

LAB GUIDE

Layer 2 Access Switch Management & Connectivity

IMPORTANT! THIS GUIDE ASSUMES THAT THE AOS-CX OVA HAS BEEN INSTALLED AND WORKS IN GNS3 OR EVE-NG. PLEASE REFER TO GNS3/EVE-NG INITIAL SETUP LABS IF REQUIRED.

<https://www.eve-ng.net/index.php/documentation/howtos/howto-add-aruba-cx-switch/>

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Lab Objective

The lab will enable the user to gain hands on knowledge and experience in setup basic management reachability and connectivity to access Layer 2 switches such as the Aruba CX 6100 to and from an upstream network.

To simulate the Aruba CX 6100, we will limit the features we use in the simulator to replicate this product, such as using default VRF and static routing.

For further details on Aruba CX 6100 switches and other features please refer to the latest Aruba documentation located on <https://asp.arubanetworks.com/>

Lab Overview

This lab set up is as shown in Figure 1. Aruba CX simulator will be used at both Access, Aggregation and Management, the Core switch is not used in this lab and is provided for completeness to replicate a possible 3 tier topology and will be used as a follow up in another lab.

At the end of the lab you will be able to Manage the Layer 2 access switch from the upstream management network as well as send traffic from an endpoint to the upstream network.

In the overall network architecture, we trunk VLANS from Access to Aggregation for User Data, and make one VLAN have a Layer 3 address on the Access switch to make it reachable for management purposes.

Lab Network Layout

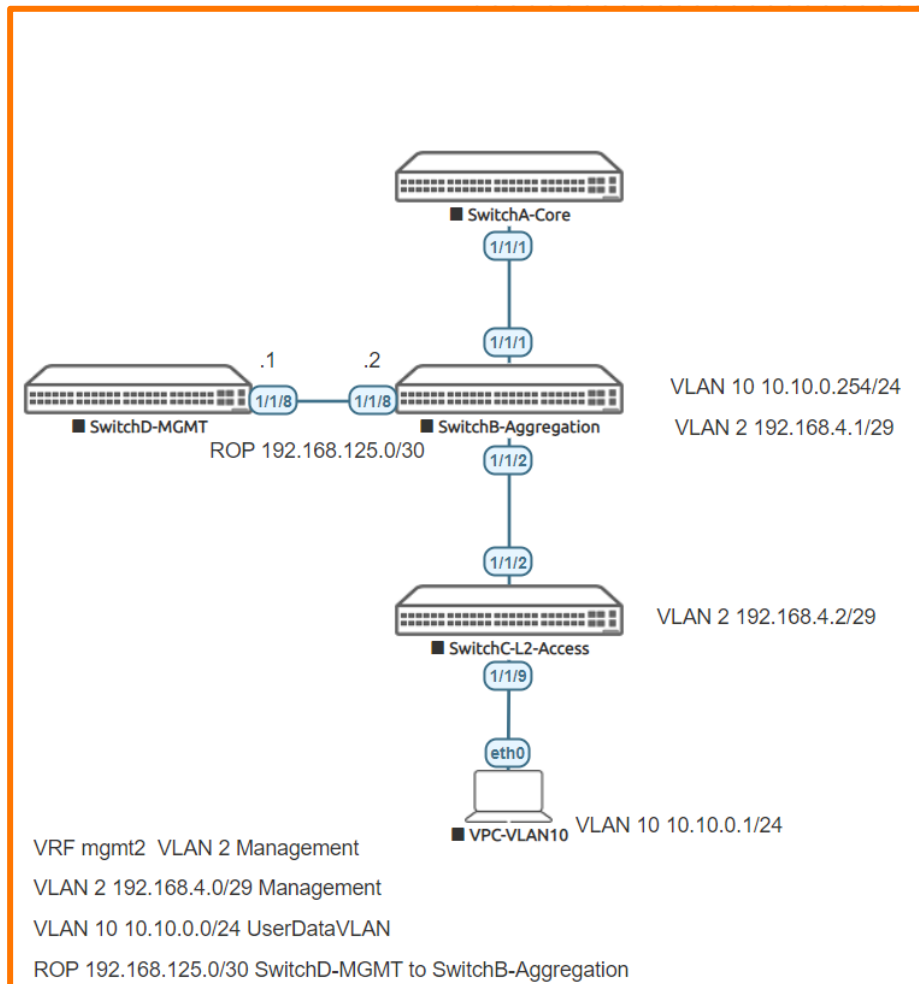


Figure 1. Lab topology

Lab Tasks

Task 1 - Lab setup

For this lab refer to Figure 1 for topology setup. Open switch B, C and D consoles and log in with user “admin” and no password. **Note:** Switch A is not used in this lab

```
configure
hostname <device host name>
```

- On **Switch B and C** bring up on 1/1/2:

```
int 1/1/2
no shutdown
```

use “exit” to go back a level

- On **Switch B and D** bring up interface 1/1/8:

```
int 1/1/8
```

```
no shutdown
exit
```

- Validate LLDP neighbors appear as expected on each switch. Here we show Switch B output only.

```
SwitchB# show lldp neighbor-info
```

```
LLDP Neighbor Information
```

```
=====
```

```
Total Neighbor Entries      : 1
Total Neighbor Entries Deleted : 0
Total Neighbor Entries Dropped : 0
Total Neighbor Entries Aged-Out : 0
```

LOCAL-PORT	CHASSIS-ID	PORT-ID	PORT-DESC	TTL	SYS-NAME
1/1/2	08:00:09:37:fa:11	1/1/2	1/1/2	120	SwitchC

```
SwitchB# conf t
SwitchB(config)# int 1/1/8
SwitchB(config-if)# no shut
SwitchB(config-if)# show lldp neighbor-info
```

```
LLDP Neighbor Information
```

```
=====
```

```
Total Neighbor Entries      : 2
Total Neighbor Entries Deleted : 0
Total Neighbor Entries Dropped : 0
Total Neighbor Entries Aged-Out : 0
```

LOCAL-PORT	CHASSIS-ID	PORT-ID	PORT-DESC	TTL	SYS-NAME
-	-	-	-	-	-
1/1/2	08:00:09:37:fa:11	1/1/2	1/1/2	120	SwitchC
1/1/8	08:00:09:1a:9e:de	1/1/8	1/1/8	120	SwitchD

Task 2 - Configure VLANs, IP, VRF and Static Routing

On **Switch B** Aggregation configure:

- Two Vlans 2 and 10, and trunk them on 1/1/2
- Single VRF mgmt2
- Two VLAN interfaces
- Basic IP addressing as per topology, and put VLAN2 in VRF mgmt2 as well as IP of interface 1/1/8
- Save the configuration

```
SwitchB#
```

```
SwitchB# configure
vlan 2,10
  exit
vlan 2
  description management
vlan 10
  description UserData
  exit
vrf mgmt2
  exit
int vlan 2
  vrf attach mgmt2
ip address 192.168.4.1/29
int vlan 10
  ip address 10.10.0.254/24
int 1/1/2
  no routing
  vlan trunk allowed 2,10
int 1/1/8
  ip address 192.168.125.2/30
  vrf attach mgmt2

exit
exit
wr mem
Copying configuration: [Success]
```

On **Switch C** L2 Access configure :

- Two Vlans 2 and 10, and trunk them on 1/1/2
- One VLAN interface (VLAN2) with an IP address applied for management
- Access port 1/1/9 for user data, VLAN 10
- Create a static route to next hop to Switch Aggregation for VLAN 2 (CX 6100 only has static routes)
- Enable SSH in the default VRF (CX 6100 only has default VRF)
- Save the configuration
- Test connectivity

```
SwitchC#
configure
vlan 2,10
vlan 2
    description management
vlan 10
    description UserData
interface 1/1/2
    no routing
    vlan trunk allowed 2,10
int vlan 2
    ip address 192.168.4.2/29
int 1/1/9
    no routing
    no shut
    vlan access 10
    exit
ip route 0.0.0.0/0 192.168.4.1
ssh server vrf default
exit
exit
wr mem
Copying configuration: [Success]
```

- Validate basic connectivity on VLAN 2, both 192.168.4.1 and 192.168.125.2 on Switch B should be reachable from Switch C

```
SwitchC# ping 192.168.4.1
PING 192.168.4.1 (192.168.4.1) 100(128) bytes of data.
108 bytes from 192.168.4.1: icmp_seq=1 ttl=64 time=8.38 ms
108 bytes from 192.168.4.1: icmp_seq=2 ttl=64 time=13.7 ms
108 bytes from 192.168.4.1: icmp_seq=3 ttl=64 time=2.19 ms
108 bytes from 192.168.4.1: icmp_seq=4 ttl=64 time=2.04 ms
108 bytes from 192.168.4.1: icmp_seq=5 ttl=64 time=2.12 ms

--- 192.168.4.1 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4003ms
rtt min/avg/max/mdev = 2.047/5.707/13.785/4.712 ms
SwitchC# ping 192.168.125.2
PING 192.168.125.2 (192.168.125.2) 100(128) bytes of data.
108 bytes from 192.168.125.2: icmp_seq=1 ttl=64 time=4.60 ms
108 bytes from 192.168.125.2: icmp_seq=2 ttl=64 time=1.90 ms
108 bytes from 192.168.125.2: icmp_seq=3 ttl=64 time=1.62 ms
108 bytes from 192.168.125.2: icmp_seq=4 ttl=64 time=1.74 ms
108 bytes from 192.168.125.2: icmp_seq=5 ttl=64 time=3.57 ms

--- 192.168.125.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4003ms
rtt min/avg/max/mdev = 1.621/2.690/4.607/1.193 ms
```

On **Switch D** Management configure:

- IP for 1/1/8
- Default Static route to Switch B
- Test SSH connectivity to L2 access.

```
SwitchD#
configure
int 1/1/8
    ip address 192.168.125.1/30
    exit
ip route 0.0.0.0/0 192.168.125.2
exit
exit
```

- Validate basic connectivity from Switch D to Switch C

```
SwitchD#
ping 192.168.4.2
PING 192.168.4.2 (192.168.4.2) 100(128) bytes of data.
108 bytes from 192.168.4.2: icmp_seq=1 ttl=63 time=2.98 ms
108 bytes from 192.168.4.2: icmp_seq=2 ttl=63 time=3.20 ms
108 bytes from 192.168.4.2: icmp_seq=3 ttl=63 time=3.76 ms
108 bytes from 192.168.4.2: icmp_seq=4 ttl=63 time=3.64 ms
108 bytes from 192.168.4.2: icmp_seq=5 ttl=63 time=2.77 ms

--- 192.168.4.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 2.772/3.273/3.765/0.384 ms
SwitchD(config)#
```

- The above essentially shows we have access to the Access switch from our management network. Now test SSH connectivity from Switch D to Switch C

```
SwitchD# ssh admin@192.168.4.2 ←---SSH to Switch C from Switch D
```

```
The authenticity of host '192.168.4.2 (192.168.4.2)' can't be established.
ECDSA key fingerprint is SHA256:01lyDBMknV3E/P8X04DJQitLWNEWAl8at3ybpGZGvPc.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.4.2' (ECDSA) to the list of known hosts.
```

```
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(ALA) documents are available at the following URL:
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As a reminder, there is no support or warranty associated with this platform.
```

```
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```

```
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```

```
admin@192.168.4.2's password:
```

```
Last login: 2021-06-27 14:49:19 from the console
User "admin" has logged in 2 times in the past 30 days
```

```
SwitchC#
exit
SwitchD#
```

←---exit to logout of SSH session

Task 3 – Test User Connectivity from Virtual PC (VPC)

Power up VPC and configure, then test.

- Add IP address , mask and default gateway
- Test Vlan 10 connectivity to upstream Aggregation 10.10.0.254

```
.  
Welcome to Virtual PC Simulator, version 1.0 (0.8c)  
Dedicated to Daling.  
Build time: Dec 31 2016 01:22:17  
Copyright (c) 2007-2015, Paul Meng (mirnshi@gmail.com)  
All rights reserved.
```

```
VPCS is free software, distributed under the terms of the "BSD" licence.  
Source code and license can be found at vpcs.sf.net.  
For more information, please visit wiki.freecode.com.cn.  
Modified version supporting unetlab by unetlab team
```

```
Press '?' to get help.
```

```
VPCS> ip 10.10.0.1/24 10.10.0.254  
Checking for duplicate address...  
PC1 : 10.10.0.1 255.255.255.0 gateway 10.10.0.254
```

```
VPCS> ping 10.10.0.254
```

```
84 bytes from 10.10.0.254 icmp_seq=1 ttl=64 time=2.896 ms  
84 bytes from 10.10.0.254 icmp_seq=2 ttl=64 time=2.899 ms  
84 bytes from 10.10.0.254 icmp_seq=3 ttl=64 time=2.649 ms  
84 bytes from 10.10.0.254 icmp_seq=4 ttl=64 time=1.960 ms  
84 bytes from 10.10.0.254 icmp_seq=5 ttl=64 time=1.873 ms
```

```
VPCS>
```

End of lab

Appendix – Complete Configurations

- If you face issues during your lab, you can verify your configs with the configs listed in this section
- If configs are the same, try powering off/powering on the switches to reboot them.

Switch B

```
SwitchB#
led locator on
vrf mgmt2
!
!
!
!
ssh server vrf mgmt
vlan 1
vlan 2
    description management
vlan 10
    description userData
interface mgmt
    no shutdown
    ip dhcp
interface 1/1/1
    no shutdown
    no routing
    vlan access 1
interface 1/1/2
    no shutdown
    no routing
    vlan trunk native 1
    vlan trunk allowed 2,10
interface 1/1/8
    no shutdown
    vrf attach mgmt2
    ip address 192.168.125.2/30
interface vlan 2
    vrf attach mgmt2
    ip address 192.168.4.1/29
interface vlan 10
    ip address 10.10.0.254/24
!
!
!
!
!
https-server vrf mgmt
SwitchB#
```

Switch C

```
SwitchC#
led locator on
!
!
!
!
!
ssh server vrf default
ssh server vrf mgmt
vlan 1
vlan 2
    description management
vlan 10
    description UserData
interface mgmt
    no shutdown
    ip dhcp
interface 1/1/2
    no shutdown
    no routing
    vlan trunk native 1
    vlan trunk allowed 2,10
```

```
interface 1/1/9
  no shutdown
  no routing
  vlan access 10
interface vlan 2
  ip address 192.168.4.2/29
ip route 0.0.0.0/0 192.168.4.1
!
!
!
!
!
https-server vrf mgmt
SwitchC#
```

Switch D

```
SwitchD#
hostname SwitchD
led locator on
!
!
ssh server vrf mgmt
vlan 1
interface mgmt
  no shutdown
  ip dhcp
interface 1/1/8
  no shutdown
  ip address 192.168.125.1/30
ip route 0.0.0.0/0 192.168.125.2
!
!
!
!
!
https-server vrf mgmt
SwitchD#
```