NET3720 - Fall 2021 – Jenkins

Lab 7 – Attenuation Measurement

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Lab Objectives:

- Connect (2) Cisco AP's and find the Attenuation measurements

Hardware needed:
- (2) Cisco Aironet 3700 AP
- (2) ZYCEL PoE Switch
- (1) USB to RS232 cable
- Computer 1 – Console
-

Software:
- Console application
  - PuTTY http://the.earth.li/~sgtatham/putty/latest/x86/putty.exe
  - Instructions on how to download PuTTY
    - https://www.weber.edu/CS/remote-access.html

Instructions:
In this lab you will learn how to configure a Cisco AP unit using the CLI. You will connect Cisco AP 1 to computer 1. Then you will get the dB distance between the two AP's and see what ratings you get from when communicating from each other. I will be testing 3 different things. 1 window, 2 metal doors and 1 wood door. We will testing these with the doors open and closed and see what we get.

Method:
Power up two ZYXEL switches, and open up lab 6 commands after that. Open up PuTTY and click on **Serial** then type **/dev/ttyUSB0** and then open.

Connections:
Get a cat6 cable connect to the **ZYXEL switch**, Do this twice to both switches. Get your console computer and connect the USB to RS232 to your computer. Connect a bridge between both AP's. So make sure your AP's are connected to their own switch.

Turn on the **ZYXEL swtich** on, and make sure the USB is plugged in and make sure the computer pickups the USB.

Open up you Linux **Terminal**
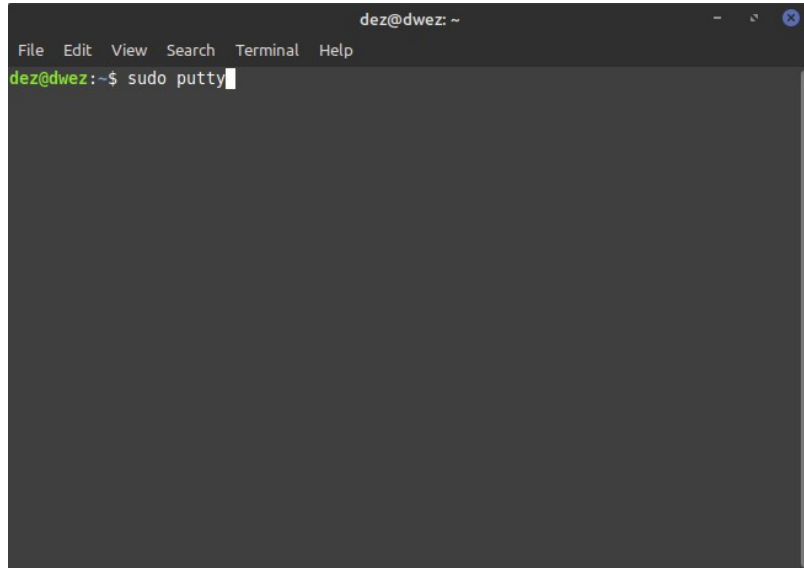
Type **sudo putty** in Terminal

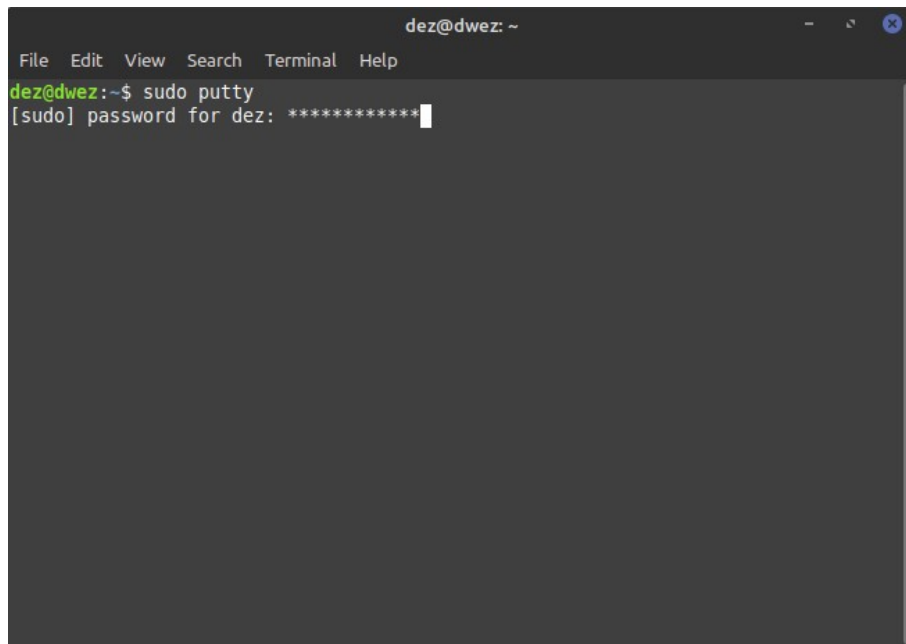*Figure 1: Terminal - sudo putty*

Type your **password** ----

Figure 2: Type password

Net3720-AP1

ZYXEL Switch

Cat.6 Cable

Cisco Aironet
3700 AP

Usb to RS232 + VGA to RJ-45

Net3720-AP2

ZYXEL Switch

Cat.6 Cable

Cisco Aironet
3700 AP

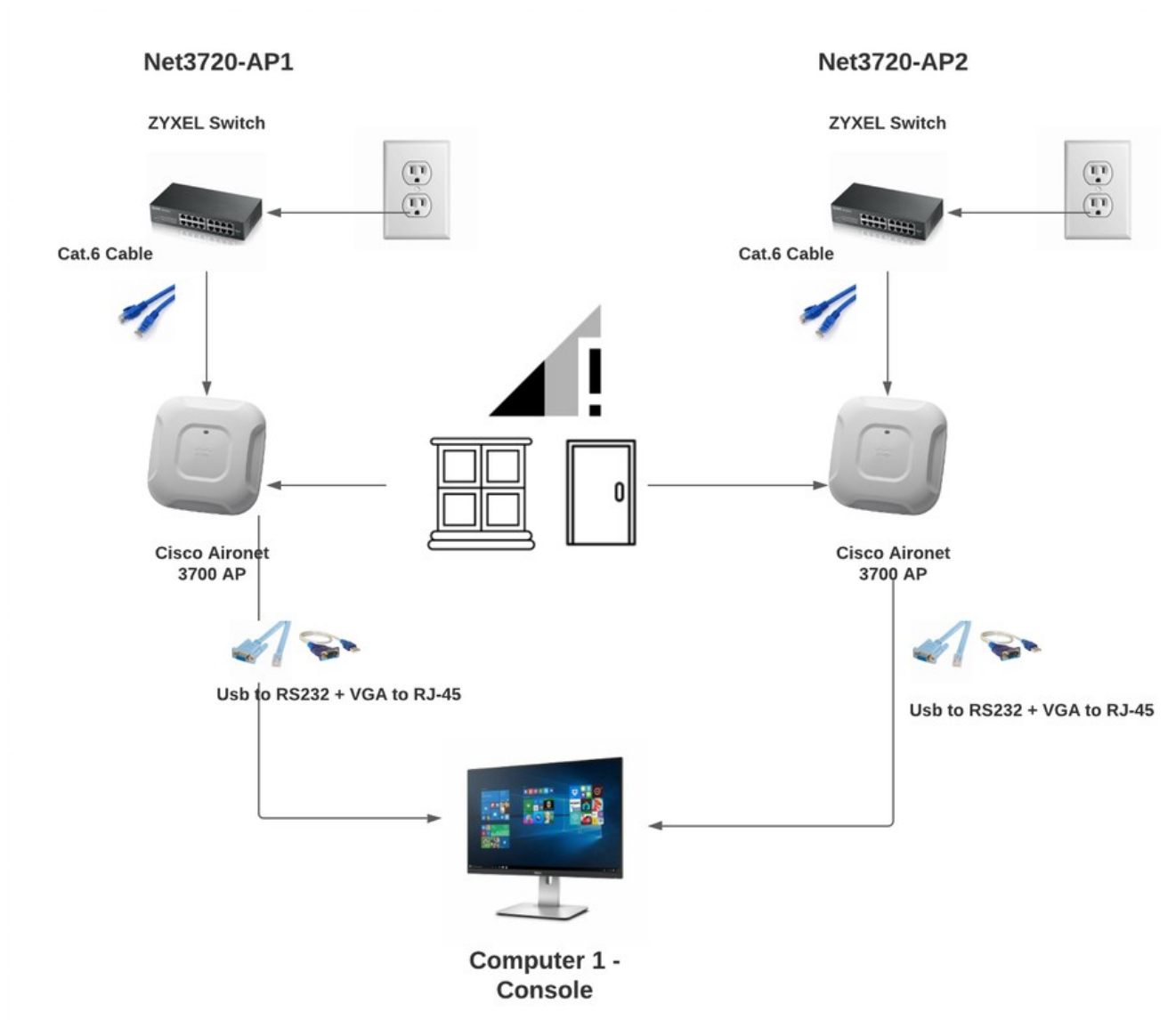Usb to RS232 + VGA to RJ-45

Computer 1 -
Console

Figure 3: Network layout- Finding the dB

After your putty should open up.
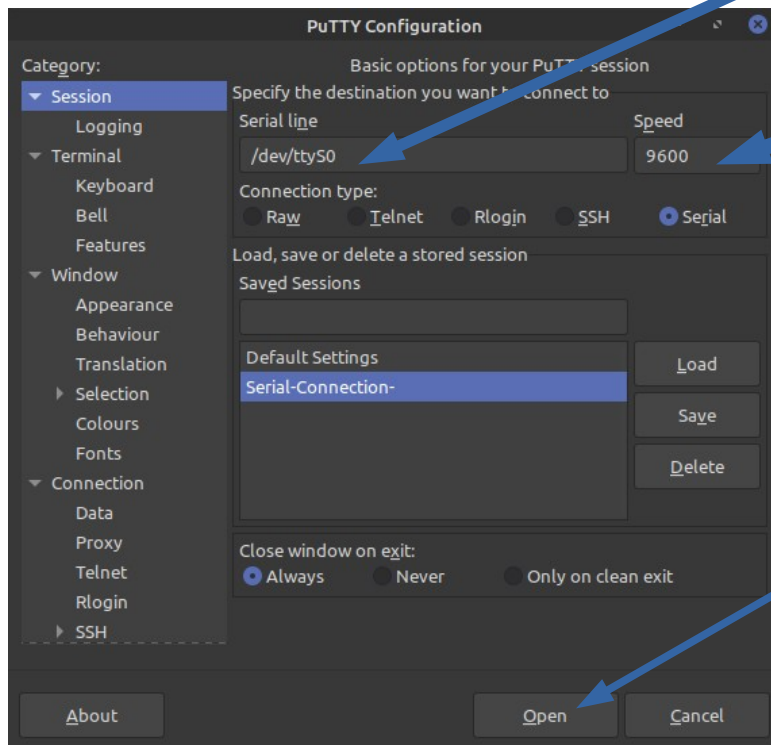Serial Line – Location should be open
Speed – 9600

Figure 4: PuTTY - Make sure these are the same

Setup 1 – This is the first part of this process. Input the

AP1 Configuration

Following commands:

ap> enable
Password: Cisco
ap# show running-config

(See if anything is configure- Move on if ok)

ap# hostname net3720-ap1

ap# config-term

net3720-ap1(config)#dot11 ssid net3720-Hernandez-bridge

net3720-ap1(config-ssid)#authentication open

net3720-ap1(config-ssid)#authentication key-management wpa version

net3720-ap1(config-ssid)#wpa-psk ascii 0 8012592236 (NOTE: This is a password and needs to be a
number)

net3720-ap1(config-ssid)#guest-mode

net3720-ap1(config-ssid)#interface Dot11Radio1

net3720-ap1(config-if)#encryption mode ciphers aes-ccm

net3720-ap1(config-if)#ssid net3720-Hernandez-bridge

net3720-ap1(config-if)#channel 165

net3720-ap1(config-if)#station-role root bridge

net3720-ap1(config-if)#no shut

net3720-ap1(config)#interface BVI 1

net3720-ap1(config-if)#ip address 10.1.1.1 255.255.255.0 (NOTE: I picked 10.1.1.1)

AP2 Configuration

Setup 2 – Unplug Console cable from the Cisco AP 1 and plug into Cisco AP 2. Make sure switch 2 is powered up.

Input the following commands:

ap>enable
Password: Cisco

ap(config)#hostname net3720-ap2

net3720-ap2(config)#dot11 ssid net3720-Hernandez-bridge

net3720-ap2(config-ssid)#authentication open

net3720-ap2(config-ssid)#authentication open

net3720-ap2(config-ssid)#authentication key-management wpa version 2

net3720-ap2(config-ssid)#wpa-psk ascii 0 8012592236

net3720-ap2(config-ssid)#interface Dot11Radio1

net3720-ap2(config-if)#encryption mode ciphers aes-ccm

net3720-ap2(config-if)#ssid net3720-Hernandez-bridge

net3720-ap2(config-if)#channel 165

net3720-ap2(config-if)#station-role non-root bridge

net3720-ap2(config-if)#no shut

Net3720-ap2(config)#interface BVI1

Net3720-ap2(config-if)#ip address 10.1.1.1 255.255.255.0

Capturing the dB

We are now going to do 6 different tests. **Test 1:** we are going to test the dB 13 feet away, with door open. **Test 2:** 13 ft away with door closed. **Test 3:** 10 ft away with a wall and distance. **Test 4:** through a window that is 20 years old. **Test 5:** with one drywall, two wood door, and one metal doors – closed. **Test 6:** with one drywall, one wood door, and 2 metal doors open.

<u>Input the following commands after each attempt:</u>

net3720-ap1#show dot11 associations all-client | include dBm

Test 1: 13ft door open

Signal strength –48 dBm

Here I had the door open and got -48 dBm.
Signal Strength   : -48 dBm   Connected for   : 47 seconds

Test 2: 13ft door closed

Signal strength –49 dBm

Here I had the door closed. I measured this length with a tape measure to get my numbers on length.
Signal Strength   : -49 dBm   Connected for   : 60 seconds

Test 3: 10ft door closed

Signal strength –38 dBm

This was 10ft away and they are directly from each other.
Signal Strength   : -38 dBm   Connected for   : 50 seconds

Test 4: 10 ft Through a window

Signal strength –44 dBm

This was 10 ft away and through a window. My house is about 20 yrs old.

Signal Strength   : -44 dBm   Connected for   : 52 seconds
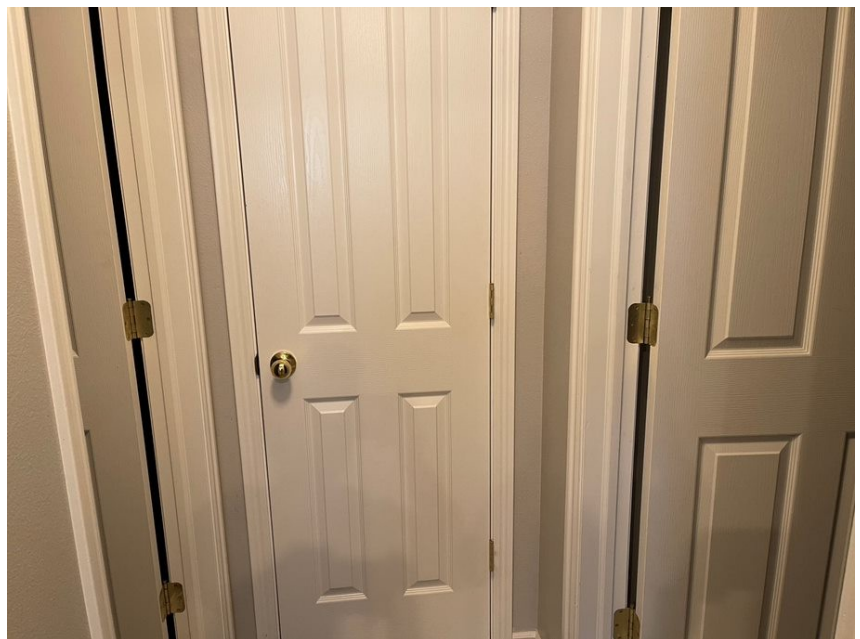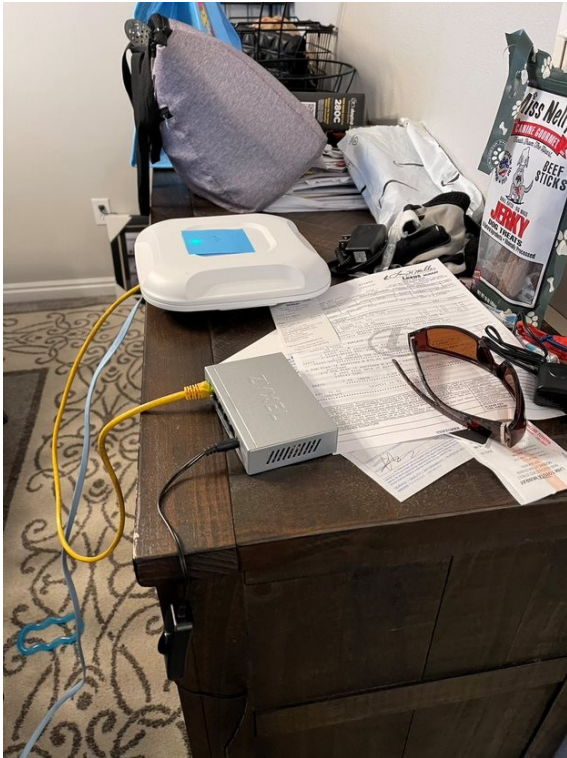
Test 5: 15ft one dry wall and 2 doors – closed

Signal strength –58 dBm

Test 5 was through one dry wall, and two wood door, and one metal doors.

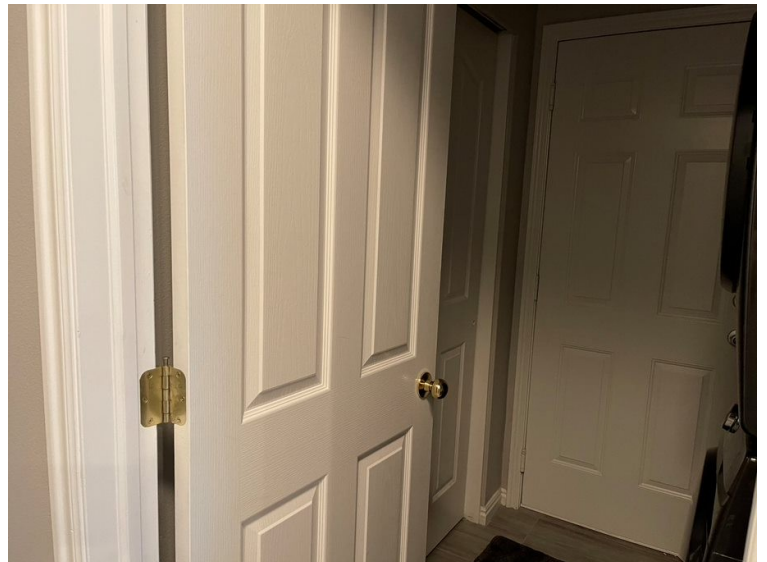Signal Strength   : -58 dBm   Connected for   : 47 seconds

Test 6: 15ft one dry wall and 2 doors – open

Signal strength –50 dBm

Test 6 was through one dry wall, and two wood door, and one metal doors, these were open.

Signal Strength   : -50 dBm   Connected for   : 47 seconds

AP1 – Show tech-support

------------------ show running-config ------------------

Building configuration...

Current configuration : 1623 bytes
!
! Last configuration change at 00:00:36 UTC Mon Mar 1 1993
version 15.3
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname net3720-ap1
!
!
logging rate-limit console 9
enable secret 5 <removed>
!
no aaa new-model
no ip source-route
no ip cef
!
!
!
!
dot11 pause-time 100
dot11 syslog
!
dot11 ssid net3720-Hernandez-bridge
   authentication open
   authentication key-management wpa version 2
   wpa-psk ascii 7 0757711D1C5C405745415D
!
!
!
no ipv6 cef
!
!
username Cisco password 7 <removed>
!
!
bridge irb
!

!
!
------------------ show running-config ------------------

Building configuration...

Current configuration : 1623 bytes
!
! Last configuration change at 00:00:36 UTC Mon Mar 1 1993
version 15.3
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname net3720-ap1
!
!
logging rate-limit console 9
enable secret 5 <removed>
!
no aaa new-model
no ip source-route
no ip cef
!
!
!
!
dot11 pause-time 100
dot11 syslog
!
dot11 ssid net3720-Hernandez-bridge
   authentication open
   authentication key-management wpa version 2
   wpa-psk ascii 7 0757711D1C5C405745415D
!
!
!
no ipv6 cef
!
!
username Cisco password 7 <removed>
!
!
bridge irb
!
!
!

```
interface Dot11Radio0
 no ip address
 shutdown
 antenna gain 0
 station-role root
 bridge-group 1
 bridge-group 1 subscriber-loop-control
 bridge-group 1 spanning-disabled
 bridge-group 1 block-unknown-source
 no bridge-group 1 source-learning
 no bridge-group 1 unicast-flooding
!
interface Dot11Radio1
 no ip address
 !
 encryption mode ciphers aes-ccm
 !
 ssid net3720-Hernandez-bridge
 !
 antenna gain 0
 peakdetect
 no dfs band block
 channel 5825
 station-role root bridge
 bridge-group 1
 bridge-group 1 spanning-disabled
!
interface GigabitEthernet0
 no ip address
 duplex auto
 speed auto
 bridge-group 1
 bridge-group 1 spanning-disabled
!
interface BVI1
 mac-address d8b1.9043.08bc
 ip address 10.1.1.1 255.255.255.0
 ipv6 address dhcp
 ipv6 address autoconfig
 ipv6 enable
!
ip forward-protocol nd
no ip http server
no ip http secure-server
ip http help-path http://www.cisco.com/warp/public/779/smbiz/prodconfig/help/eag
!
!
bridge 1 route ip
!
```

```
!
!
line con 0
line vty 0 4
 login local
 transport input all
!
endinterface Dot11Radio0
 no ip address
 shutdown
 antenna gain 0
 station-role root
 bridge-group 1
 bridge-group 1 subscriber-loop-control
 bridge-group 1 spanning-disabled
 bridge-group 1 block-unknown-source
 no bridge-group 1 source-learning
 no bridge-group 1 unicast-flooding
!
interface Dot11Radio1
 no ip address
 !
 encryption mode ciphers aes-ccm
 !
 ssid net3720-Hernandez-bridge
 !
 antenna gain 0
 peakdetect
 no dfs band block
 channel 5825
 station-role root bridge
 bridge-group 1
 bridge-group 1 spanning-disabled
!
interface GigabitEthernet0
 no ip address
 duplex auto
 speed auto
 bridge-group 1
 bridge-group 1 spanning-disabled
!
interface BVI1
 mac-address d8b1.9043.08bc
 ip address 10.1.1.1 255.255.255.0
 ipv6 address dhcp
 ipv6 address autoconfig
 ipv6 enable
!
ip forward-protocol nd
```

```
no ip http server
no ip http secure-server
ip http help-path http://www.cisco.com/warp/public/779/smbiz/prodconfig/help/eag
!
!
bridge 1 route ip
!
!
!
line con 0
line vty 0 4
 login local
 transport input all
!
end
```

AP2- Show tech-support

------------------ show running-config ------------------

Building configuration...

Current configuration : 1594 bytes
!
! Last configuration change at 00:01:44 UTC Mon Mar 1 1993
version 15.3
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname Net3720-ap2
!
!
logging rate-limit console 9
enable secret 5 <removed>
!
no aaa new-model
no ip source-route
no ip cef
!
!
!
!
dot11 pause-time 100
dot11 syslog
!
dot11 ssid net3720-Hernandez-bridge
   authentication open
   authentication key-management wpa version 2
   wpa-psk ascii 7 065E5F701E1B504B574444
!
!
!
no ipv6 cef
!
!
username Cisco password 7 <removed>
!
!
bridge irb

```
!
!
!
interface Dot11Radio0
 no ip address
 shutdown
 antenna gain 0
 station-role root
 bridge-group 1
 bridge-group 1 subscriber-loop-control
 bridge-group 1 spanning-disabled
 bridge-group 1 block-unknown-source
 no bridge-group 1 source-learning
 no bridge-group 1 unicast-flooding
!
interface Dot11Radio1
 no ip address
 !
 encryption mode ciphers aes-ccm
 !
 ssid net3720-Hernandez-bridge
 !
 antenna gain 0
 peakdetect
 station-role non-root bridge
 bridge-group 1
 bridge-group 1 spanning-disabled
!
interface GigabitEthernet0
 no ip address
 duplex auto
 speed auto
 bridge-group 1
 bridge-group 1 spanning-disabled
!
interface BVI1
 mac-address d8b1.9038.86a0
 ip address 10.1.1.2 255.255.255.0
 ipv6 address dhcp
 ipv6 address autoconfig
 ipv6 enable
!
ip forward-protocol nd
no ip http server
no ip http secure-server
ip http help-path http://www.cisco.com/warp/public/779/smbiz/prodconfig/help/eag
!
!
bridge 1 route ip
```

```
!
!
!
line con 0
line vty 0 4
 login local
 transport input all
!
end
```

References

Jenkins, L. (2021, October 20). Lecture. Interview. Layton, UT.