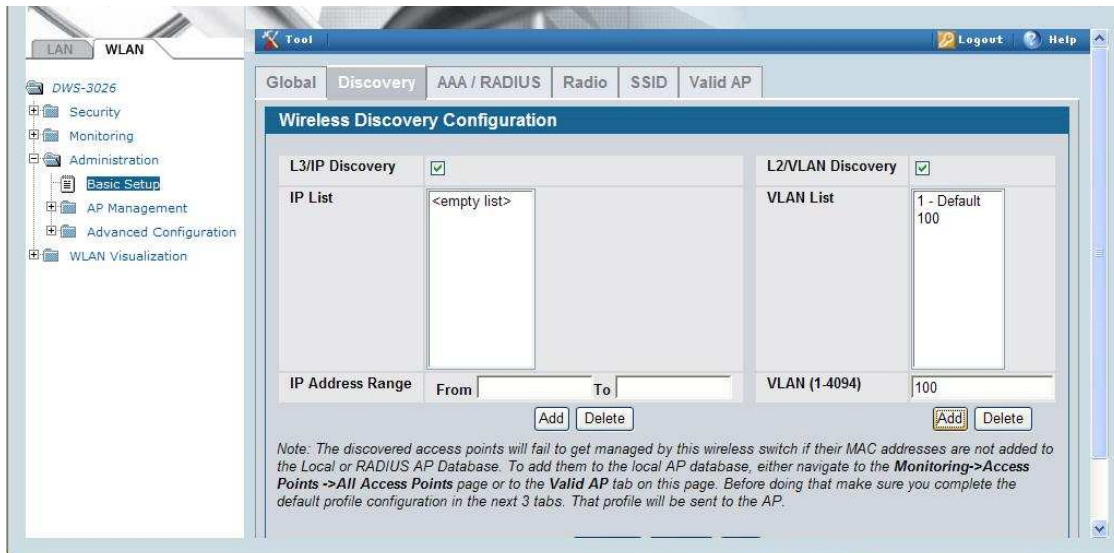Click **Submit** to create the address pool.

5.4 Configure WLAN Settings

5.4.1 Add L2 Discovery

Use the following steps to configure the Unified Switch and the APs.

a. Go to **WLAN** tab > **Administration > Basic Setup** page, click **Discovery** tab.
b. Add VLAN 100 to the **L2/VLAN Discovery** (to allow automatic discovery of the APs connected to ports on VLAN 100), then click **Submit**.



5.4.2 Configure RADIUS Server

Click **Next** to go to **AAA/RADIUS** page, enter 192.168.100.100 as the **IP Address** of RADIUS Server, **Secret** equal to 12345678
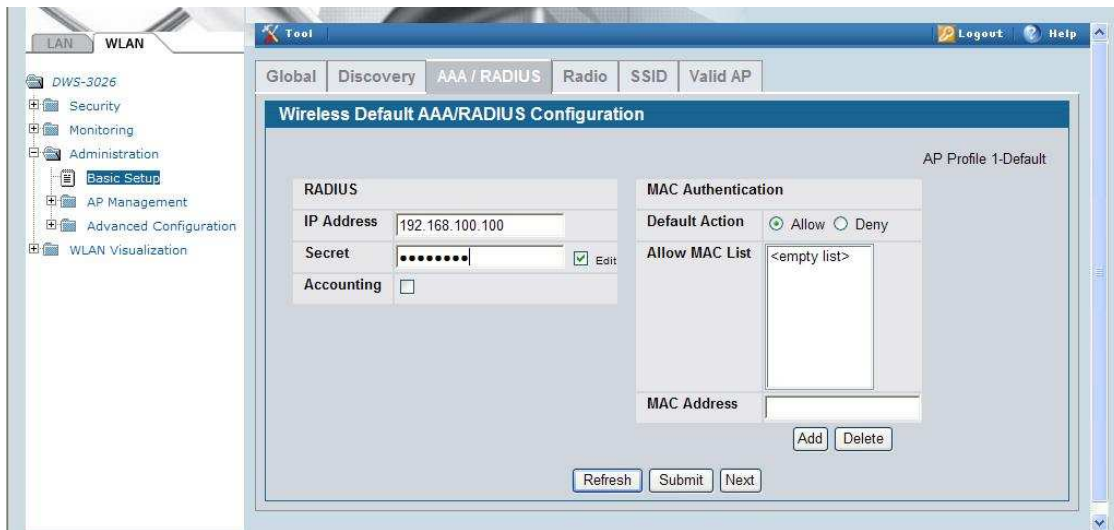
5.4.3 Configure WLAN settings

a. Click the **SSID** tab to configure the VAP and Network settings
b. Select the 802.11b/g radio.
c. Select the check box next to **1-Guest Network** and click **Edit**.
d. Change the following Network parameters and select **Submit**:

 - **SSID**: S5-Group1-DVLAN (depend on your group.)
 - **Security**: WPA/WPA2 – WPA Enterprise
 - **WPA Versions**: WPA & WPA2
 - **WPA Ciphers**: TKIP & CCMP
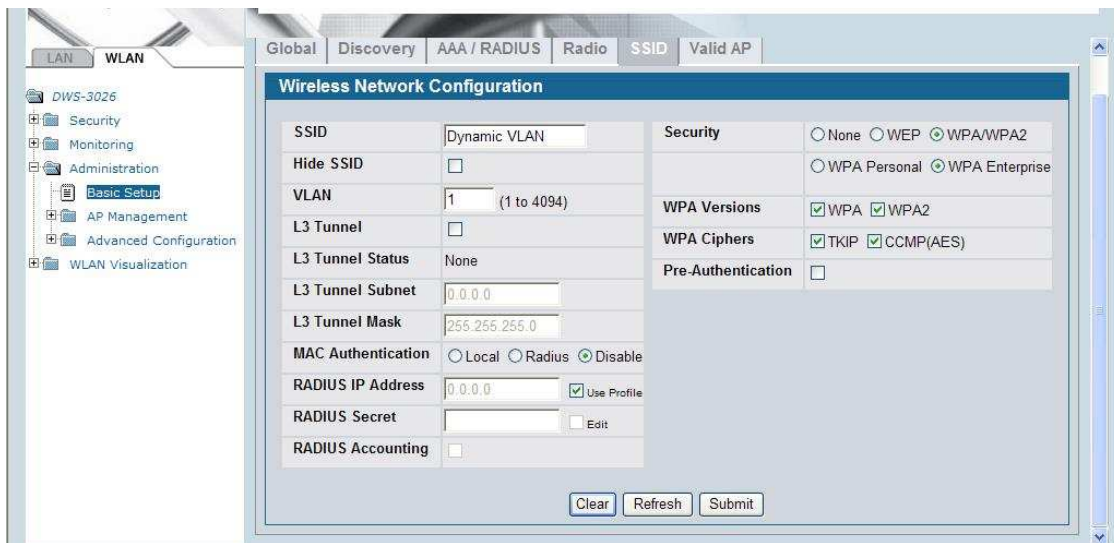
5.5 Setup RADIUS Servers

a. Setup the IP address of your RADIUS server to 192.168.100.100/24
b. Add a client entry to the FreeRADIUS server, **client.conf** file for the 192.168.0.0/16
network:

```
client 192.168.0.0/16 {
    secret          = 12345678
    shortname   = private-network-1
}
```

c. Add a user to the the users.conf file for the User Group 1 as following:

```
DVLANUser1 User-Password == "12345678"
          Tunnel-Type = "VLAN",
          Tunnel-Medium-Type = "IEEE-802",
          Tunnel-Private-Group-Id = "101",
```

d. Add a user to the the users.conf file for the User Group 2 as following:

```
DVLANUser2 User-Password == "12345678"
         Tunnel-Type = "VLAN",
         Tunnel-Medium-Type = "IEEE-802",
         Tunnel-Private-Group-Id = "102",
```

e. Save and restart your RADIUS server

5.6 Device Connections

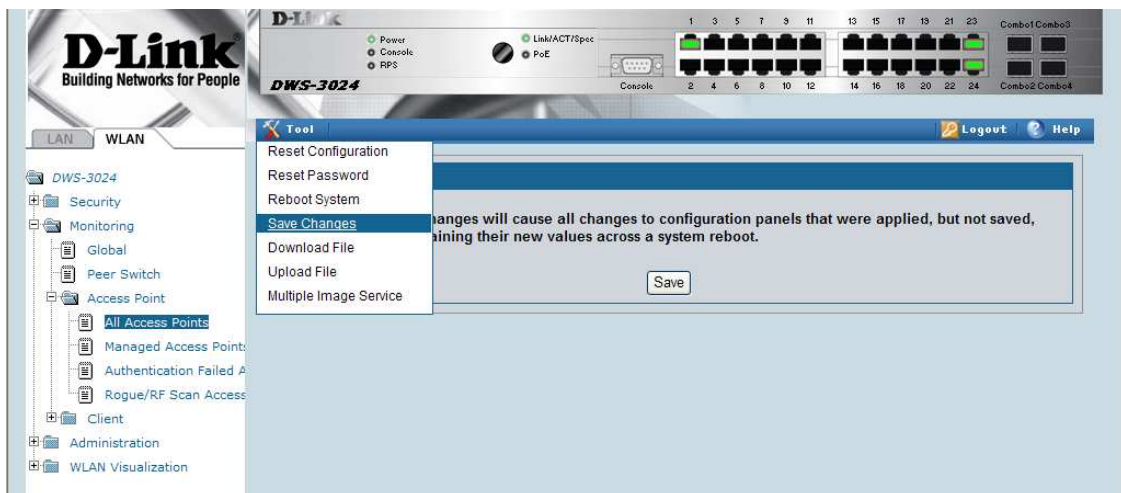### 5.6.1 Connect AP and RADIUS Server

a. Connect AP1 to **port 1** of the switch
b. Connect the RADIUS to **port 9** of the Wireless Switch.

5.6.2 Manage APs

Wait about 60 seconds and click **Monitoring > Access Points > All Access Points**, check AP1's MAC Address and click **Manage**

5.6.3 Save Changes

Save the switch configuration

5.7 Verify Configuration

a. Follow 3.11.2, connect a wireless client to the S5-Group1-DVLAN, enter the username and password as **DVLANUser1**, **12345678**

b. Make sure you get the IP address belong to 192.168.101.0/24 subnet, then ping 192.168.100.100.

c. Follow 3.11.2, connect another wireless client to the S5-Group1-DVLAN, enter the username and password as **DVLANUser2**, **12345678**

d. Make sure you get the 192.168.102.0/24 IP address.

e. Ping between both wireless clients