



HOW TO CREATE VOICE VLANS AND ENABLE THEM AS DHCP SERVER ON ALLOY AS RANGE SWITCHES VIA THE WEB GUI

1. Introduction

The purpose of this document is to outline the procedure of to configure voice VLAN's on Alloy AS range switches using LLDP and enabling the switches DHCP server on the voice VLAN, while the normal LANs DHCP is distributed via the router or

This Technical Note will go through steps such as logging into the switch, creating the Voice VLANs, LLDP settings, LLDP-MED, adding new IP range, enabling DHCP server settings as well as how to verify it is configured correctly.

This document will focus on how to create Voice VLAN's and enabling the DHCP server via the Web GUI, however it can also be created through the CLI and configuration files.



Contents

1. Introduction.....	1
2. Log-in, Disabling CIST on Voice VLAN Ports.....	3
3. Enabling Voice VLANS.....	4
4. Set the Voice VLAN OUI.....	5
5. Enabling LLDP	6
6. Configuring LLDP-MED.....	7
7. Verify Voice VLAN and LLDP Configuration	8
8. Configuring IP Interfaces	9
9. Add VLAN Mode	10
10. Excluded IP Configuration	11
11. DHCP Server Pool Configuration.....	12
12. Port VLAN Configuration	13
13. Check via MAC Table and Neighbour cache	14

2. Log-in, Disabling CIST on Voice VLAN Ports

Open the web browser and enter the IP of the switch (by default 192.168.1.1) enter “**admin**” as username and leave the password field blank.

← → ↻ Not secure | 192.168.1.1/login.htm ☆



ALLOY

admin

Password

Login

For Voice VLAN’s to be enabled, you first must disable CIST on the switch ports you wish to enable Voice VLAN’s on. To do this follow the steps below.

- Log into the web GUI of the Switch
- Enter in the the admin credentials
- Select **Configuration** → **Spanning Tree** -> **CIST Port**
- Under the heading **CIST Normal Port Configuration** Disable the ports you wish to use for Voice VLANs unchecking the STP enable option. In case you want to use all ports, untick the * entry. Scroll down and select **Save**

← → ↻ 192.168.1.1/mstp_port_config.htm ☆

Configuration

- » System
- » Green Ethernet
- » Ports Configuration
- » DHCP
- » Security
- » Aggregation
- » Loop Protection
- » Spanning Tree
- » Bridge Settings
- » MSTI Mapping
- » MSTI Priorities
- » CIST Port
- » MSTI Ports
- » IPMC Profile
- » MVR
- » IPMC
- » LLDP
- » PoE
- » MAC Table
- » VLANs

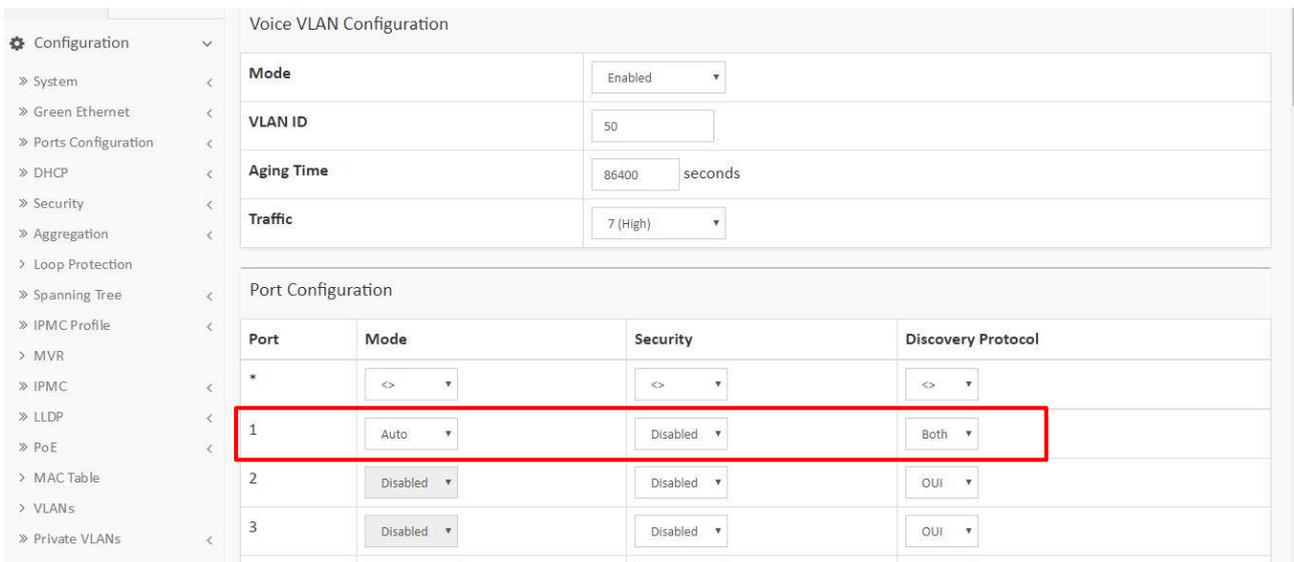
Port	STP Enabled	Path Cost	Priority	Admin Edge	Auto Edge	Restricted			Point-to-point
						Role	TCN	BPDU Guard	
-	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Forced True
CIST Normal Port Configuration									
Port	STP Enabled	Path Cost	Priority	Admin Edge	Auto Edge	Restricted			Point-to-point
						Role	TCN	BPDU Guard	
*	<input checked="" type="checkbox"/>	<>	<>	<>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<>
1	<input type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
2	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
3	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
4	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
5	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
6	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto

3. Enabling Voice VLANS

Now that the CIST ports have been disabled, you can then enable Voice VLAN's on the switch, and the individual ports you wish to enable the Voice VLAN's onto.

To enable this, follow the steps below.

- Select **Configuration** -> **Voice VLAN** → **Configuration**
Under Voice VLAN Configuration
- **Mode: Enabled**
Under Port Configuration
- To enable the port select Mode to either **Forced** or **Auto** Enabled.
- Discovery Protocol : **Both**
- Select **Apply**



The screenshot displays the configuration interface for Voice VLANs. On the left is a navigation menu with 'Configuration' selected. The main area is divided into two sections: 'Voice VLAN Configuration' and 'Port Configuration'.

Voice VLAN Configuration:

Mode	Enabled
VLAN ID	50
Aging Time	86400 seconds
Traffic	7 (High)

Port Configuration:

Port	Mode	Security	Discovery Protocol
*	<>	<>	<>
1	Auto	Disabled	Both
2	Disabled	Disabled	OUI
3	Disabled	Disabled	OUI

A red rectangle highlights the configuration for Port 1, showing Mode set to 'Auto', Security set to 'Disabled', and Discovery Protocol set to 'Both'.

4. Set the Voice VLAN OUI

To be able to automatically assign IP Handsets to the Voice VLAN's they need to have their OUI added to the OUI table. By default with the AS Range Grandstream, Snom and Yealink are automatically added. However if you wish to add any other IP Handsets this is done via this section.

To Add OUI's to the table follow the steps below.

- Select **Configuration** → **Voice VLAN** → **OUI**
- To add a new Entry, click **Add New Entry**
- Click **Apply** To save

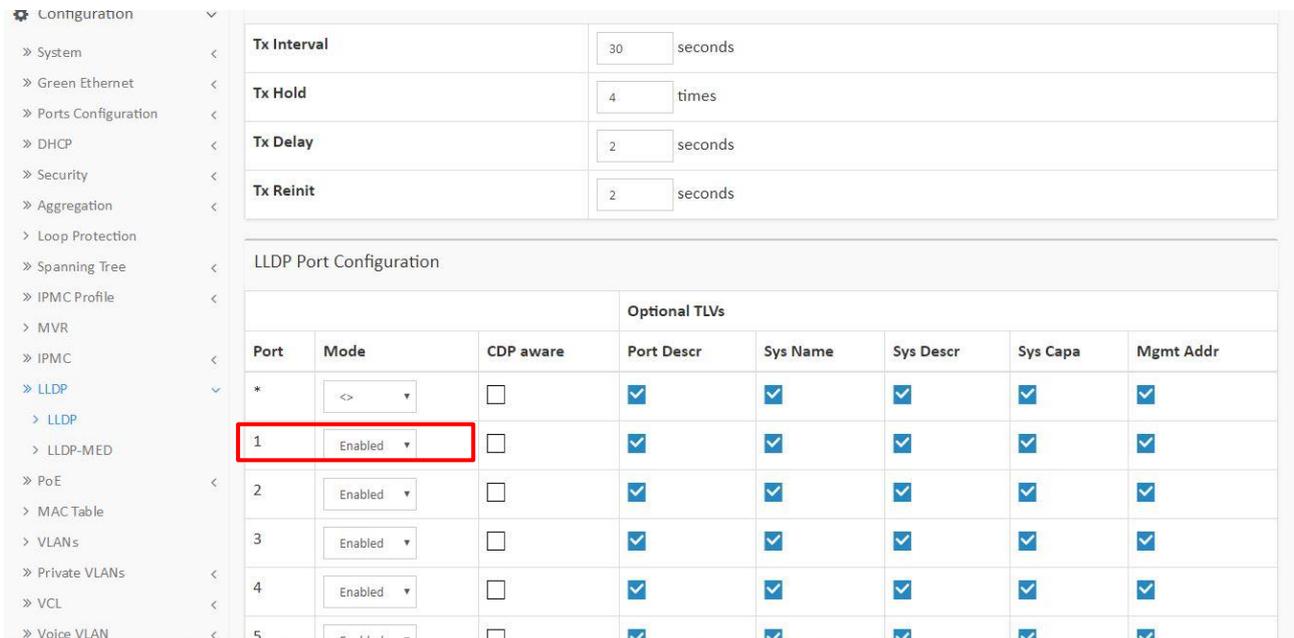
The screenshot shows the ALLOY web interface for device AS5048-P. The main content area is titled "Voice VLAN OUI Table" and contains a table with three columns: "Delete", "Telephony OUI", and "Description". The table lists three entries: Grandstream (00-0b-82), Snom (00-04-13), and Yealink (00-15-65). Below the table are buttons for "Add New Entry", "Apply", and "Reset". A left sidebar shows a navigation menu with "Configuration" selected. The top of the interface includes the ALLOY logo, a navigation menu icon, and a breadcrumb trail: Home > Configuration > Voice VLAN > OUI.

Delete	Telephony OUI	Description
<input type="checkbox"/>	00-0b-82	Grandstream
<input type="checkbox"/>	00-04-13	Snom
<input type="checkbox"/>	00-15-65	Yealink

5. Enabling LLDP

LLDP allows IP Phones to be automatically assigned VLAN's based on their OUI.
To enable LLDP on the switch, follow the steps below.

- Select the **Configuration** → **LLDP** → **LLDP Menu**
Under LLDP Port Configuration
- Change the mode to **Enabled** to enable LLDP for the selected ports.
- Select **Apply**.



Configuration

- » System
- » Green Ethernet
- » Ports Configuration
- » DHCP
- » Security
- » Aggregation
- > Loop Protection
- » Spanning Tree
- » IPMC Profile
- > MVR
- » IPMC
- » LLDP
 - > LLDP
 - > LLDP-MED
- » PoE
- > MAC Table
- > VLANs
- » Private VLANs
- » VCL
- » Voice VLAN

Tx Interval: 30 seconds

Tx Hold: 4 times

Tx Delay: 2 seconds

Tx Reinit: 2 seconds

LLDP Port Configuration

Port	Mode	CDP aware	Optional TLVs				
			Port Descr	Sys Name	Sys Descr	Sys Capa	Mgmt Addr
*	<>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
1	Enabled	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
2	Enabled	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
3	Enabled	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
4	Enabled	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
5	Enabled	<input type="checkbox"/>	<input checked="" type="checkbox"/>				

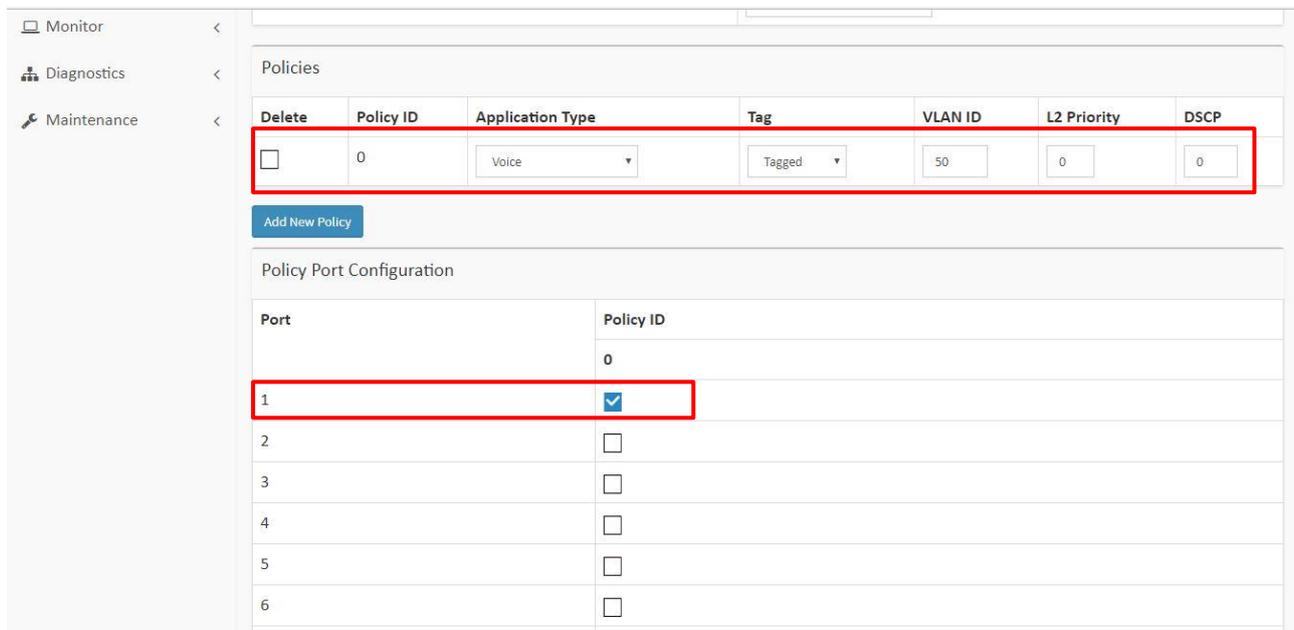
6. Configuring LLDP-MED

From the LLDP-MED menu, first you need to create a policy.

What the Policy will do is allow you to setup the VLAN ID to be assigned automatically to the LLDP device, in the above example when a device is configured to use LLDP, it will be assigned the VLAN of 50 as tagged, and the QoS will be set to Voice.

To configure LLDP-MED, follow the below steps.

- **Configuration** → **LLDP** → **LLDP-MED**
- Scroll down to Policies, and select **Add New Policy**.
- Enter the **Policy ID**, and the VLAN information you wish to assign such as Tagged or Untagged, VLAN ID.
- Configuring the Switch ports to use the policies
- Select **Apply** to save



The screenshot displays the configuration interface for LLDP-MED. On the left, there is a navigation menu with 'Monitor', 'Diagnostics', and 'Maintenance'. The main area is titled 'Policies' and contains a table with the following columns: Delete, Policy ID, Application Type, Tag, VLAN ID, L2 Priority, and DSCP. A red box highlights the first row of this table, which has a delete checkbox, Policy ID '0', Application Type 'Voice', Tag 'Tagged', VLAN ID '50', L2 Priority '0', and DSCP '0'. Below the table is an 'Add New Policy' button. Underneath, there is a 'Policy Port Configuration' section with a table listing ports 1 through 6. A red box highlights the row for port 1, where the 'Policy ID' column contains a checked checkbox.

Delete	Policy ID	Application Type	Tag	VLAN ID	L2 Priority	DSCP
<input type="checkbox"/>	0	Voice	Tagged	50	0	0

Add New Policy

Port	Policy ID
	0
1	<input checked="" type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4	<input type="checkbox"/>
5	<input type="checkbox"/>
6	<input type="checkbox"/>

7. Verify Voice VLAN and LLDP Configuration

To verify all of the above has worked this can be done via the web interface, or via the CLI of the switch. To check via CLI, you can connect to the switch via Telnet, SSH or Console.

Once logged in, issue the **show mac address-table** command, below is an example of Yealink IP Phones setup on VLAN 50 configured with LLDP.

```
AS5048-P# show mac address-table
Type      VID  MAC Address          Ports
Static    1    33:33:00:00:00:01    GigabitEthernet 1/1-48 CPU
Static    1    33:33:00:00:00:02    GigabitEthernet 1/1-48 CPU
Static    1    33:33:ff:00:dd:61    GigabitEthernet 1/1-48 CPU
Dynamic   1    50:e5:49:c5:d5:6e    GigabitEthernet 1/46
Static    1    ff:ff:ff:ff:ff:ff    GigabitEthernet 1/1-48 CPU
Static    50   00:15:65:47:65:0d    GigabitEthernet 1/1
Static    50   33:33:00:00:00:01    GigabitEthernet 1/1-48 CPU
Static    50   33:33:00:00:00:02    GigabitEthernet 1/1-48 CPU
Static    50   33:33:ff:00:dd:61    GigabitEthernet 1/1-48 CPU
Static    50   ff:ff:ff:ff:ff:ff    GigabitEthernet 1/1-48 CPU
AS5048-P#
```

To view via the CLI, follow the steps below.

- **Monitor** → **MAC Table**

Start from VLAN and MAC address , entries per page.

Type	VLAN	MAC Address	Port Members																						
			CPU	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	2	
Static	1	33-33-00-00-00-01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Static	1	33-33-00-00-00-02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Static	1	33-33-FF-00-DD-61	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dynamic	1	50-E5-49-C5-D5-6E																							
Static	1	FF-FF-FF-FF-FF-FF	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Static	50	00-15-65-47-65-0D		✓																					
Static	50	33-33-00-00-00-01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Static	50	33-33-00-00-00-02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Static	50	33-33-FF-00-DD-61	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Static	50	FF-FF-FF-FF-FF-FF	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

8. Configuring IP Interfaces

To be able to distribute the voice VLAN IP-addresses from the Switch we have to add the IP address range to the IP Interfaces table.

- **Configuration** → **IP** → **Add Interface**
- Enter **VLAN ID** → **IPv4 IP range and Mask**
- Press **Apply**

Configuration

- > System
- > Information
- > IP
- > NTP
- > Time
- > Log
- > Green Ethernet
- > Ports Configuration
- > DHCP
- > Security
- > Aggregation
- > Loop Protection
- > Spanning Tree
- > IPMC Profile

DNS Server Configured ▼ 8.8.8.8

DNS Proxy

IP Interfaces

Delete	VLAN	IPv4 DHCP			IPv4		IPv6	
		Enable	Fallback	Current Lease	Address	Mask Length	Address	Mask Length
<input type="checkbox"/>	1	<input type="checkbox"/>	0		192.168.1.1	24		
<input type="checkbox"/>	50	<input type="checkbox"/>	0		192.168.50.1	24		

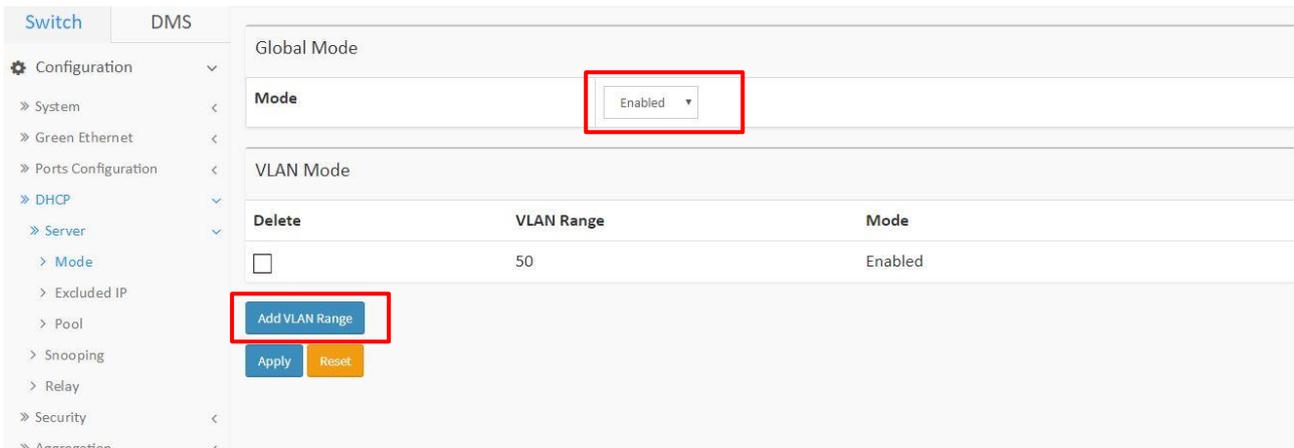
[Add Interface](#)

IP Routes

9. Add VLAN Mode

In the DHCP Server we add now the VLAN range.

- **Configuration** → **DHCP** → **Server** → **Mode**
- Choose **Add VLAN Range**
- Enter **50** into the first field, the 2nd leave **blank**
- Change from **Disabled** to **Enabled**
- **Apply**



The screenshot shows the configuration page for the DHCP Server. The left sidebar contains a navigation menu with 'Switch' and 'DMS' tabs. Under 'DMS', the 'Configuration' section is expanded to show 'Server' > 'Mode'. The main content area is titled 'Global Mode' and has a 'Mode' dropdown menu set to 'Enabled'. Below this is the 'VLAN Mode' section, which contains a table with columns 'Delete', 'VLAN Range', and 'Mode'. The table has one row with a checkbox, the value '50', and 'Enabled'. Below the table are buttons for 'Add VLAN Range', 'Apply', and 'Reset'. Red boxes highlight the 'Enabled' dropdown and the 'Add VLAN Range' button.

Delete	VLAN Range	Mode
<input type="checkbox"/>	50	Enabled

10. Excluded IP Configuration

Under Excluded IP the range for the fixed IP addresses will be added now.

- **Configuration** → **DHCP** → **Server** → **Excluded IP**
- Choose **Add IP Range**
- Enter **the desired IP Range** you want to **exclude** (e.g. 192.168.50.1-192.168.50.100)
- **Apply**



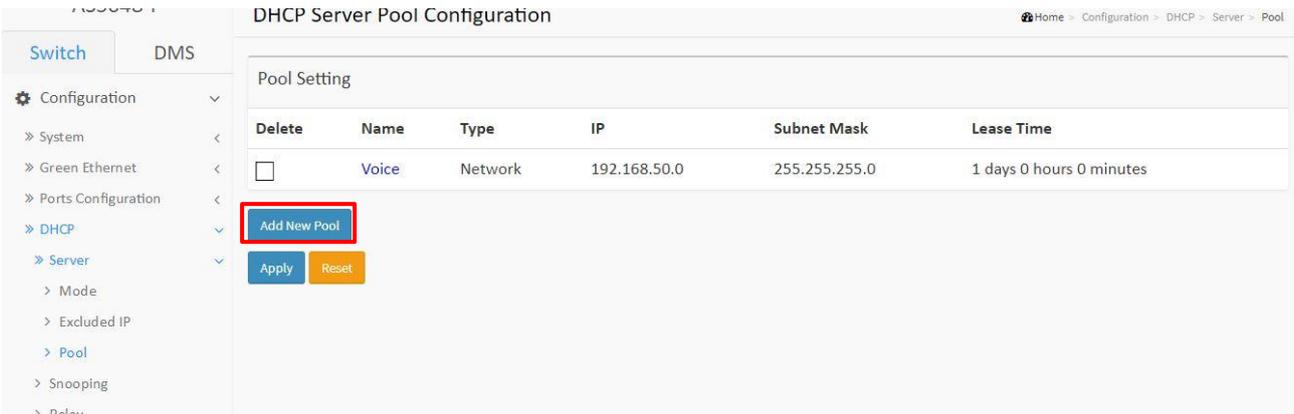
The screenshot shows the configuration page for a DHCP server. The breadcrumb trail is: Home > Configuration > DHCP > Server > Excluded IP. The page title is "DHCP Server Excluded IP Configuration". On the left, there is a navigation menu with "Switch" and "DMS" tabs. Under "Configuration", the "DHCP" section is expanded, and "Server" is selected. The "Excluded IP" sub-section is also expanded. The main content area has a table titled "Excluded IP Address" with two columns: "Delete" and "IP Range". The "Delete" column contains a checkbox, and the "IP Range" column contains the text "192.168.50.1 - 192.168.50.100". Below the table, there is a red-bordered button labeled "Add IP Range", and two buttons labeled "Apply" and "Reset".

Delete	IP Range
<input type="checkbox"/>	192.168.50.1 - 192.168.50.100

11. DHCP Server Pool Configuration

We finally add the DHCP Server Pool.

- **Configuration** → **DHCP** → **Server** → **Pool**
- Choose **Add New Pool**
- Enter **the desired Pool name** you want to use (e.g. *Voice*)
- **Apply**

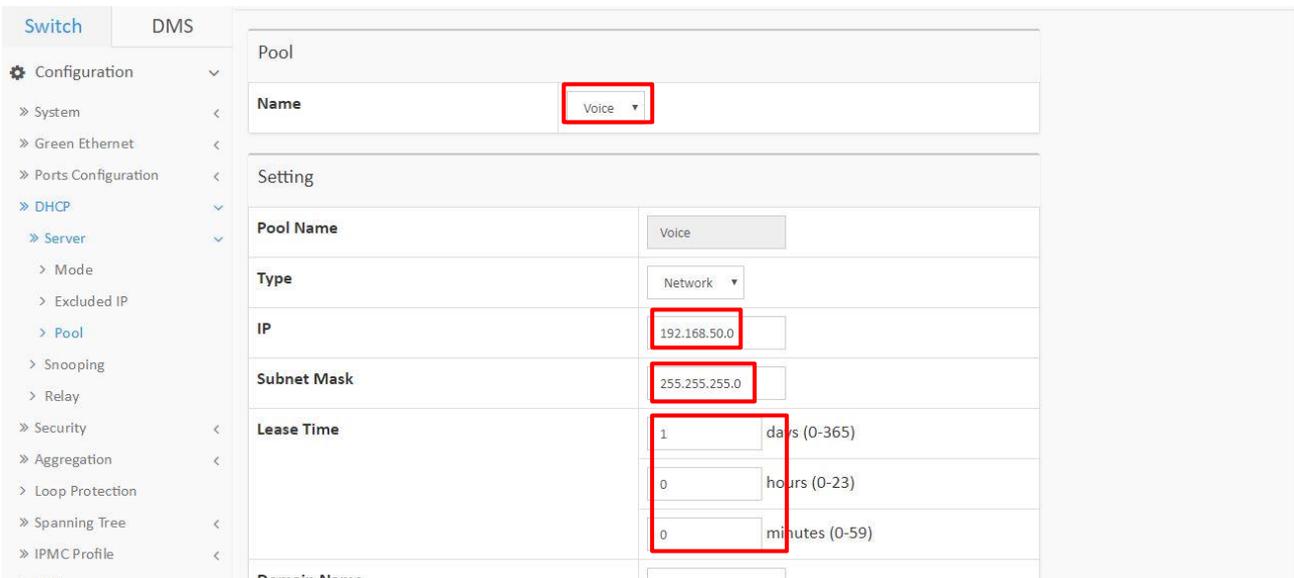


The screenshot shows the 'DHCP Server Pool Configuration' page. On the left, a navigation menu is visible with 'DHCP' and 'Server' expanded, and 'Pool' selected. The main area contains a table with the following data:

Delete	Name	Type	IP	Subnet Mask	Lease Time
<input type="checkbox"/>	Voice	Network	192.168.50.0	255.255.255.0	1 days 0 hours 0 minutes

Below the table, there are two buttons: 'Add New Pool' (highlighted with a red box) and 'Apply'.

- Then click on the **Pool name** and configure the DHCP range
- **Pool Name** → *Voice*
- **Type** → *Network*
- **IP** → *IP address* (e.g. *19.168.50.0*)
- **Subnetmask** → *required mask* (e.g. *255.255.255.0*)
- **Lease time** → *length of the IP lease* (e.g. *1 day*)
- **Apply**



The screenshot shows the configuration form for the 'Voice' pool. The fields are as follows:

- Name:** Voice (highlighted with a red box)
- Type:** Network
- IP:** 192.168.50.0 (highlighted with a red box)
- Subnet Mask:** 255.255.255.0 (highlighted with a red box)
- Lease Time:** 1 days (0-365), 0 hours (0-23), 0 minutes (0-59) (highlighted with a red box)

12. Port VLAN Configuration

Now the Ports that are going to use the VLAN have to be configured with the required VLANs.

- **Configuration → VLANs**
- On the Port you want to have the Voice VLAN on change → **Mode → Hybrid**
- Enter **the VLANs you want to use (e.g. 1,50 or 1-10,50)** in **Allowed VLANs**
- **Apply**

Port VLAN Configuration									
Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs	
*	<>	1	<>	<input type="checkbox"/>	<>	<>	1,50		
1	Hybrid	1	C-Port	<input type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1,50		
2	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1		
3	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1		
4	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1		
5	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1		

13. Check via MAC Table and Neighbour cache

On the switch we will now check if the attached Yealink phone receives the correct VLAN on configured port. We plug the phone into the switch and wait until it has booted.

- Switch web-interface → **Monitor** → **MAC** Table look for the Yealink MAC and check Port and VLAN

Type	VLAN	MAC Address	Port Members																			
			CPU	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Dynamic	1	00-0B-82-9B-C5-8E			✓																	
Dynamic	1	00-0B-82-B8-4B-1B																				
Static	1	33-33-00-00-00-01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Static	1	33-33-00-00-00-02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Static	1	33-33-FF-00-DD-61	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dynamic	1	50-E5-49-C5-D5-6E																				
Static	1	FF-FF-FF-FF-FF-FF	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dynamic	50	00-0B-82-B8-4B-1B																				
Static	50	00-15-65-47-65-0D		✓																		
Static	50	33-33-00-00-00-01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Static	50	33-33-00-00-00-02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Under → **Monitor** → **System** → **IP status** the Neighbour cache can be checked.

Neighbour cache	
IP Address	Link Address
192.168.1.1	VLAN1:00-0b-82-b8-4b-1b
192.168.1.2	VLAN1:00-00-8c-00-dd-61
192.168.1.3	VLAN1:50-e5-49-c5-d5-6e
192.168.1.200	VLAN1:00-0b-82-9b-c5-8e
192.168.50.2	VLAN50:00-0b-82-b8-4b-1b
192.168.50.101	VLAN50:00-15-65-47-65-0d
fe80::200:8cff:fe00:dd61	VLAN1:00-00-8c-00-dd-61
fe80::200:8cff:fe00:dd61	VLAN50:00-00-8c-00-dd-61

We can see that the device automatically gets the Voice VLAN 50 assigned via dhcp from the Switch and communication with the router is working. The phone doesn't have to be prepared for Voice VLAN specifically!