

TECHNICAL WHITE PAPER

VoIP Deployment on ArubaOS-Switch

ArubaOS-Switch 16.06

PURPOSE

Support for Voice over IP (VoIP) solution deployments is a key feature of Aruba's campus access switching lineup. With support for features including Power over Ethernet (PoE), voice VLAN support, device profiles, Cisco Discovery Protocol (CDP), Link Layer Discovery Protocol (LLDP), and Quality of Service (QoS), ArubaOS-Switch can make deploying IP phones simpler and faster than ever.

CONFIGURATION

Pre-standard voice VLAN detection with CDP

Older IP phones that do not support LLDP for voice VLAN configuration must utilize CDP instead. By default, CDP is enabled on ArubaOS-Switch but is set to receive-only on all interfaces. The CDP mode must be set to pre-standard-voice in order to allow these phones to properly detect the voice VLAN:

```
switch(config)# cdp mode pre-standard-voice
```

PoE pre-standard device detection

For older IP phones that predate the 802.3af PoE standard, pre-standard device detection must be enabled on any ports these devices are expected to be connected to. To enable this feature for all ports, use the following command:

```
switch(config)# power-over-ethernet pre-std-detect
```

Pre-standard device detection can also be enabled for individual ports or for an entire module, by using one of these command variations:

```
switch(config)# power-over-ethernet pre-std-detect ports <portlist>  
switch(config)# power-over-ethernet pre-std-detect slot <module>
```

For IP phones that are compliant with 802.3af or 802.3at (PoE+), no specific configuration is required. PoE+ phones require the switch to have a PoE+ power supply installed with sufficient power available. To display switch PoE status, use the following command:

```
switch# show power-over-ethernet
```

Status and Counters - System Power Status

Chassis power-over-ethernet:

```
Total Available Power   : 136 W
Total Power Drawn        :    0 W +/- 6W
Total Power Reserved     :    0 W
Total Remaining Power    : 136 W
```

Internal Power

	Main Power	
PS	(Watts)	Status
----	-----	-----
1	136	POE+ Connected

Voice VLAN configuration

At least one VLAN on the switch should be configured as a voice VLAN; these are typically assigned as a tagged VLAN to ports where phones are expected to be connected, though they can also be allocated dynamically using device profiles (as described in a later section).

To configure a voice VLAN, enter the VLAN's context and use the voice command:

```
switch(config)# vlan 100
switch(vlan-100)# voice
```

To set up DHCP relaying to allow the phone to get an IP address from a server on a different subnet, configure an IP address and an IP helper address on the VLAN:

```
switch(vlan-100)# ip address 10.100.0.1/24
switch(vlan-100)# ip helper-address 10.1.10.99
```

To statically assign the voice VLAN to ports, use the `tagged` command from the VLAN context:

```
switch(vlan-100)# tagged 1-6
```

Device Profiles for automatic port configuration

Rather than statically assigning VLANs and settings to switch ports, device profiles can be defined to automatically provision a port if an IP phone (or other device) is plugged into it, eliminating the need to restrict users to connecting devices only to specific switch ports.

The first step is to create a device identity, using the LLDP OUI and sub-type defined in the IP phone's LLDP Organizationally Specific TLV. This example uses the TIA standard OUI, which is used by some IP phones:

```
switch(config)# device-identity name "VoIP-Phone"
switch(identity-VoIP-Phone)# lldp oui 0012bb sub-type 1
switch(identity-VoIP-Phone)# exit
```

Next, create the device profile with settings to be applied to provisioned ports:

```
switch(config)# device-profile name "Phone-Profile"
switch(device-profile)# tagged-vlan 100
switch(device-profile)# untagged-vlan 110
switch(device-profile)# allow-jumbo frames
switch(device-profile)# exit
```

Lastly, associate the device identity with the new profile, and enable the profile for that device type:

```
switch(config)# device-profile device-type "VoIP-Phone"
switch(device-VoIP-Phone)# associate "Phone-Profile"
switch(device-VoIP-Phone)# enable
switch(device-VoIP-Phone)# exit
```

Once the profile is active, any time a matching device is connected to a switch port, the settings defined in the profile are applied to that port.

To display the current settings for a given device profile, use the following command:

```
switch# show device-profile config "Phone-Profile"
```

Device Profile Configuration

Configuration for device-profile : Phone-Profile

```
untagged-vlan      : 110
tagged-vlan        : 100
ingress-bandwidth  : 100%
egress-bandwidth   : 100%
cos                : 6
speed-duplex       : auto
poe-max-power      : Class/LLDP
poe-priority       : critical
allow-jumbo-frames : Enabled
allow-tunneled-node: Disabled
```

SUPPORTED PLATFORMS

The features described in this document are available in the following Aruba switch families:

- Aruba 2530 Switch Series
- Aruba 2540 Switch Series
- Aruba 2930F Switch Series
- Aruba 2930M Switch Series
- Aruba 3810M Switch Series
- Aruba 5400R Switch Series