1 PREFACE

This deployment guide demonstrates how to configure D-Link's Voice VLAN features.

In this guide, we will simulate typical network architectures – including core, aggregation and access-layer switches. In this guide, the core switches run VRRP for redundancy purposes and each switch in the aggregation and access layer configures two VLANs to separate data and voice traffic.

We will give step-by-step demonstrations of the configuration methods for CLI – complete with descriptions to explain the purpose of each command, so that readers can fully understand the "how and why" of these commands.

This guide does not give detailed explanations of Voice VLAN features. Such details can be found in each model's User Guide, Web UI Reference Guide, or CLI Reference Guide.

In this guide, CLI command lines will be represented in *italic font*.

* NOTE: Currently, D-Link's Voice VLAN feature has two behavior types that are described in the table below. The restrictions described in this table will be removed in future releases – the "Untagged / Tagged Type" behaviors will be configurable on the switch in a future firmware release.

Models	Untagged / Tagged Type	
	Client Port (connects to IP Phone)	IP Phones
All managed switches (except DGS-3100 Series & Smart Switch)	Untagged port member of Voice VLAN	Must support untagged packet type
DGS-3100 Series & Smart Switch	Tagged port member of Voice VLAN	Must support tagged packet type

2 NETWORK TOPOLOGY

The network topology simulated in this guide features two geographic areas, two data VLANs and two voice VLANs.

The VLAN information:

VLAN Type	VLAN ID	VLAN Name
Data	10	V1
	11	V2
Voice	20	Voice1
	21	Voice2

* In this guide we assume that the user wishes to build a high-availability network in which the traffic for data and voice can be separated. It is assumed that any lag in the voice stream is not allowable.

In D-Link's Voice VLAN design, voice traffic is given a higher priority in the 802.1p Priority Queue. 802.1p is a field in the VLAN header, which is a Layer 2 variable. This implies that an 802.1p tag would

usually not be carried over a Layer 3 network. However, D-Link's DGS-3600 Layer 3 switches can be configured to leave the 802.1p tags in place when such traffic passes through its L3 routing. If your network is not using a DGS-3600 as its L3 router or switch, test if the existing L3 device can leave 802.1p tags in place when such traffic passes through its L3 routing. If not, you should configure the L3 device to map all 802.1p information to DSCP. DSCP is an L3 priority tag and can be carried over L3 networks.

In this guide, two L3 switches (DGS-3650 and DGS-3612) are configured to support VRRP and also to create separate Data VLANs and Voice VLANs to separate these two types of traffic.

In the diagram below, the DGS-3627G device acts as a WAN router.

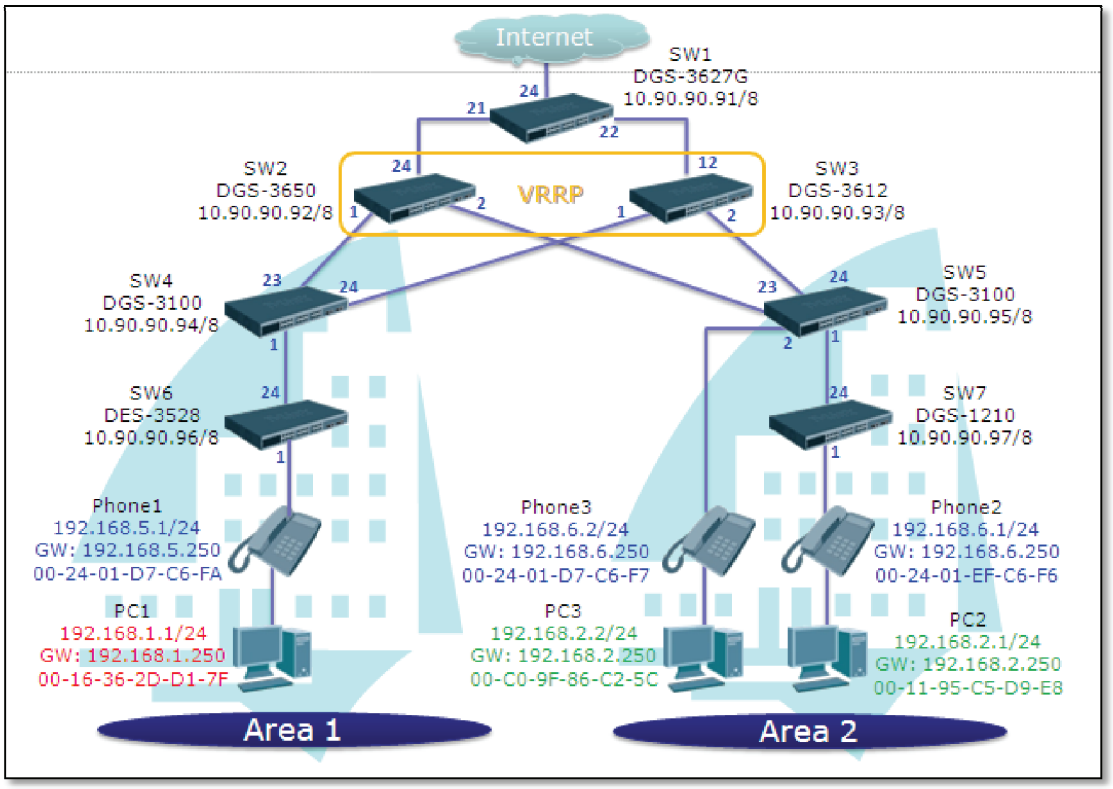

Figure 1: Network Topology

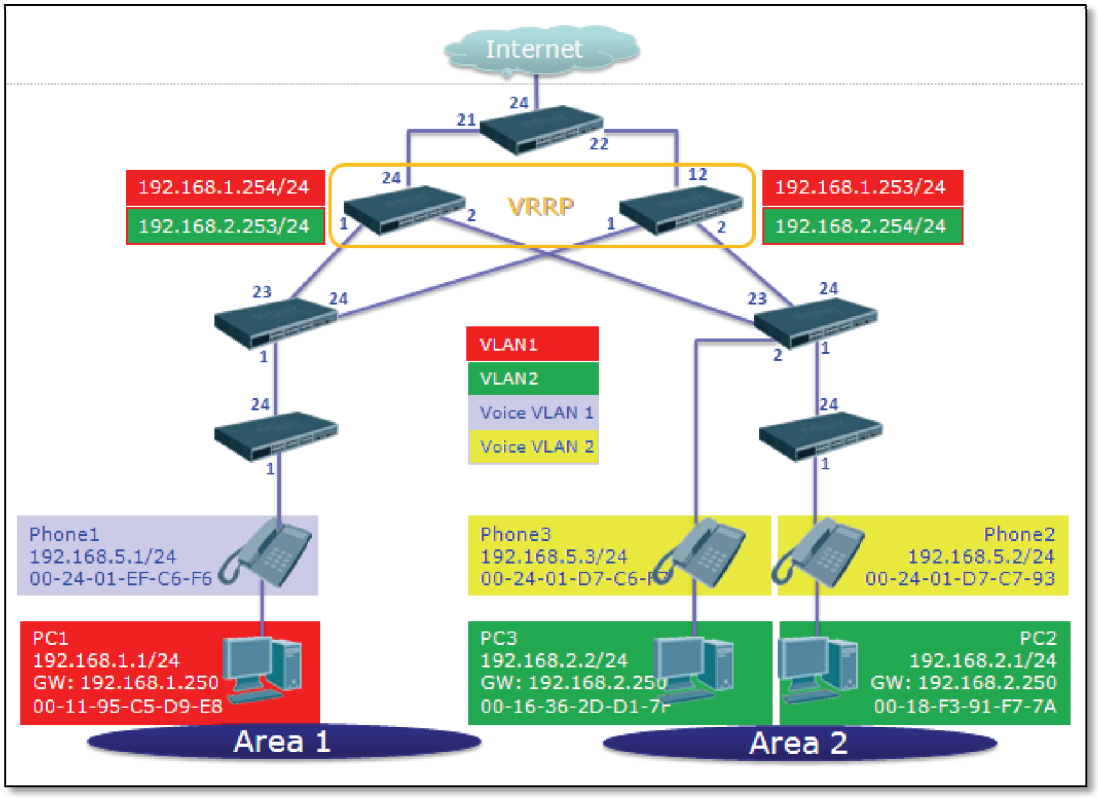

Figure 2: VLAN Topology

3 CONFIGURATION EXAMPLE

3.1 CONFIGURE DGS-3650 (SW2)

Step 1: Create separate VLANs for data and voice traffic and assign ports to each VLAN.

Syntax:

- **create vlan** <vlan_name 32> {tag <vlanid 2-4094> | type 1q_vlan | advertisement}
- **config vlan** <vlan_name 32> {[add [tagged | untagged | forbidden] | delete] <portlist> | advertisement [enable | disable]}

Command example:

create vlan v3 tag 30	(create a VLAN named “v3” with VLAN ID “30”)
config vlan v3 add tagged 24	(assign port 24 to VLAN “v3” as a tagged port)
create vlan v1 tag 10	(create a VLAN named “v1” with VLAN ID “10”)
config vlan v1 add tagged 1	(assign port 1 to VLAN “v1” as a tagged port)
create vlan v2 tag 11	(create a VLAN named “v2” with VLAN ID “11”)
config vlan v2 add tagged 2	(assign port 2 to VLAN “v2” as a tagged port)
create vlan Voice1 tag 20	(create a VLAN named “Voice1” with VLAN ID “20”)
config vlan Voice1 add tagged 1	(assign port 1 to VLAN “Voice1” as a tagged port)

create vlan Voice2 tag 21	(create a VLAN named “Voice2” with VLAN ID “21”)
config vlan Voice2 add tagged 2	(assign port 2 to VLAN “Voice2” as a tagged port)

Step 2: Create an L3 IP interface for each VLAN to enable routing.

Syntax:

- **config ipif** <ipif_name 12> [{ ipaddress <network_address> | vlan <vlan_name 32> | state [enable|disable] | proxy_arp [enable|disable] {local [enable|disable]}}| bootp | dhcp | ipv6 ipv6address <ipv6networkaddr> | ip_mtu <value 512-1712> | dhcpv6_client [enable | disable] | ip_directed_broadcast [enable | disable]]

Command example:

config ipif System ipaddress 10.90.90.92/8	(assign the management IP address)
create ipif v3 192.168.99.5/30 v3	(assign IP address for “v3” VLAN)
create ipif v1 192.168.1.254/24 v1	(assign IP address for “v1” VLAN)
create ipif v2 192.168.2.253/24 v2	(assign IP address for “v2” VLAN)
create ipif Voice1 192.168.5.254/24 Voice1	(assign IP address for “Voice1” VLAN)
create ipif Voice2 192.168.6.253/24 Voice2	(assign IP address for “Voice2” VLAN)

Step 3: Enable spanning tree protocol.

Syntax:

- **enable stp**

Command example:

enable stp	(enable spanning tree globally)

Step 4: Configure the default gateway.

Syntax:

- **create iproute** [default | <network_address>] [null0 | <ipaddr> {<metric 1-65535>} {[primary | backup | weight <value 1-4>]}]

Command example:

create iproute default 192.168.99.6	(configure 192.168.99.6 as the default gateway)

Step 5: Configure the VRRP function.

Syntax:

- **create vrrp vrid** <vrid 1-255> ipif <ipif_name 12> ipaddress <ipaddr> {state [enable | disable] | priority <int 1-254> | advertisement_interval <int 1-255> | preempt [true | false] | critical_ip <ipaddr> | critical_ip_state [enable | disable]}

Command example:

create vrrp vrid 1 ipif v1 ipaddress 192.168.1.250 state enable

(Create a virtual IP to be the default gateway for the 192.168.1.0 subnet)

create vrrp vrid 2 ipif v2 ipaddress 192.168.2.250 state enable

(Create a virtual IP to be the default gateway for the 192.168.2.0 subnet)

create vrrp vrid 3 ipif Voice1 ipaddress 192.168.5.250 state enable

(Create a virtual IP to be the default gateway for the 192.168.5.0 subnet)

create vrrp vrid 4 ipif Voice2 ipaddress 192.168.6.250 state enable

(Create a virtual IP to be the default gateway for the 192.168.6.0 subnet)

Step 6: Enable the VRRP function.

Syntax:

- **enable vrrp** {ping}

Command example:

enable vrrp (enable the switch's VRRP function)

enable vrrp ping (the "ping" parameter will allow the virtual IP to be pinged by the client for troubleshooting any connectivity problems)

```
create vlan v3 tag 30
config vlan v3 add tagged 24
create vlan v1 tag 10
config vlan v1 add tagged 1
create vlan v2 tag 11
config vlan v2 add tagged 2
create vlan Voice1 tag 20
config vlan Voice1 add tagged 1
create vlan Voice2 tag 21
config vlan Voice2 add tagged 2

config ipif System ipaddress 10.90.90.92/8
create ipif v3 192.168.99.5/30 v3
create ipif v1 192.168.1.254/24 v1
create ipif v2 192.168.2.253/24 v2
create ipif Voice1 192.16a8.5.254/24 Voice1
create ipif Voice2 192.168.6.253/24 Voice2

enable stp

create iproute default 192.168.99.6

create vrrp vrid 1 ipif v1 ipaddress 192.168.1.250 state enable
create vrrp vrid 2 ipif v2 ipaddress 192.168.2.250 state enable
create vrrp vrid 3 ipif Voice1 ipaddress 192.168.5.250 state enable
create vrrp vrid 4 ipif Voice2 ipaddress 192.168.6.250 state enable
enable vrrp
enable vrrp ping
```

Figure 3: DGS-3650 Command Line Summary

3.2 CONFIGURE DGS-3612 (SW3)

Step 1: Create separate VLANs for data and voice traffic and assign ports to each VLAN.

Syntax:

- **create vlan** <vlan_name 32> {tag <vlanid 2-4094> | type 1q_vlan | advertisement}
- **config vlan** <vlan_name 32> {[add [tagged | untagged | forbidden] | delete] <portlist> | advertisement [enable | disable]}

Command example:

create vlan v4 tag 40	(create a VLAN named "v4" with VLAN ID "40")
config vlan v4 add tagged 12	(assign port 12 to VLAN "v4" as a tagged port)
create vlan v1 tag 10	(create a VLAN named "v1" with VLAN ID "10")
config vlan v1 add tagged 1	(assign port 1 to VLAN "v1" as a tagged port)
create vlan v2 tag 11	(create a VLAN named "v2" with VLAN ID "11")
config vlan v2 add tagged 2	(assign port 2 to VLAN "v2" as a tagged port)
create vlan Voice1 tag 20	(create a VLAN named "Voice1" with VLAN ID "20")
config vlan Voice1 add tagged 1	(assign port 1 to VLAN "Voice1" as a tagged port)
create vlan Voice2 tag 21	(create a VLAN named "Voice2" with VLAN ID "21")
config vlan Voice2 add tagged 2	(assign port 2 to VLAN "Voice2" as a tagged port)

Step 2: Create an L3 IP interface for each VLAN to enable routing.

Syntax:

- **config ipif** <ipif_name 12> [{ ipaddress <network_address> | vlan <vlan_name 32> | state [enable|disable] | proxy_arp [enable|disable] {local [enable|disable]}}| bootp | dhcp | ipv6 ipv6address <ipv6networkaddr> | ip_mtu <value 512-1712> | dhcpv6_client [enable | disable] | ip_directed_broadcast [enable | disable]]

Command example:

config ipif System ipaddress 10.90.90.93/8	(assign the management IP address)
create ipif v4 192.168.99.9/30 v4	(assign IP address for "v4" VLAN)
create ipif v1 192.168.1.253/24 v1	(assign IP address for "v1" VLAN)
create ipif v2 192.168.2.254/24 v2	(assign IP address for "v2" VLAN)
create ipif Voice1 192.168.5.253/24 Voice1	(assign IP address for "Voice1" VLAN)
create ipif Voice2 192.168.6.254/24 Voice2	(assign IP address for "Voice2" VLAN)

Step 3: Enable spanning tree protocol.

Syntax:

- **enable stp**

Command example:

enable stp (enable spanning tree globally)

Step 4: Configure the default VLAN.

Syntax:

- **create iproute** [default | <network_address>] [null0 | <ipaddr> {<metric 1-65535>} {[primary | backup | weight <value 1-4>]}]

Command example:

create iproute default 192.168.99.10 (configure 192.168.99.10 as the default gateway)

Step 5: Configure the switch's VRRP feature.

Syntax:

- **create vrrp vrid** <vrid 1-255> ipif <ipif_name 12> ipaddress <ipaddr> {state [enable | disable] | priority <int 1-254> | advertisement_interval <int 1-255> | preempt [true | false] | critical_ip <ipaddr> | critical_ip_state [enable | disable]}

Command example:

create vrrp vrid 1 ipif v1 ipaddress 192.168.1.250 state enable

(create a virtual IP to be the default gateway for the 192.168.1.0 subnet)

create vrrp vrid 2 ipif v2 ipaddress 192.168.2.250 state enable

(create a virtual IP to be the default gateway for the 192.168.2.0 subnet)

create vrrp vrid 3 ipif Voice1 ipaddress 192.168.5.250 state enable

(create a virtual IP to be the default gateway for the 192.168.5.0 subnet)

create vrrp vrid 4 ipif Voice2 ipaddress 192.168.6.250 state enable

(create a virtual IP to be the default gateway for the 192.168.6.0 subnet)

Step 6: Enable the VRRP feature.

Syntax:

- **enable vrrp** {ping}

Command example:

enable vrrp (enable the switch's VRRP function)

enable vrrp ping (the "ping" parameter will allow the virtual IP to be pinged by the client for troubleshooting any connectivity problems)

```
create vlan v4 tag 40
config vlan v4 add tagged 12
create vlan v1 tag 10
config vlan v1 add tagged 1
create vlan v2 tag 11
config vlan v2 add tagged 2
create vlan Voice1 tag 20
config vlan Voice1 add tagged 1
create vlan Voice2 tag 21
config vlan Voice2 add tagged 2

config ipif System ipaddress 10.90.90.93/8
create ipif v4 192.168.99.9/30 v4
create ipif v1 192.168.1.253/24 v1
create ipif v2 192.168.2.254/24 v2
create ipif Voice1 192.168.5.253/24 Voice1
create ipif Voice2 192.168.6.254/24 Voice2

enable stp

create iproute default 192.168.99.10

create vrrp vrid 1 ipif v1 ipaddress 192.168.1.250 state enable
create vrrp vrid 2 ipif v2 ipaddress 192.168.2.250 state enable
create vrrp vrid 3 ipif Voice1 ipaddress 192.168.5.250 state enable
create vrrp vrid 4 ipif Voice2 ipaddress 192.168.6.250 state enable
enable vrrp
enable vrrp ping
```

Figure 4: DGS-3612 Command Line Summary

3.3 CONFIGURE DGS-3100 (SW4)

Step 1: Create VLANs for data and voice traffic and assign ports to each VLAN.

Syntax:

- **create vlan** <vlan_name 32> {tag <vlanid 2-4094>}
- **config vlan** vlanid <vlanid 1-4094> [[add [tagged | untagged | forbidden] | delete] [<portlist> | <ch1-32>] | vlan_name <vlan_name 32>]

Command example:

create vlan v1 tag 10	(create a VLAN named “v1” with VLAN ID “10”)
config vlan v1 add tagged 1,23,24	(assign ports 1, 23 & 24 to VLAN “v1” as tagged ports)
create vlan Voice1 tag 20	(create a VLAN named “Voice1” with VLAN ID “20”)
config vlan Voice1 add tagged 1,23,24	(assign ports 1, 23 & 24 to VLAN “Voice1” as tagged ports)

Step 2: Configure the switch's management IP.

Syntax:

- **config ipif system** [{ipaddress <network_address> | vlan <vlan_name 32> | state [enable | disable]} | dhcp] {dhcp | vlan <vlan_name 32>}]

Command example:

config ipif System ipaddress 10.90.90.94/8 (configure switch's management IP address)

Step 3: Enable spanning tree protocol.

When enabling STP in the DGS-3100, RSTP will not be enabled by default. For the DGS-3600 series and the DES-3528/52 series, when STP is enabled, RSTP will be enabled by default. To deliver maximum performance, the DGS-3100 should be configured to enable RSTP.

Syntax:

- **config stp version** [mstp | rstp | stp]
- **enable STP**

Command example:

config stp version rstp (configure DGS-3100 to run RSTP)

enable stp (enable spanning tree globally)

```
create vlan v1 tag 10
config vlan v1 add tagged 1,23,24
create vlan Voice1 tag 20
config vlan Voice1 add tagged 1,23,24

config ipif System ipaddress 10.90.90.94/8

config stp version rstp
enable stp
```

Figure 5: DGS-3100 Command Line Summary

3.4 CONFIGURE DGS-3100 (SW5)

Step 1: Create VLANs for data and voice traffic and assign ports to each VLAN.

Syntax:

- **create vlan** <vlan_name 32> {tag <vlanid 2-4094>}
- **config vlan** vlanid <vlanid 1-4094> [[add [tagged | untagged | forbidden] | delete] [<portlist> | <ch1-32>] | vlan_name <vlan_name 32>]

Command example:

create vlan v2 tag 11	(create a VLAN named "v2" with VLAN ID "11")
config vlan v2 add tagged 1,23,24	(assign ports 1, 23 & 24 to VLAN "v2" as tagged ports)
config vlan v2 add untagged 2	(assign port 2 to VLAN "v2" as an untagged port)
create vlan Voice2 tag 21	(create a VLAN named "Voice2" with VLAN ID "20")
config vlan Voice2 add tagged 1,23,24	(assign ports 1, 23 & 24 to VLAN "Voice2" as tagged ports)

Step 2: Configure the switch's management IP.

Syntax:

- **config ipif system** [{ipaddress <network_address> | vlan <vlan_name 32> | state [enable | disable]} | dhcp] {dhcp | vlan <vlan_name 32>}]

Command example:

config ipif System ipaddress 10.90.90.95/8	(configure switch's management IP address)

Step 3: Enable spanning tree protocol.

When enabling STP in the DGS-3100, RSTP will not be enabled by default. For the DGS-3600 series and the DES-3528/52 series, when STP is enabled, RSTP will be enabled by default. To deliver maximum performance, the DGS-3100 should be configured to enable RSTP.

Syntax:

- **config stp version** [mstp | rstp | stp]
- **enable STP**

Command example:

config stp version rstp	(configure DGS-3100 to run RSTP)
enable stp	(enable STP function)

Step 4: Configure the Voice VLAN feature.

Syntax:

- **config voice_vlan** [enable [<vlan_name 32> | vlanid <vlanid 1-4094>] | disable] | oui-table [add <mac-address-prefix> description <string 32> | delete <mac-address-prefix>] | [add <portlist> {mode secure} | delete <portlist>] | cos <0-7> {remark} |aging_time <1-43200>

Command example:

config voice_vlan enable Voice	(enable Voice VLAN feature)
config voice_vlan add 2	(assign port 2 to join Voice VLAN)
config voice_vlan oui-table add 002401 description D-Link	(configure D-Link Phone's OUI into switch's OUI table)
config voice_vlan cos 6	(assign priority to Voice VLAN)

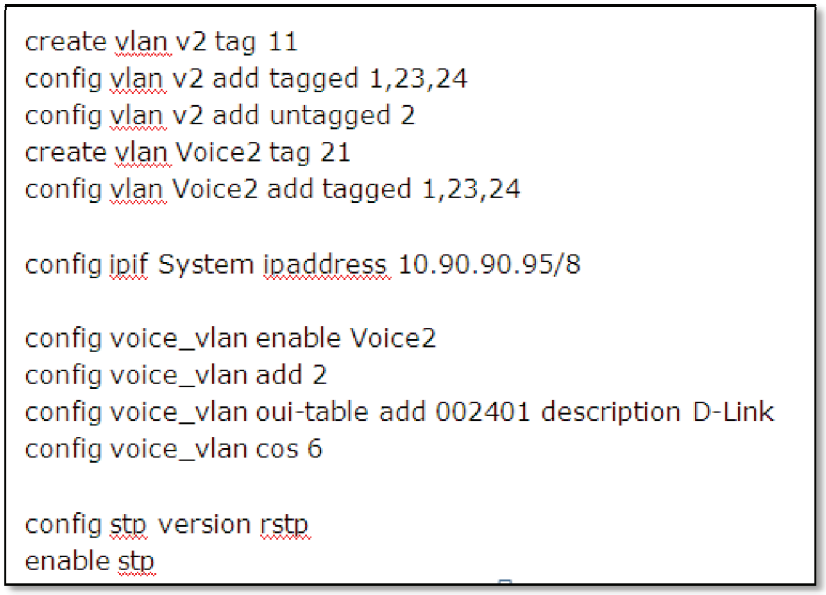

Figure 6: DGS-3100 Command Line Summary

3.5 CONFIGURE DES-3528 (SW6)

Step 1: Create VLANs for data and voice traffic and assign ports to each VLAN.

Syntax:

- **create vlan** < vlan_name 32> tag <vlanid 2-4094> {type 1q_vlan advertisement}
- **config vlan** <vlan_name 32> {[add [tagged | untagged | forbidden] | delete] <portlist> | advertisement [enable | disable]}(1)

Command example:

config vlan default delete 1	(remove port 1 from default VLAN)
create vlan v1 tag 10	(create a VLAN named “v1” with VLAN ID “10”)
config vlan v1 add tagged 24	(assign port 24 to VLAN “v1” as a tagged port)
config vlan v1 add untagged 1	(assign port 1 to VLAN “v1” as an untagged port)
create vlan Voice1 tag 20	(create a VLAN named “Voice1” with VLAN ID “20”)
config vlan Voice1 add tagged 24	(assign port 24 to VLAN “Voice1” as a tagged port)

Step 2: Configure the switch’s management IP.

Syntax:

- **config ipif** <ipif_name 12> [{ipaddress <network_address> | vlan <vlan_name 32> | proxy_arp [enable | disable] {local [enable | disable]} | state [enable | disable]} | bootp | dhcp | ipv6 [ipv6address <ipv6networkaddr> | state [enable | disable]] | ipv4 state [enable | disable] | dhcpv6_client [enable | disable]]

Command example:

config ipif System ipaddress 10.90.90.96/8	(configure switch’s management IP address)

Step 3: Enable spanning tree protocol.

Syntax:

- **enable stp**

Command example:

enable stp (enable spanning tree globally)

Step 4: Configure Voice VLAN features.

Syntax:

- **enable voice_vlan** [<vlan_name 32> | vlanid <vlanid 1-4094>]
- **config voice_vlan ports** [<portlist> | all] [state [enable | disable] | mode [auto | manual]]
- **config voice_vlan oui** [add | delete] <macaddr> < macmask> {description <desc 32>}
- **config voice_vlan priority** <int 0-7>

Command example:

enable voice_vlan Voice1 (specify that VLAN named "Voice" is a Voice VLAN)

config voice_vlan ports 1 state enable (enable Voice VLAN function on port 1)

config voice_vlan oui add 00-24-01-00-00-00 FF-FF-FF-00-00-00 description D-Link
(configure D-Link Phone's OUI into switch's OUI table)

config voice_vlan priority 6 (assign priority to Voice VLAN)

```
config vlan default delete 1
create vlan v1 tag 10
config vlan v1 add tagged 24
config vlan v1 add untagged 1
create vlan Voice1 tag 20
config vlan Voice1 add tagged 24

config ipif System ipaddress 10.90.90.96/8

enable voice_vlan Voice1
config voice_vlan ports 1 state enable
config voice_vlan oui add 00-24-01-00-00-00 FF-FF-FF-00-00-00 description D-Link
config voice_vlan priority 6

enable stp
```

Figure 7: DES-3528 Command Line Summary

3.6 CONFIGURE DGS-1210 (SW7)

The DGS-1210 only supports configuration through a Web-based GUI. Therefore, all the configuration steps will be shown in Web UI format.

Step 1: Configure the IP address.

By default, the management IP of DGS-1210 is 10.90.90.90. To configure a new management IP, users have to browse to http://10.90.90.90, then open the Web UI and then click *System > System Settings* in the left-hand panel to configure a new management IP address.

The IP address for DGS-1210 in our example is 10.90.90.97 with 255.0.0.0 for the subnet mask.

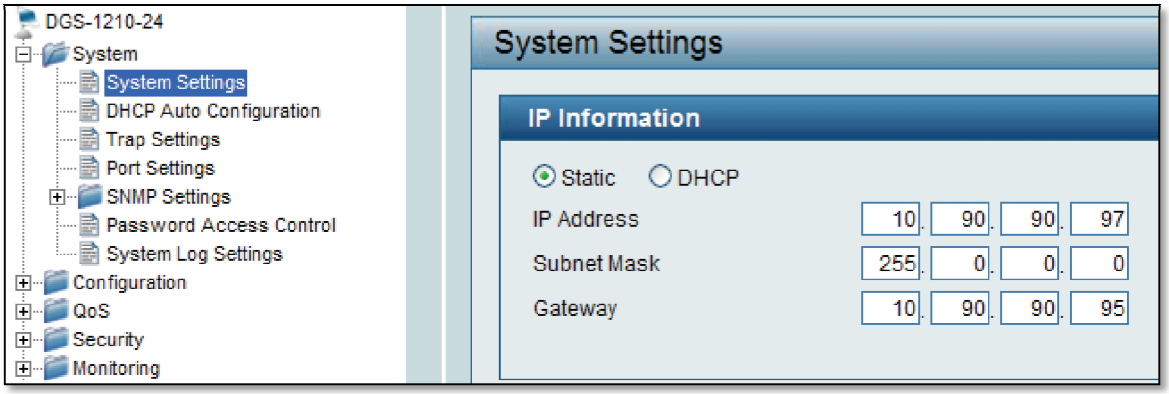

Figure 8: DGS-1210 System Settings Page

Step 2: Enable RSTP.

Open the Web UI with new IP address, http://10.90.90.97, and then click *Configuration > Spanning Tree > STP Global Settings* to open the STP Global Settings page.

In this page, check "Enabled" for RSTP Status and "RSTP" for STP Version item. Click "Apply" after completing the procedure.

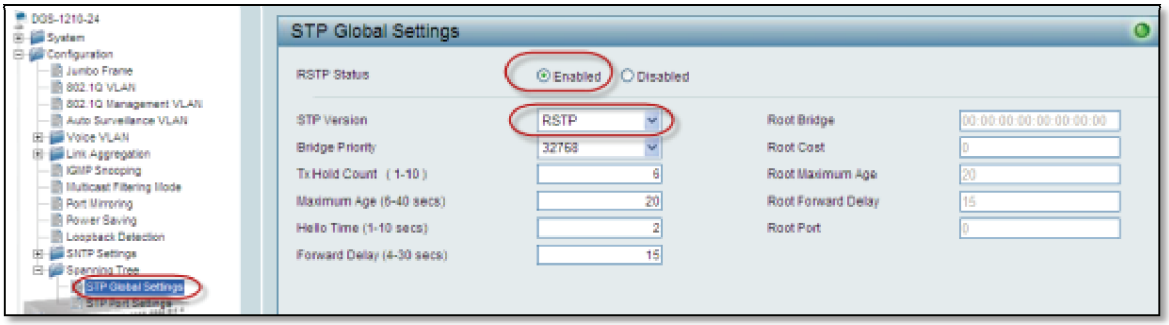

Figure 9: DGS-1210 STP Global Settings Page

Step 3: Create separate VLANs for data and voice traffic and assign ports to each VLAN.

Click on *Configuration > 802.1Q VLAN* in the left-hand panel to display the IEEE 802.1Q VLAN Configuration page.

On this page (below), click on the "1" which is in the VID column to edit VLAN memberships for VID 1.

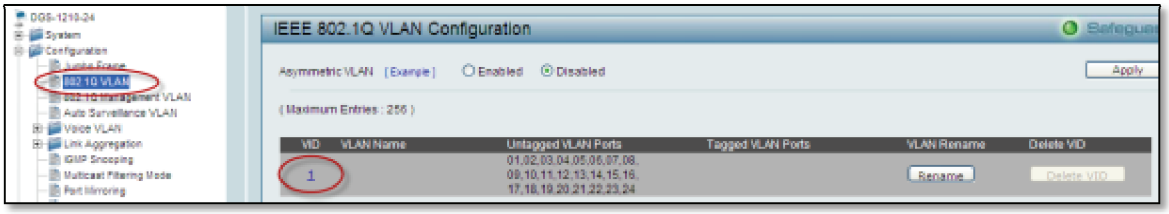

Figure 10: DGS-1210 IEEE 802.1Q VLAN Configuration Page

On this VID Configuration page (VID 1), check “Not Member” on port 1 and click “Apply” to go back to the IEEE 802.1Q VLAN Configuration Page.

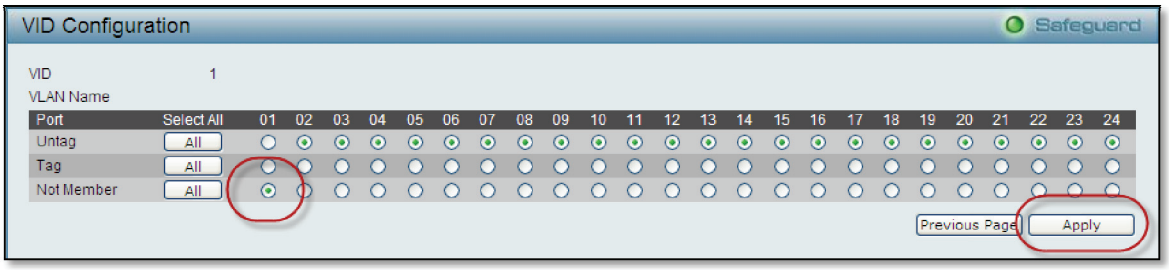

Figure 11: Edit VLAN 1 Member Port Page

Click the “Add VID” button at the bottom right of the page to create VLAN 11.

Figure 12: Create New VLAN

Please follow the steps below to create VLAN 11 and assign member ports. (See Figure 13 below.)

1. Input “11” in the VID field.
2. Input “v2” in the VLAN Name field.
3. Select “Untagged” on port 01 and “Tagged” on port 24.
4. Click “Apply” to save the settings.

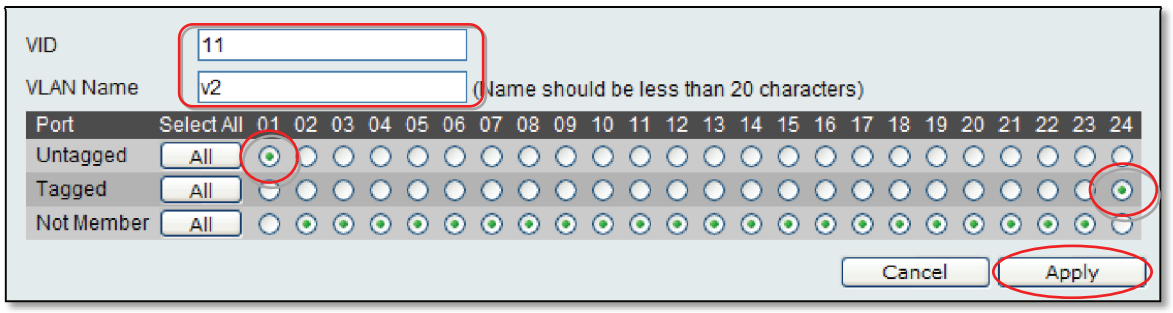

Figure 13: Assign VLAN ID, VLAN Name and Member Ports for VLAN 11

Click “Add VID” button (Figure 12) to create VLAN 21.

Please follow the steps below to create VLAN 21 and assign member ports.

1. Input “21” in the VID column.
2. Input “Voice2” in the VLAN Name column.
3. Select “Tagged” on port 24.
4. Click “Apply” to save the settings.

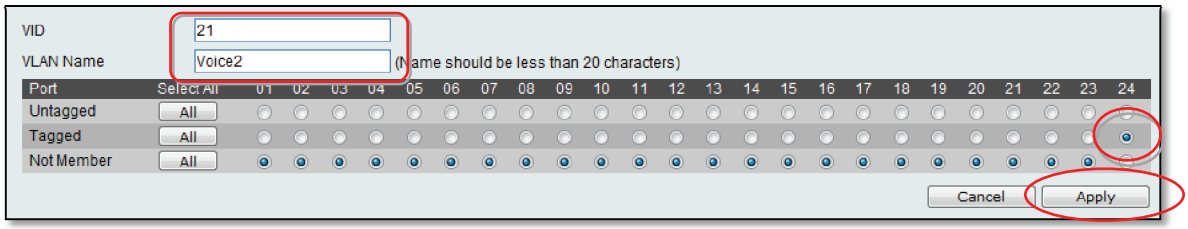

Figure 14: Assign VLAN ID, VLAN Name and Member Ports for VLAN 21

Step 4: Configure Voice VLAN settings.

Click on *Configuration > Voice VLAN > Voice VLAN Settings* in the left-hand panel to display the Voice VLAN Settings page.

Please follow the steps below to configure VLAN 21.

1. Click “Enabled” next to Voice VLAN.
2. Select “21” next to Vlan ID.
3. Select “Highest” next to Priority. “Highest” means a CoS of 6.
4. Click “Apply” to complete the setting.

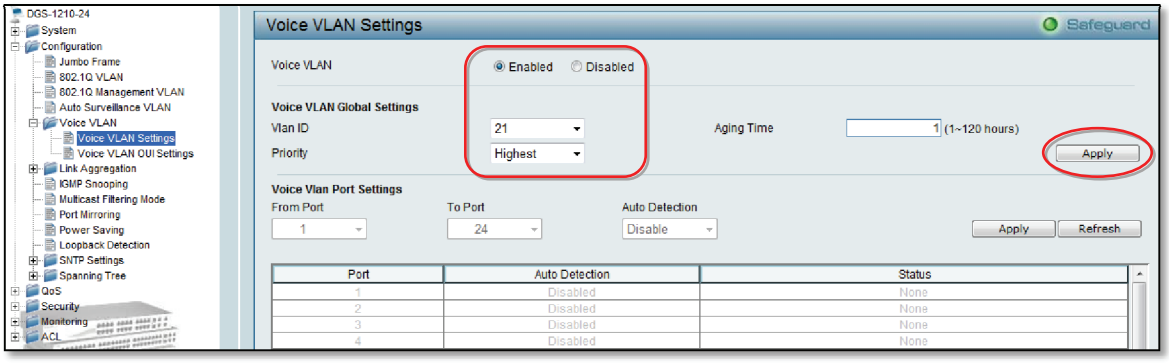

Figure 15: Configure Voice VLAN

5. When the user clicks “Apply”, the GUI will activate the “Voice VLAN Port Settings” field at the bottom. Select port 1 to enable Auto Detection and then click “Apply”.

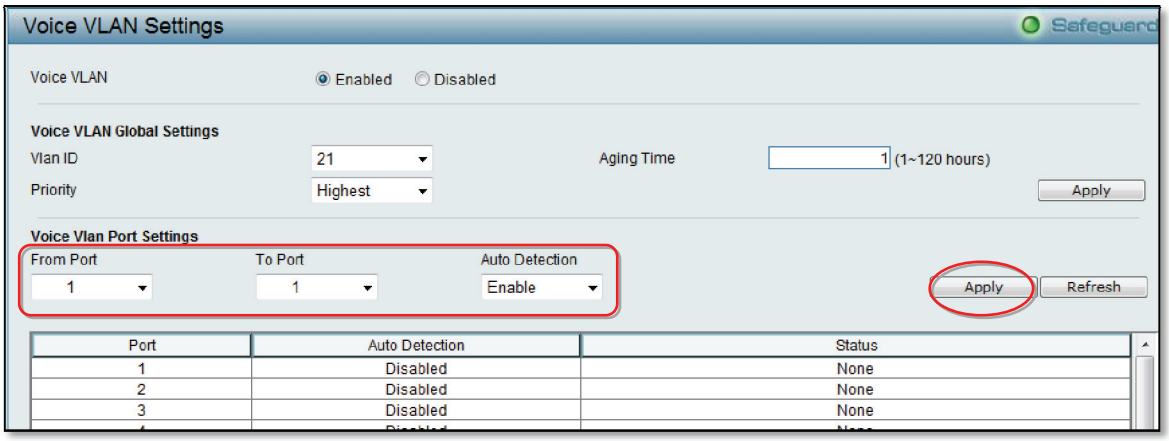

Figure 16: Enable Auto Detection for Voice VLAN Port

Step 5: Configure the Voice VLAN OUI function.

Click on *Configuration > Voice VLAN > Voice VLAN OUI Settings* in the left-hand panel to display the Voice VLAN OUI Settings page.

Please follow the steps below to configure Voice VLAN OUI.

1. Select “User defined OUI”.
2. Input “D-Link” in the lower Description field.
3. Input the phone’s OUI in Telephony OUI field.
4. Click “Add” to save the settings.

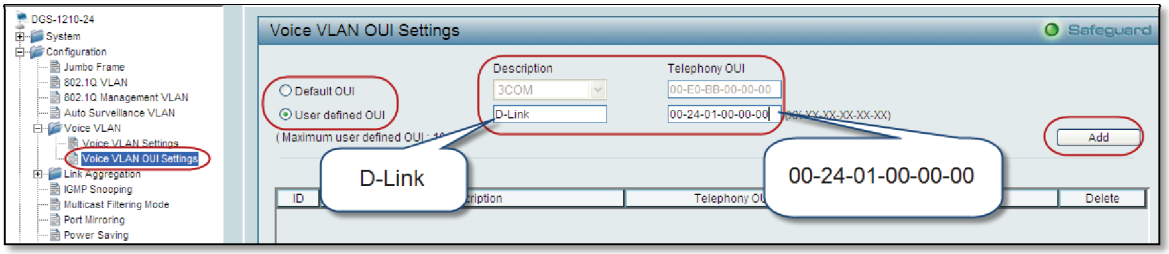

Figure 17: Configure Telephony OUI

4 VERIFICATION

With this configuration, phone 1 should be able to call phone 2 without any interruptions in data traffic.

4.1 DATA TRAFFIC VERIFICATION:

PC2 (192.168.2.1) PINGs PC1 (192.168.1.1)

In the captured packet (printout below), we can see that data traffic moves correctly within VLAN ID 11 (VID 11) and we can see that no priority is assigned to the VLAN.

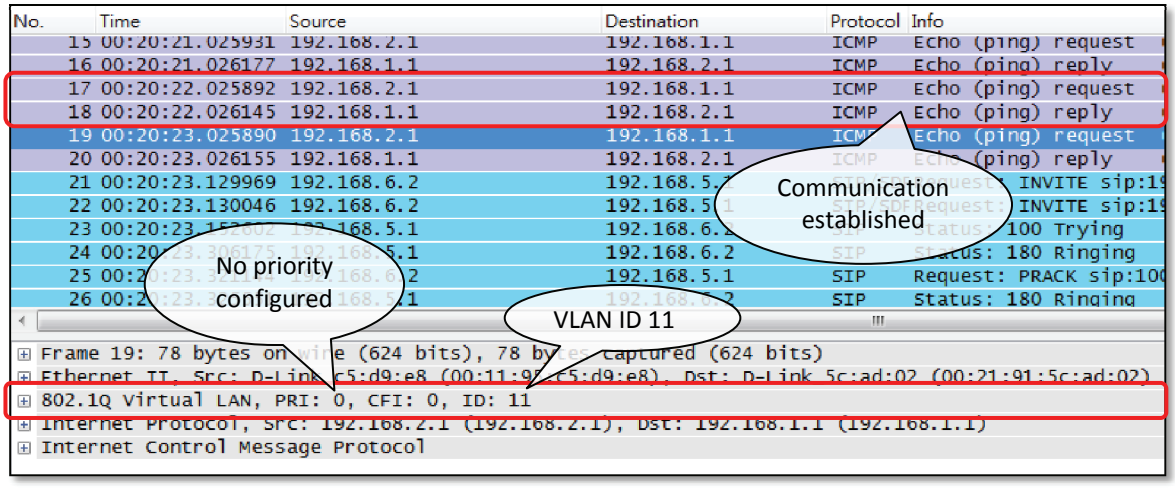

Figure 18: Packet Analysis of Data Traffic

4.2 VOICE TRAFFIC VERIFICATION:

PHONE1 MAKES CALL TO PHONE2

Phone 1 should be able to engage in a phone call to phone 2, and at the same time, data traffic should continue without interruption. Voice traffic has been assigned to a predefined VLAN ID (VID 21) with a predefined priority.

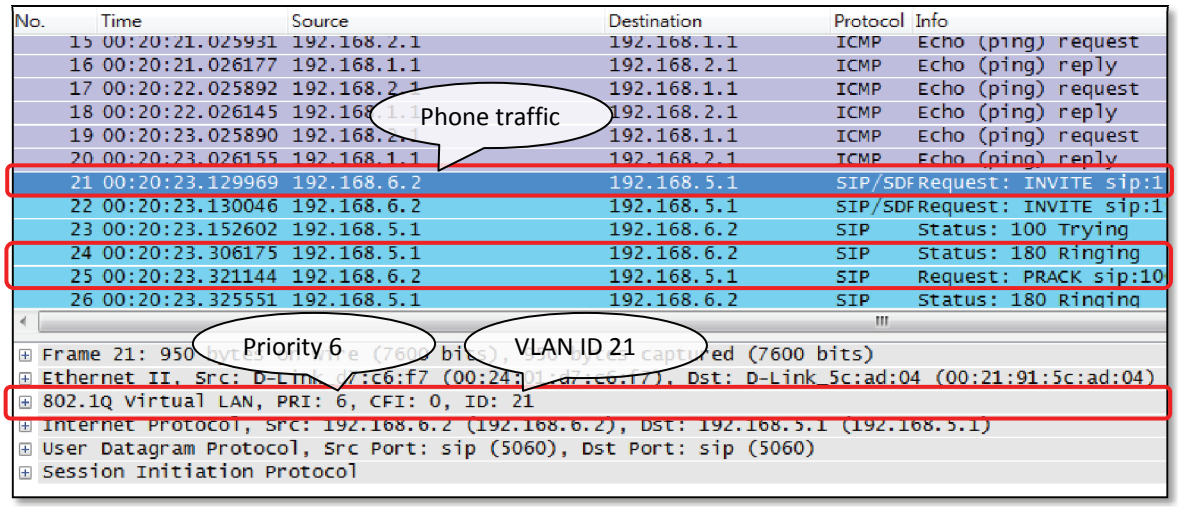

Figure 19: Packet Analysis of Voice Traffic

4.3 VLAN MEMBERSHIP VERIFICATION

Check the DGS-1210's VLAN table (below) to ensure that the VLAN assignments match your pre-defined policy. The screenshot below shows that port 1 belongs to the Voice VLAN, VID 21 (Voice2) when it detects voice traffic (tagged traffic), but it belongs to the Data VLAN, VID 11 (v2) during normal operations (untagged traffic).

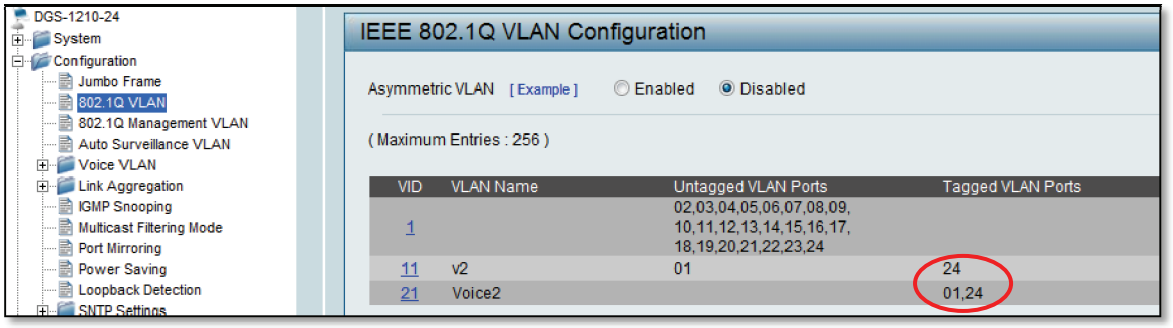

Figure 20: The DGS-1210's VLAN Table

In the screenshot below, PC1 (00-16-36-2D-D1-7F) was assigned to a Data VLAN – VID 10. PC2 (00-11-95-C5-D9-E8) was assigned to another Data VLAN – VID 11.

Phone1 (00-24-01-D7-C6-FA) and phone2 (00-24-01-EF-C6-F6) were assigned to voice VLANs – VID 20 (Voice1) and VID 21 (Voice2).

Thus, all the results meet our pre-defined rules.

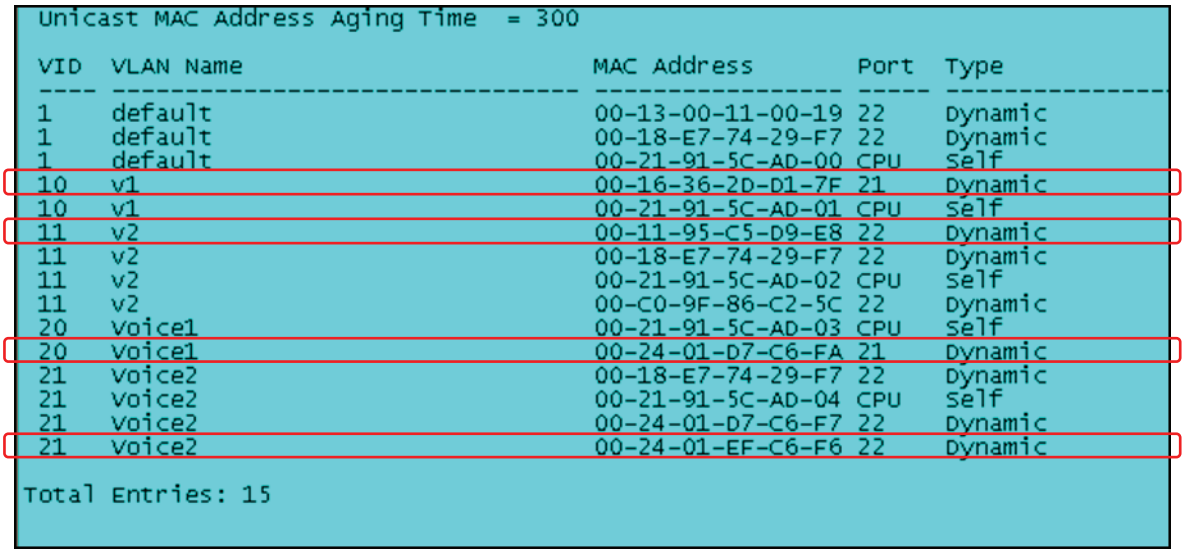

Figure 21: FDB Table Result