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## 1.1 Revision History

| DATE | VERSION | EDITOR | CHANGES |
|---|---|---|---|
| 17 Nov 2019 | 0.1 | Ariya Parsamanesh | Initial creation |
| 18 Nov 2019 | 0.2 | Ariya Parsamanesh | Added the L2 configuration |
| | | | |

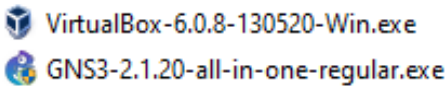
# 2 CX switch OVA setup

This is the first part of technote about setting up the virtual environment on Windows 10 laptop so that we can run a number of Aruba CX switch OVA as well as NetEdit OVA to configure them.

We'll make use of GNS3, VirtualBox and Aruba switch and NetEdit OVAs.

## 2.1 Things you need

- Windows 10 with min version of 10.0.16299.1387, that has at least 16G of memory
- VirtualBox version 6.0.8-130520
- GNS3 version 2.1.20

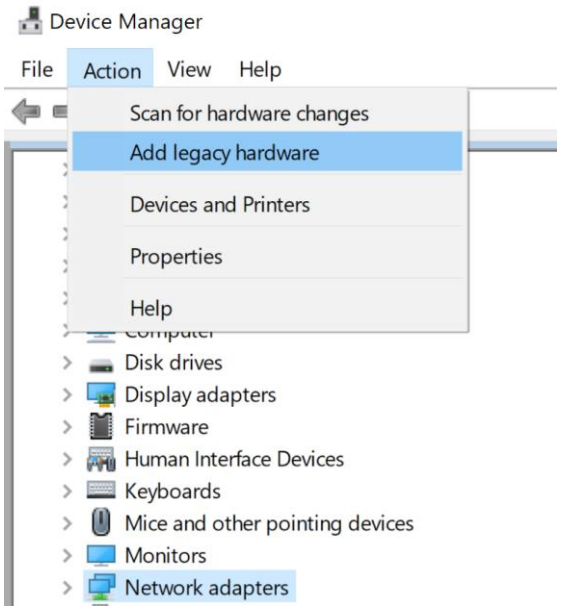


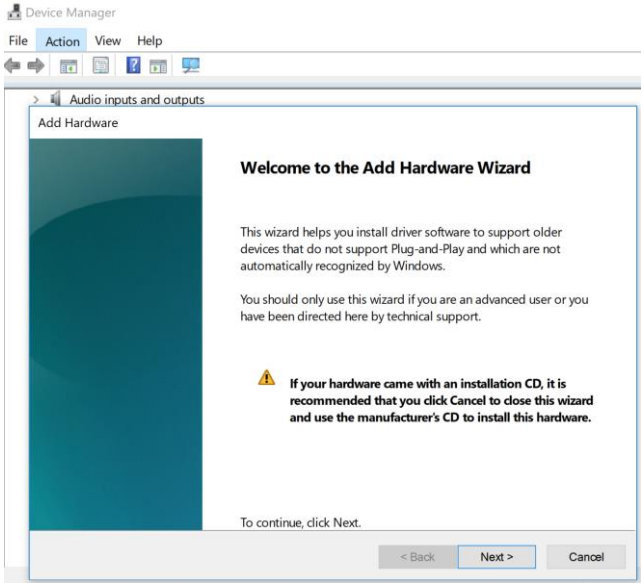
# 3 Win10 Laptop Setup

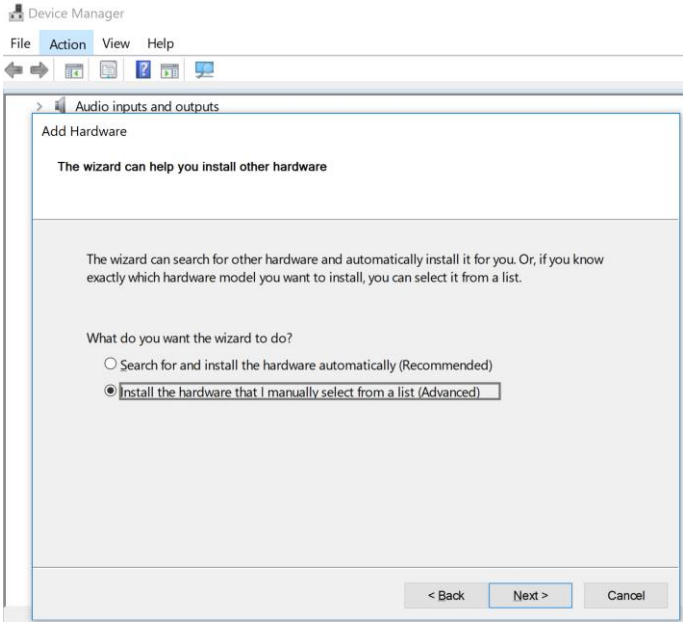
In this section we'll create a loopback interface so we can use it to connect our virtual CX switches to the outside networks.

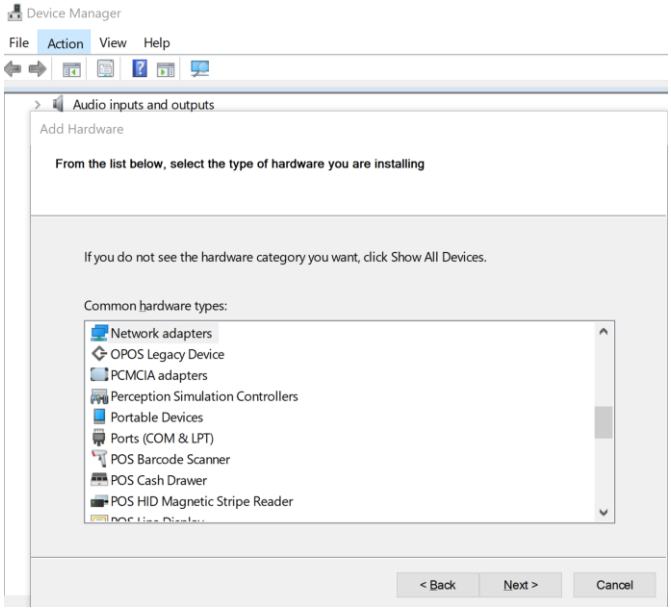
## 3.1 Loopback Interface Configuration

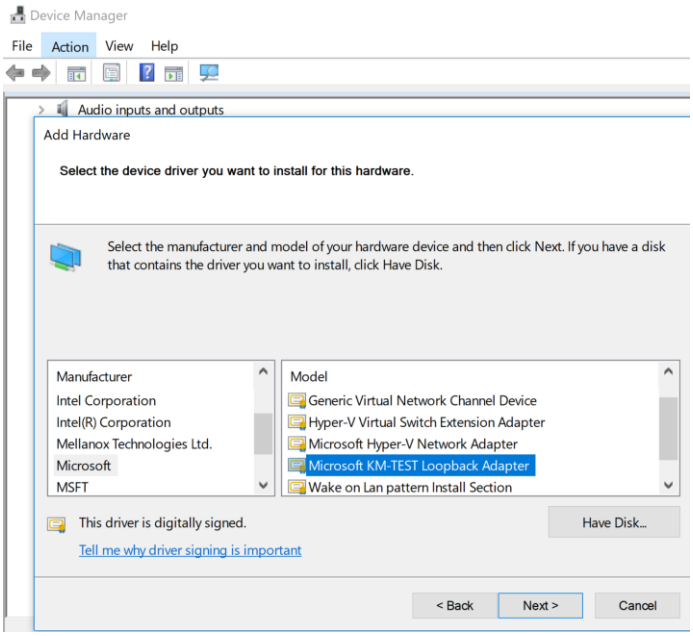
Open your Device Manager, select "Network Adapters" and add Legacy hardware

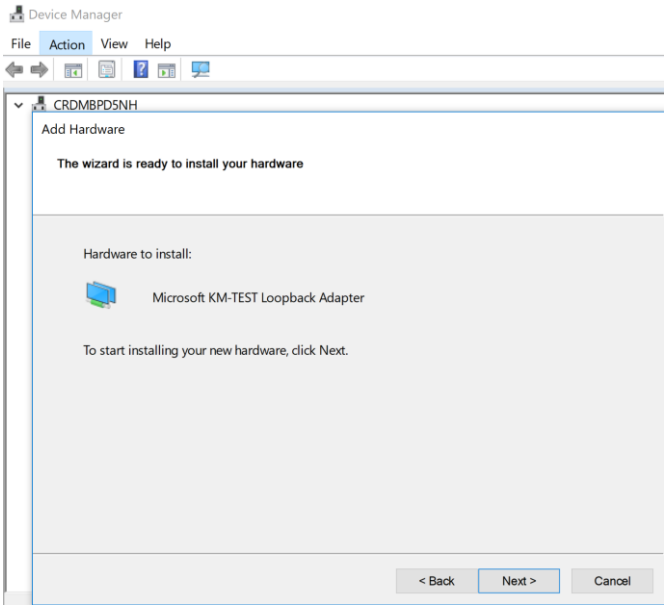





Once you finish the installation you can then assign a valid IP address to that interface.

## 3.2 Loopback Interface IP Address

Open the control panel and select “Network and sharing Centre” and then click on “change adapter setting”, your KM-Test adapter should be listed there, select it and then choose to rename it to “loopback” so that you can identify it easier. Then assign a static IP address to it and save setting.

Here is my setup, I have assigned 192.168.99.254/24 to it.

```
C:\>ipconfig/all

Windows IP Configuration

   Host Name . . . . . . . . . . . . : AriyaP
   Primary Dns Suffix  . . . . . . . :
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : Yes
   WINS Proxy Enabled. . . . . . . . : No
   DNS Suffix Search List. . . . . . : home

Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . : home
   Description . . . . . . . . . . . : Intel(R) 82579LM Gigabit Network Connection
   Physical Address. . . . . . . . . : F0-DE-F1-64-0A-82
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   IPv4 Address. . . . . . . . . . . : 192.168.1.123(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained. . . . . . . . . . : Sunday, November 17, 2019 8:39:39 AM
   Lease Expires . . . . . . . . . . : Monday, November 18, 2019 10:13:51 AM
   Default Gateway . . . . . . . . . : 192.168.1.1
   DHCP Server . . . . . . . . . . . : 192.168.1.1
   DNS Servers . . . . . . . . . . . : 1.1.1.1
                                       192.168.1.1
   NetBIOS over Tcpip. . . . . . . . : Enabled

Ethernet adapter Ethernet 3:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Npcap Loopback Adapter
```

```
   Physical Address. . . . . . . . . : 02-00-4C-4F-4F-50
   DHCP Enabled. . . . . . . . . . . : No
   Autoconfiguration Enabled . . . . : Yes
   IPv4 Address. . . . . . . . . . . : 172.16.2.10(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :
   NetBIOS over Tcpip. . . . . . . . : Enabled


Ethernet adapter Loopback:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Microsoft KM-TEST Loopback Adapter
   Physical Address. . . . . . . . . : 02-00-4C-4F-4F-50
   DHCP Enabled. . . . . . . . . . . : No
   Autoconfiguration Enabled . . . . : Yes
   IPv4 Address. . . . . . . . . . . : 192.168.99.254(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :
   NetBIOS over Tcpip. . . . . . . . : Enabled

Wireless LAN adapter Wi-Fi:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . : home
   Description . . . . . . . . . . . : Intel(R) Centrino(R) Advanced-N 6205
   Physical Address. . . . . . . . . : A0-88-B4-50-C0-84
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes

C:\>
```

# 4 VirtualBox

Here we'll cover the installation and setup of VirtualBox. Try to get this specific version as it works nicely with most of the windows and MAC laptops, however you can also use other version and spend time getting it to work.

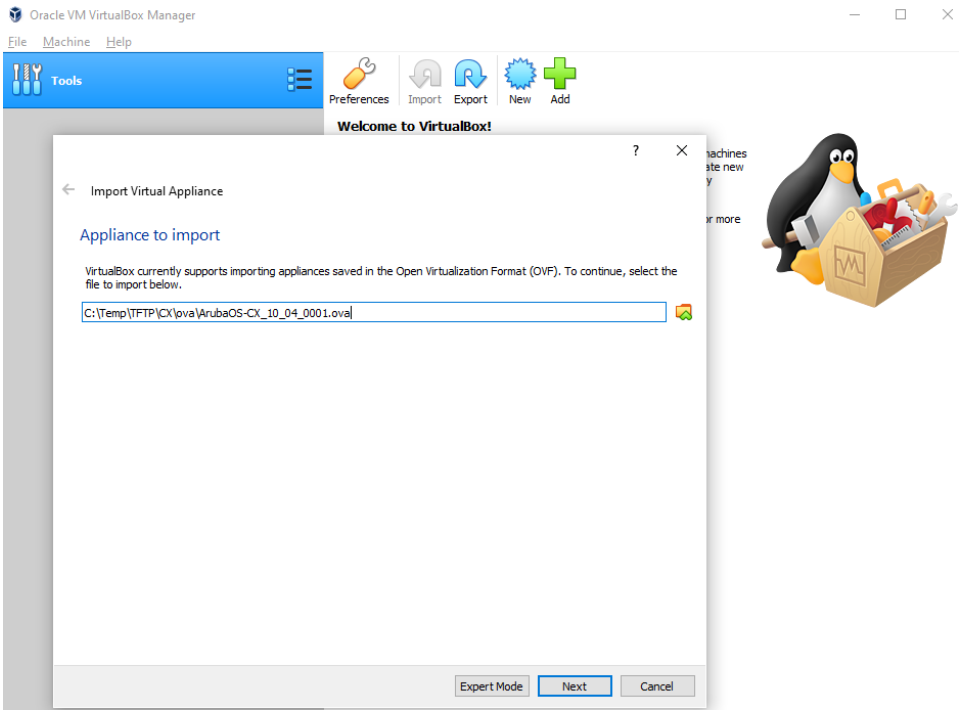
The installation is straight forward so we won't be covering it here. We'll start with importing the OVA images.

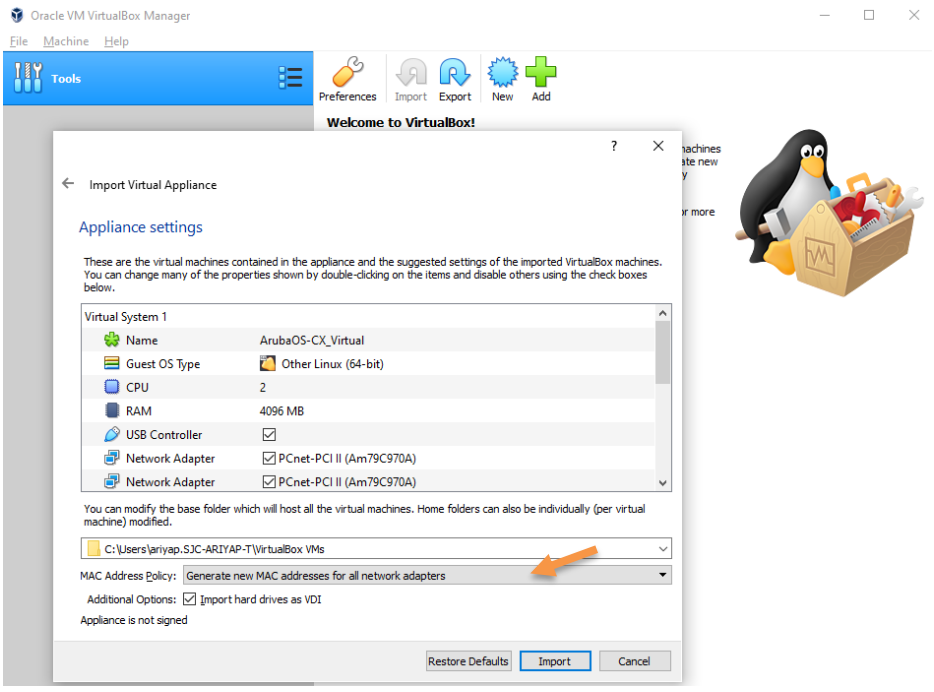
## 4.1 Importing Aruba OVA Images

Here we'll have 2x OVA images that we want to import

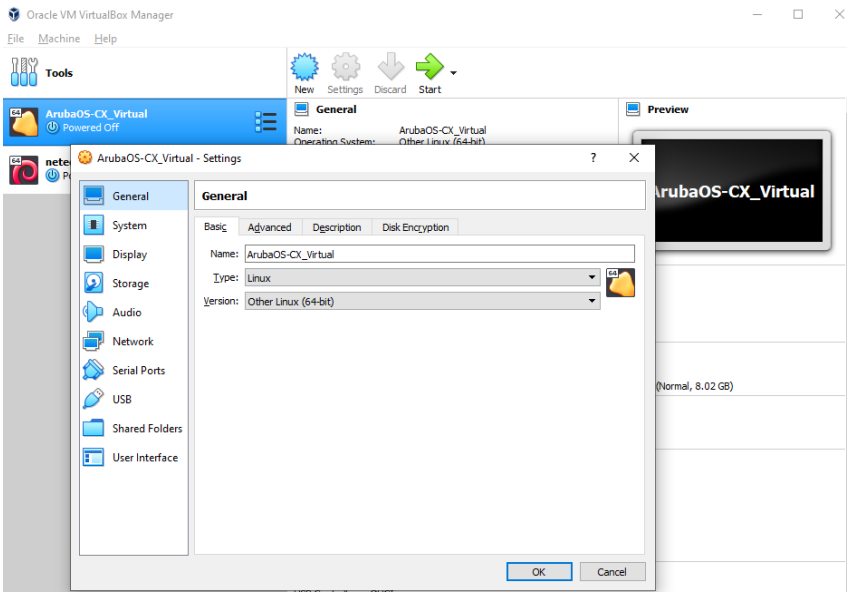
1. ArubaOS-CX_10_04_0001.ova
2. Aruba_NetEdit-2.0.0.ova

We'll start with the CX ova file.

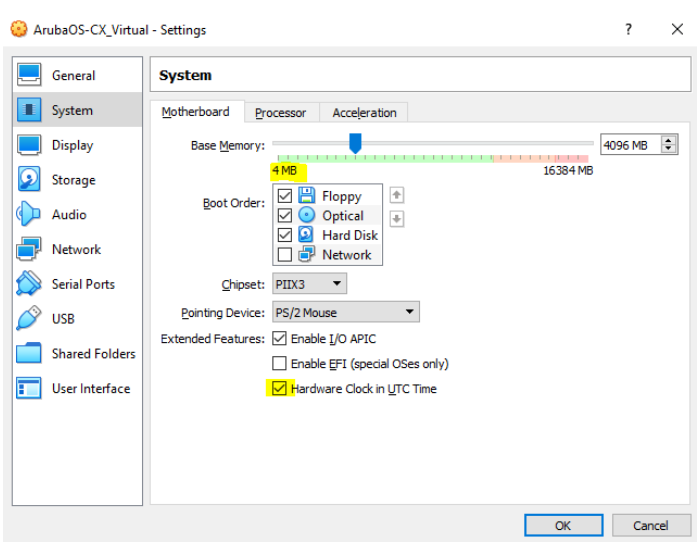


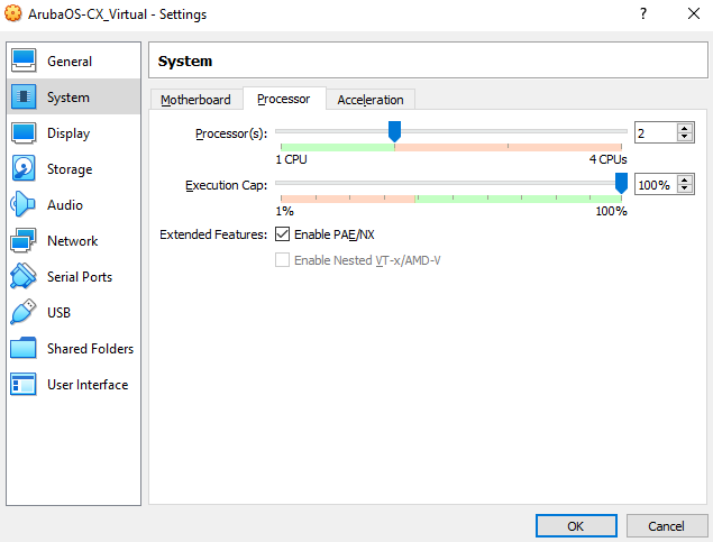



Do the same for the NetEdit ova as well. Next we'll edit the setting for the ArubaOS-CX machine.

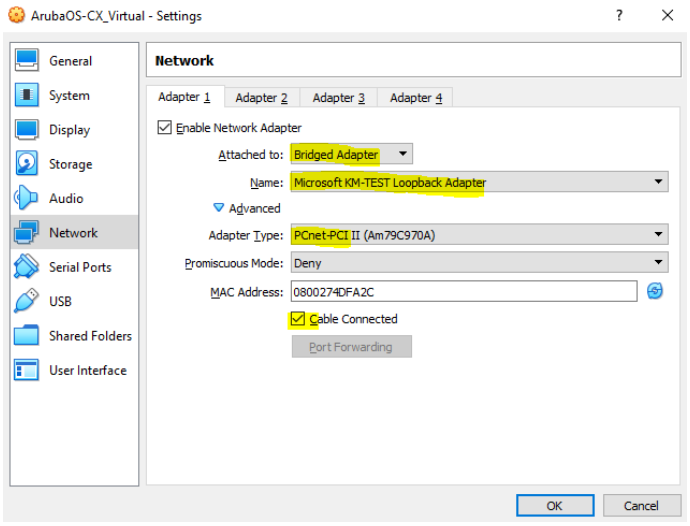



Check to see that CPU is set to 2 and memory is set to 4G and set the checkbox for "Hardware clock in UTC Time"




Then go to the Network section and select these setting only for the Adapter1, leave the rest of the Adapters 2-4 as their default settings.

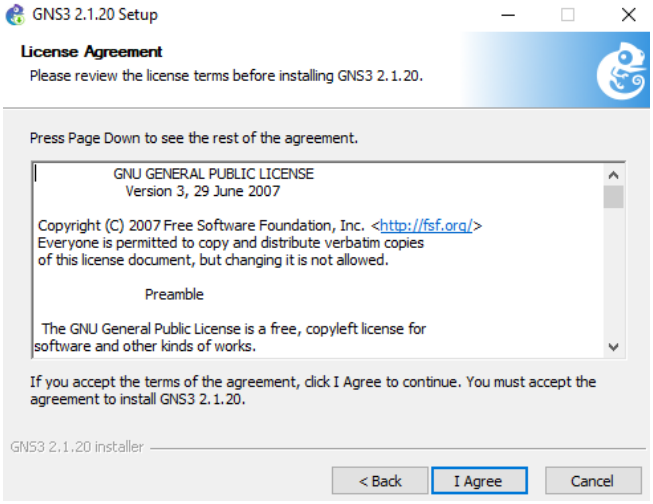


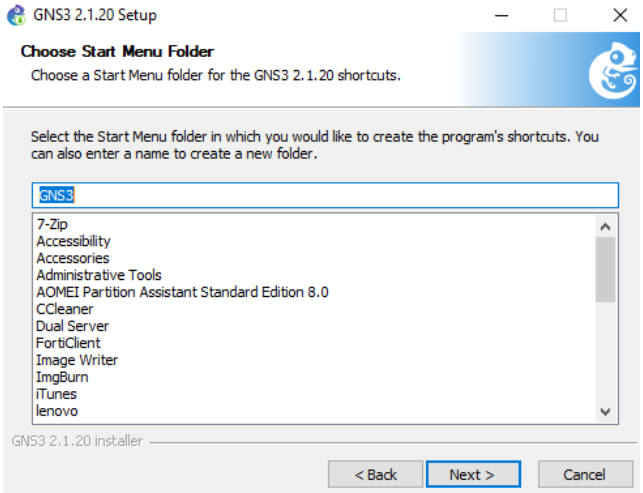

Here we are ensuring that first adapter will be on the same network as the loopback interface. It will be clearer as we dot the GNS3 configuration.

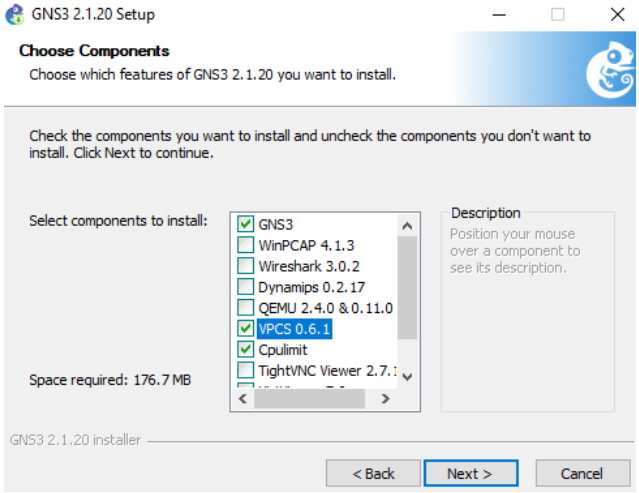
Save all the changes you have made and don't power up the host from VirtualBox, we'll do all that from GNS3.

# 5 GNS3 Installation

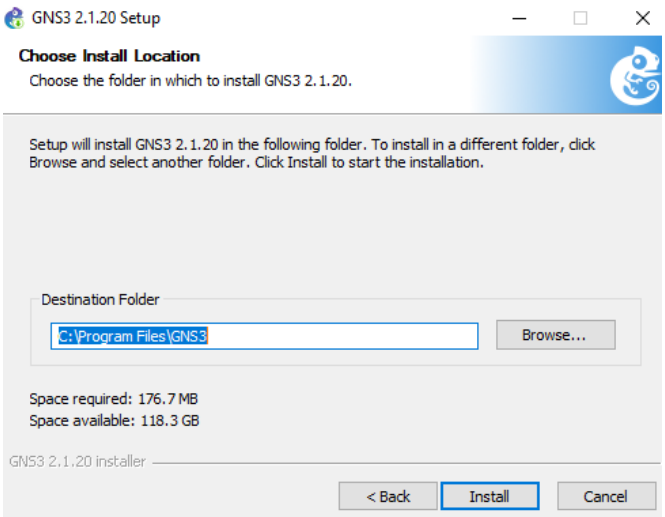
Here we'll install GNS3 and since we are using windows platform, you get many options that needs to be covered here.

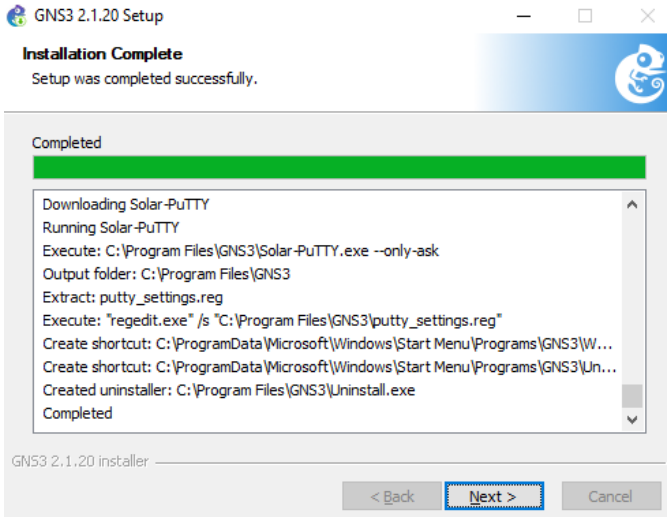



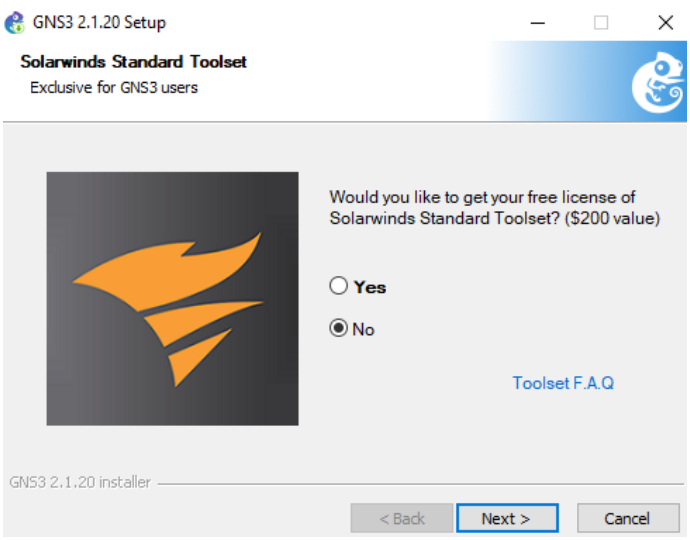



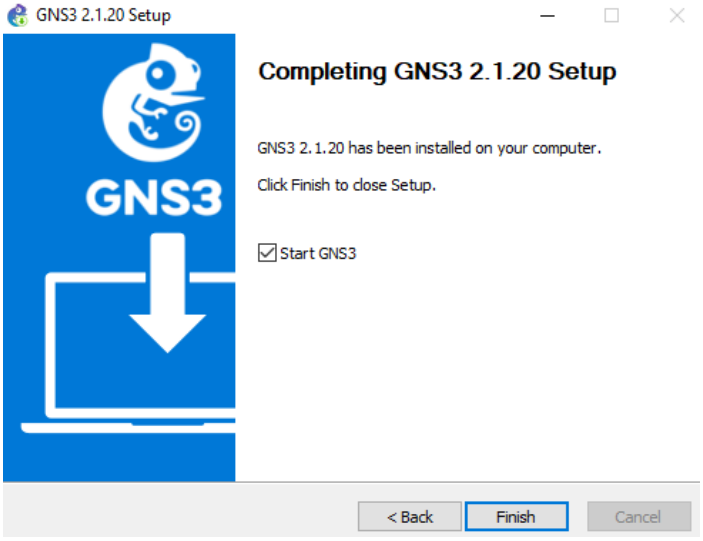




I choose the above extra bits, VPCS, Cpulimit and SolarPutty. None of them are mandatory but with these you can get added benefits, for example with solar putty, it gives you a tabbed putty session which can be very handy.



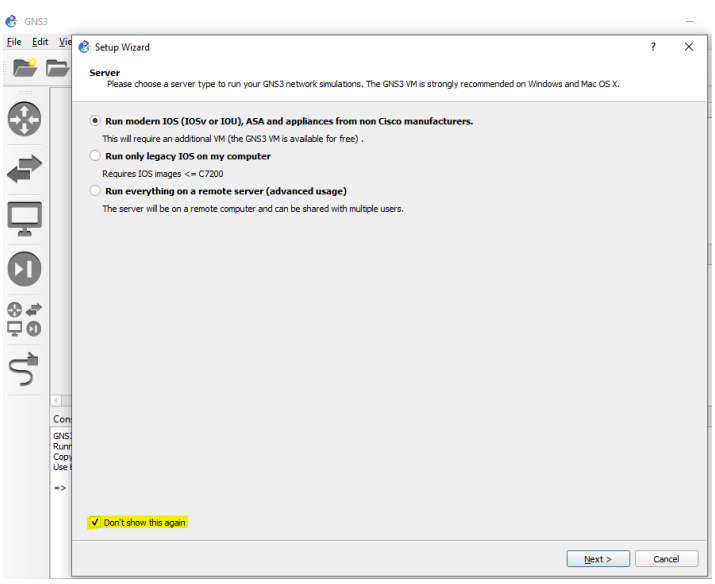



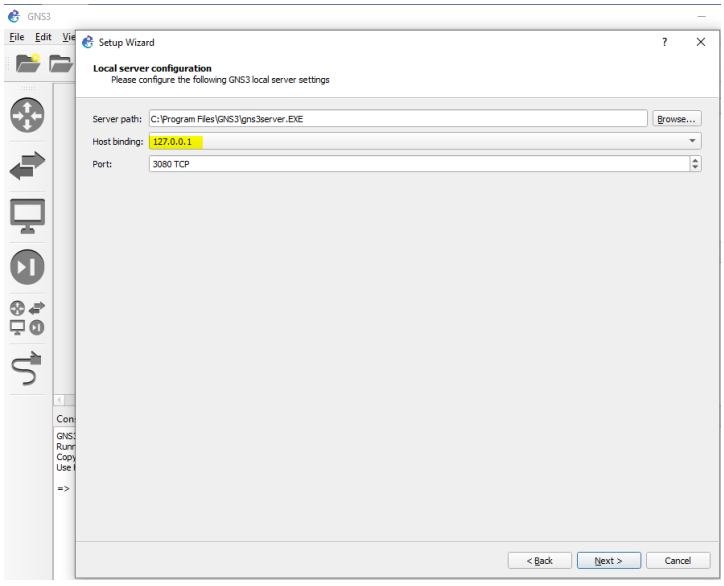


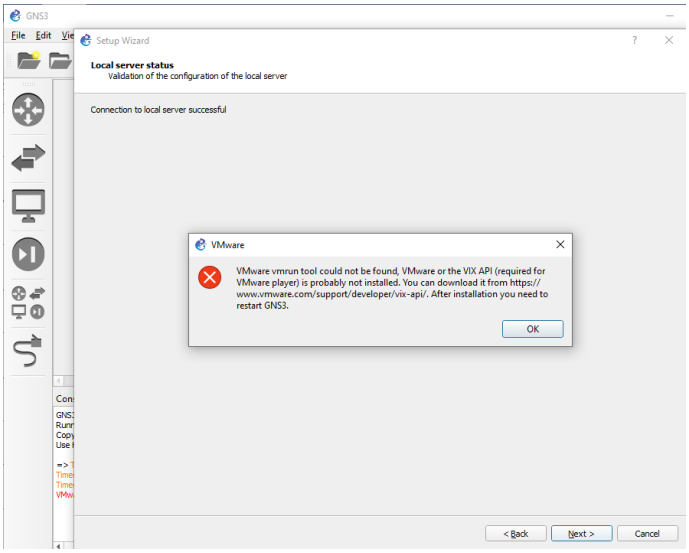

## 5.1 GNS3 Configuration

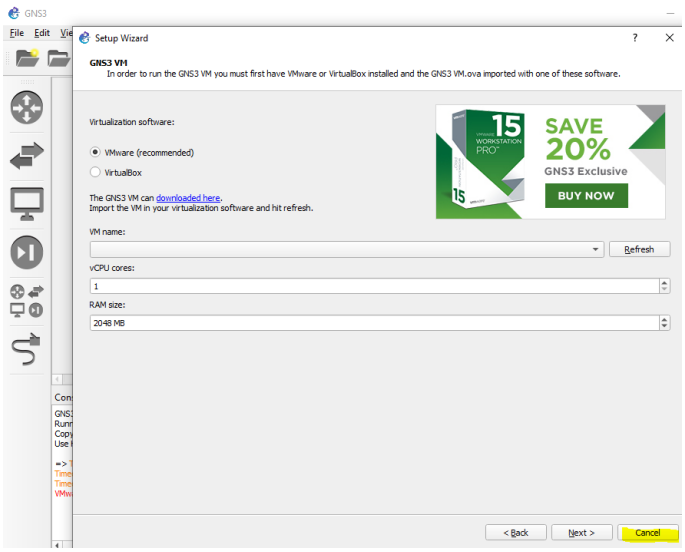
When GNS3 is started, you get this window.



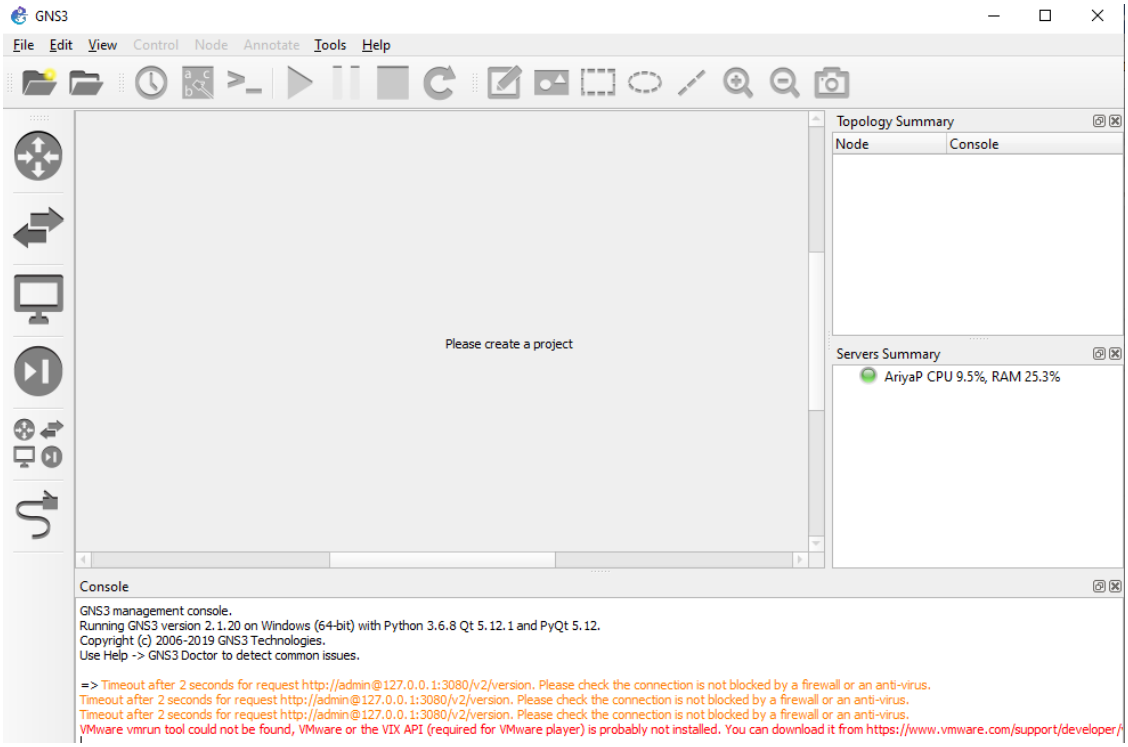




Then you get that the connection is successful but you get this error, click ok and the cancel out of it.

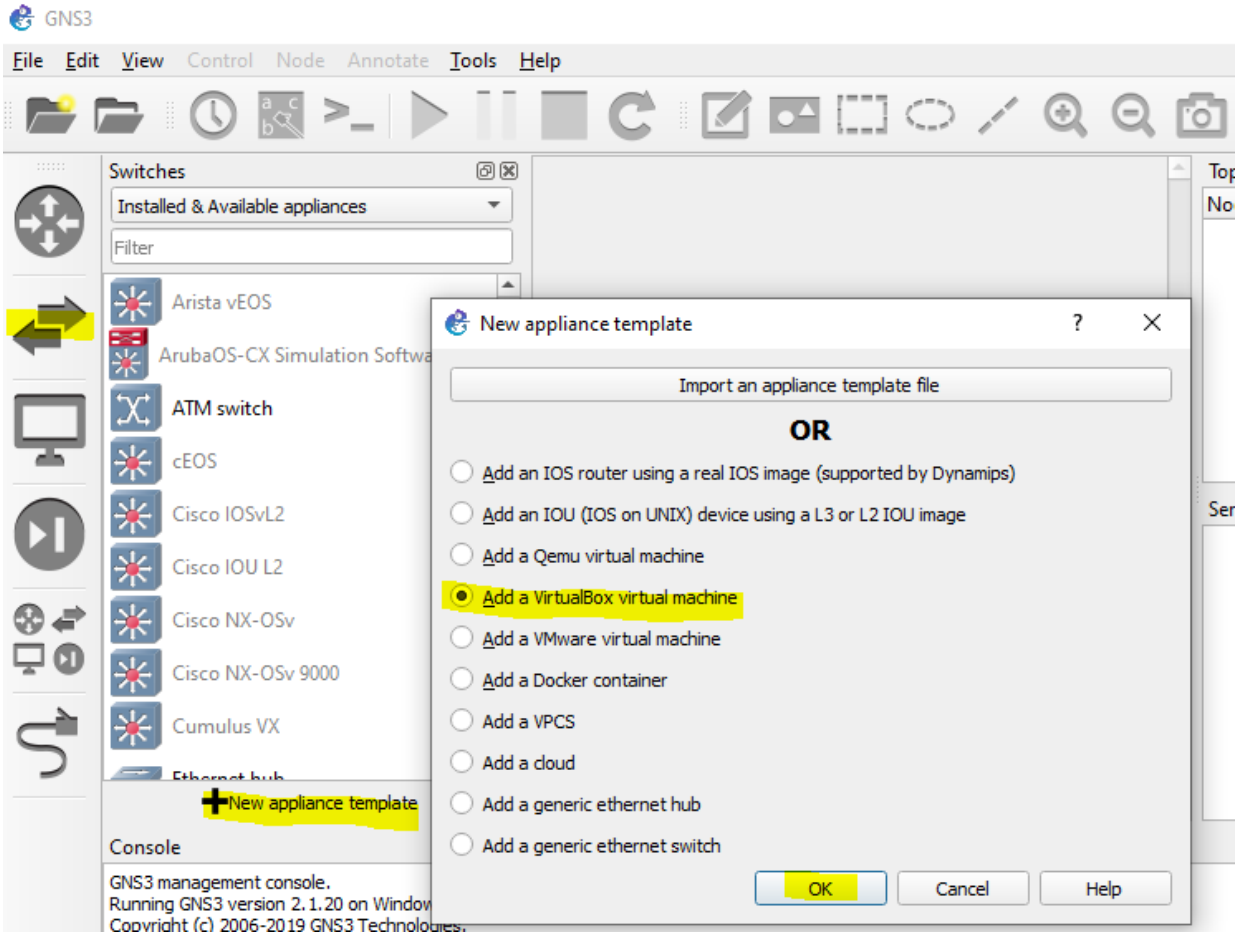


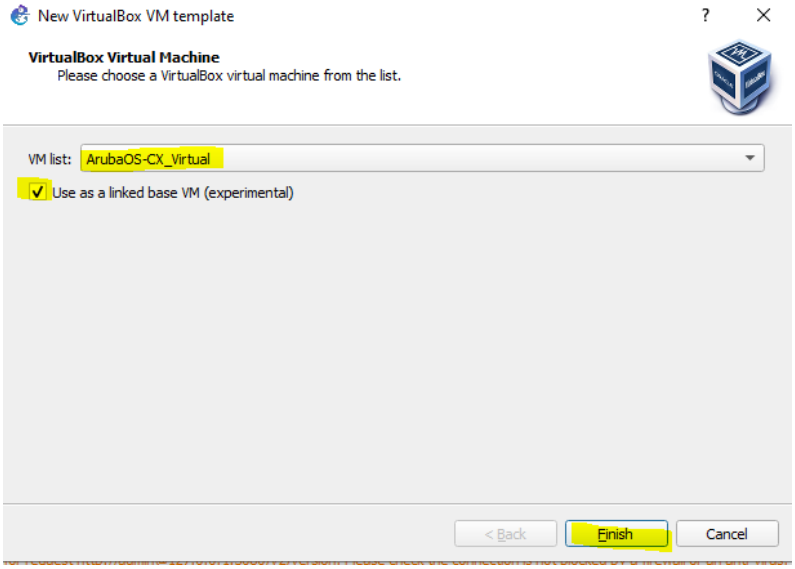




Then this is our final windows before we can start.

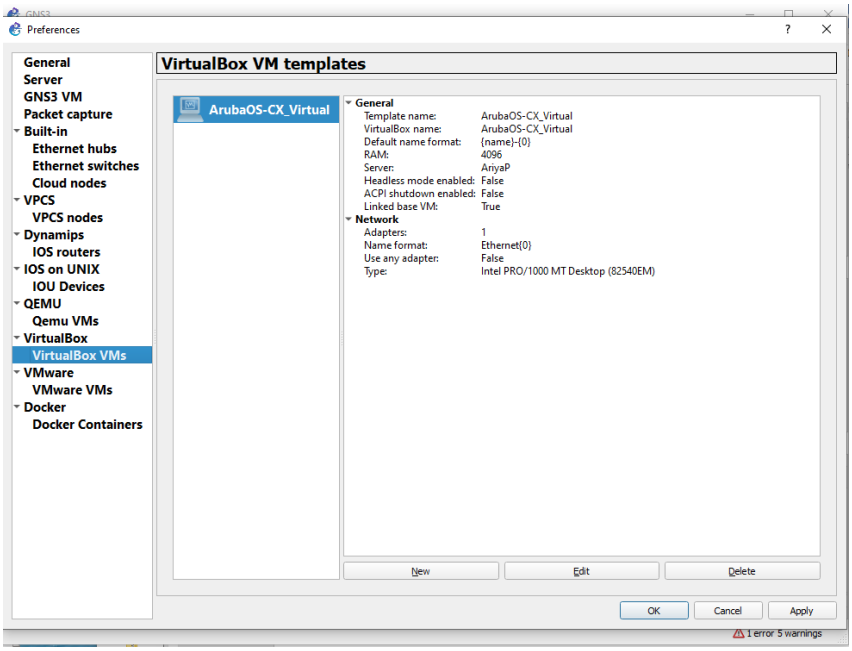


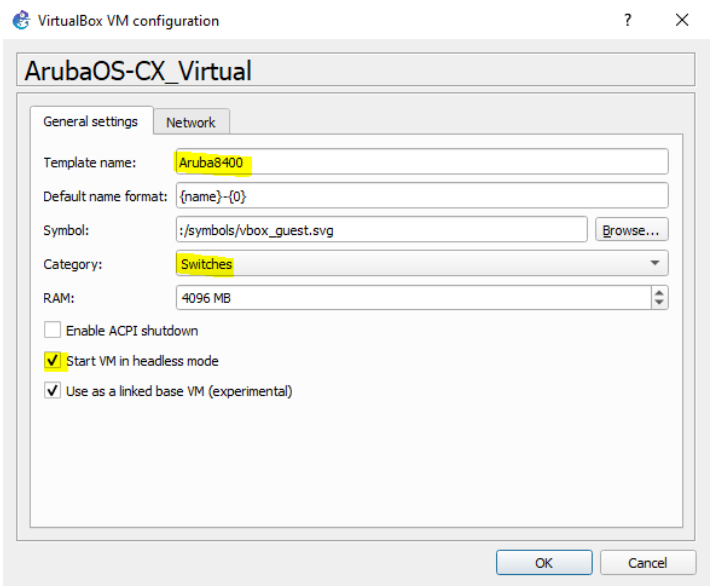

Now we want to create a new virtual appliance to represent Aruba CX switches.

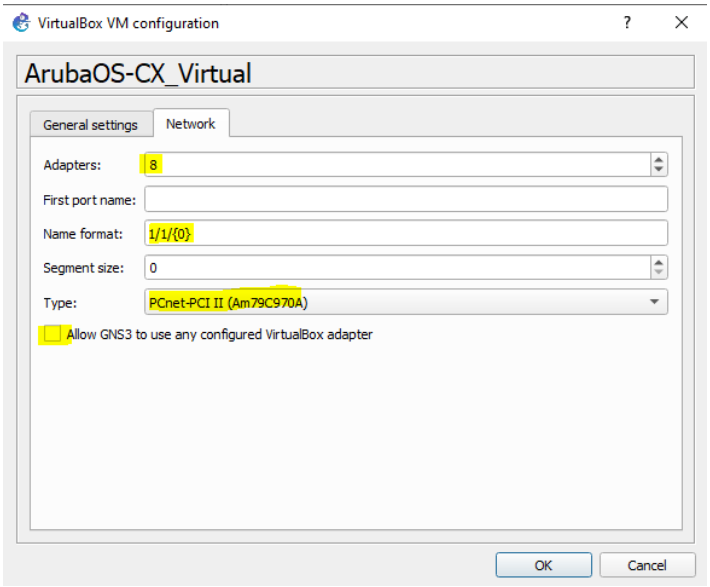





Then once you click on finish button, you are presented with the ArubaOS-CX template that needs to be edited.

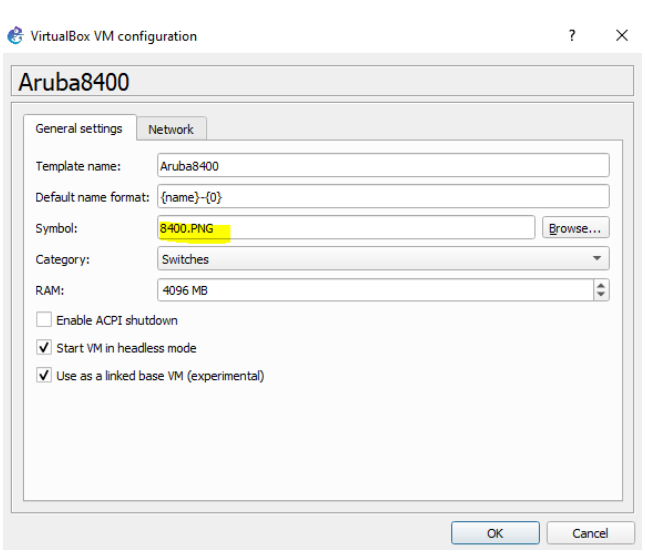


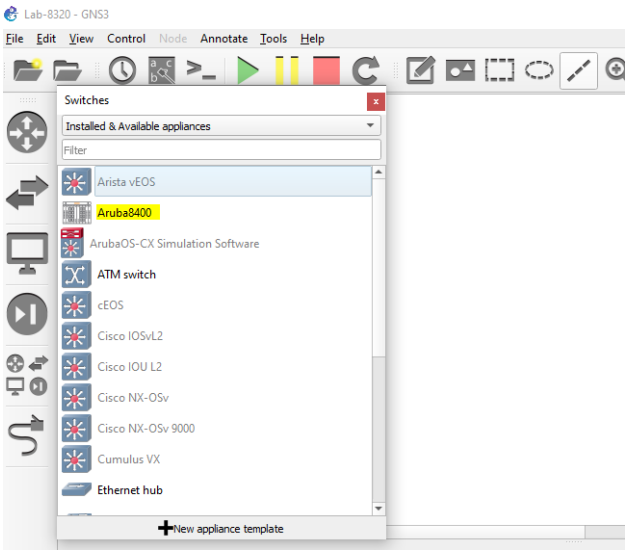



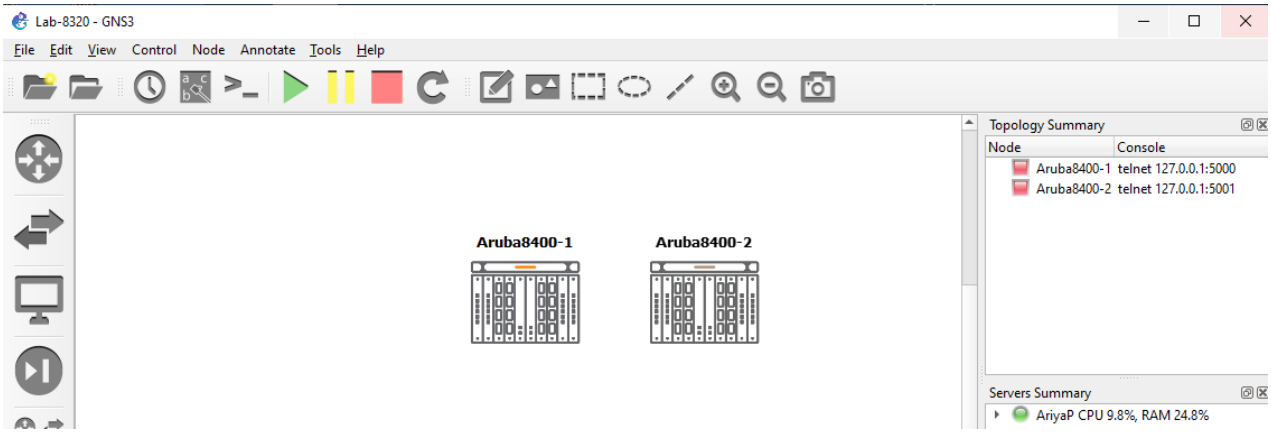

Note the changes we have made to the template, now apply and save it.

We can also change the symbol to an Aruba 8400 icon, this is what I have done.

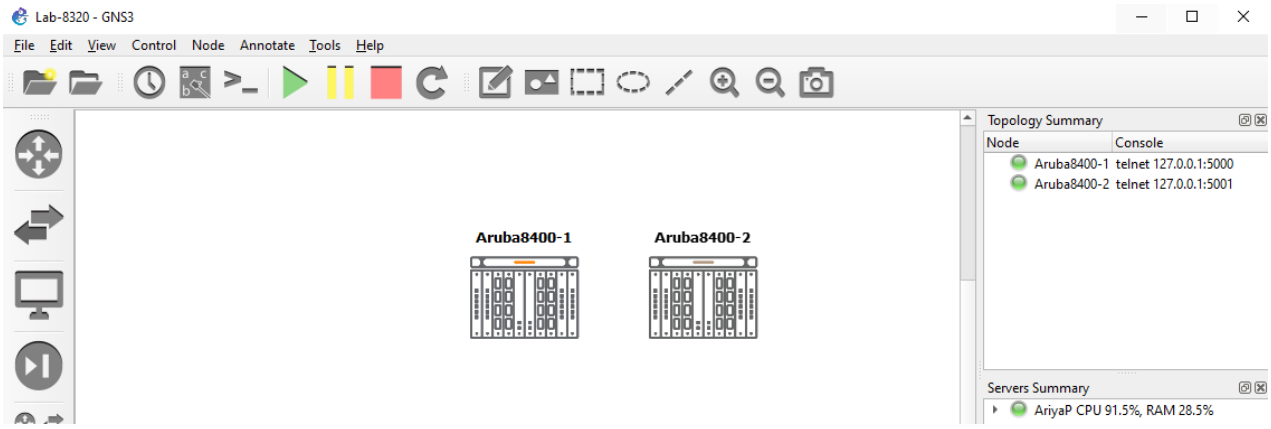



Next we'll drag and drop the Aruba 8400 switch to our new project as shown below.




Now we'll powered them on.




Next we'll open a console connection to both to configure their OOBM ports. You can double click on both the switches and that will open a solarwinds putty tabbed session.


We are going to assign 192.168.99.1/24 and 192.168.99.2/24 to the switches.

```
hostname 8400-1
interface mgmt
    no shutdown
    ip static 192.168.99.1/24
    default-gateway 192.168.99.254
https-server rest access-mode read-write
https-server vrf mgmt
ssh server vrf mgmt

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

hostname 8400-2
interface mgmt
    no shutdown
    ip static 192.168.99.2/24
    default-gateway 192.168.99.254
https-server rest access-mode read-write
https-server vrf mgmt
ssh server vrf mgmt
```

Note that the IP addressing is on the same IP subnet as that of our laptop loopback interface.

```
8400-1# sh int mgmt
  Address Mode                  : static
  Admin State                   : up
  Mac Address                   : 08:00:27:29:2f:f5
  IPv4 address/subnet-mask      : 192.168.99.1/24
  Default gateway IPv4          : 192.168.99.254
  IPv6 address/prefix           :
  IPv6 link local address/prefix:
  Default gateway IPv6          :
  Primary Nameserver            :
  Secondary Nameserver          :
8400-1#

8400-2# sh int mgmt
  Address Mode                  : static
  Admin State                   : up
  Mac Address                   : 08:00:27:81:f8:1b
  IPv4 address/subnet-mask      : 192.168.99.2/24
```

```
  Default gateway IPv4           : 192.168.99.254
  IPv6 address/prefix            :
  IPv6 link local address/prefix: fe80::a00:27ff:fe81:f81b/64
  Default gateway IPv6           :
  Primary Nameserver             :
  Secondary Nameserver           :
8400-2#
```

Now we should have full connectivity to the switches and should be able to ping them from our laptop.

```
C:\>ping 192.168.99.1

Pinging 192.168.99.1 with 32 bytes of data:
Reply from 192.168.99.1: bytes=32 time<1ms TTL=64
Reply from 192.168.99.1: bytes=32 time<1ms TTL=64
Reply from 192.168.99.1: bytes=32 time<1ms TTL=64
Reply from 192.168.99.1: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.99.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.99.2

Pinging 192.168.99.2 with 32 bytes of data:
Reply from 192.168.99.2: bytes=32 time<1ms TTL=64
Reply from 192.168.99.2: bytes=32 time<1ms TTL=64
Reply from 192.168.99.2: bytes=32 time<1ms TTL=64
Reply from 192.168.99.2: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.99.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

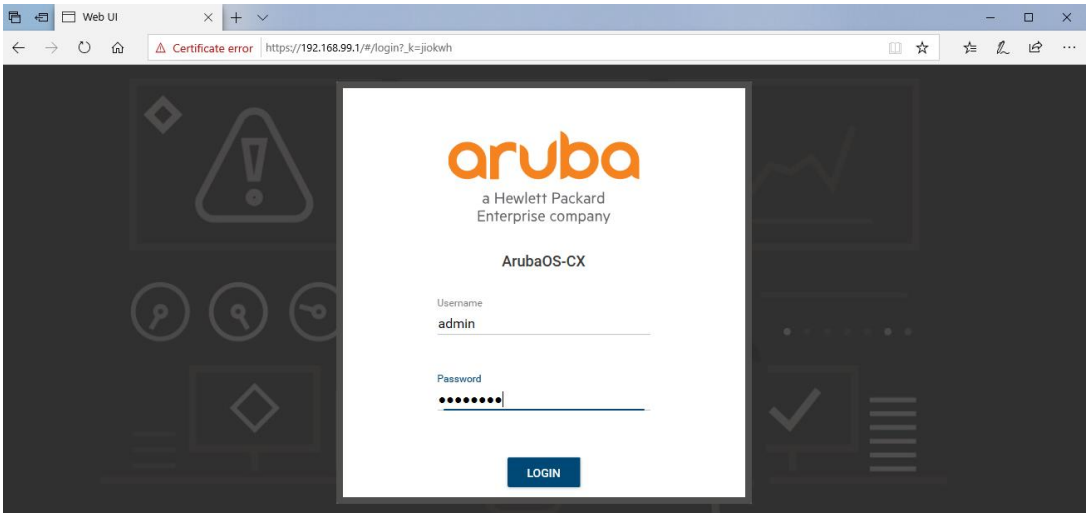
And the same from the virtual switches.

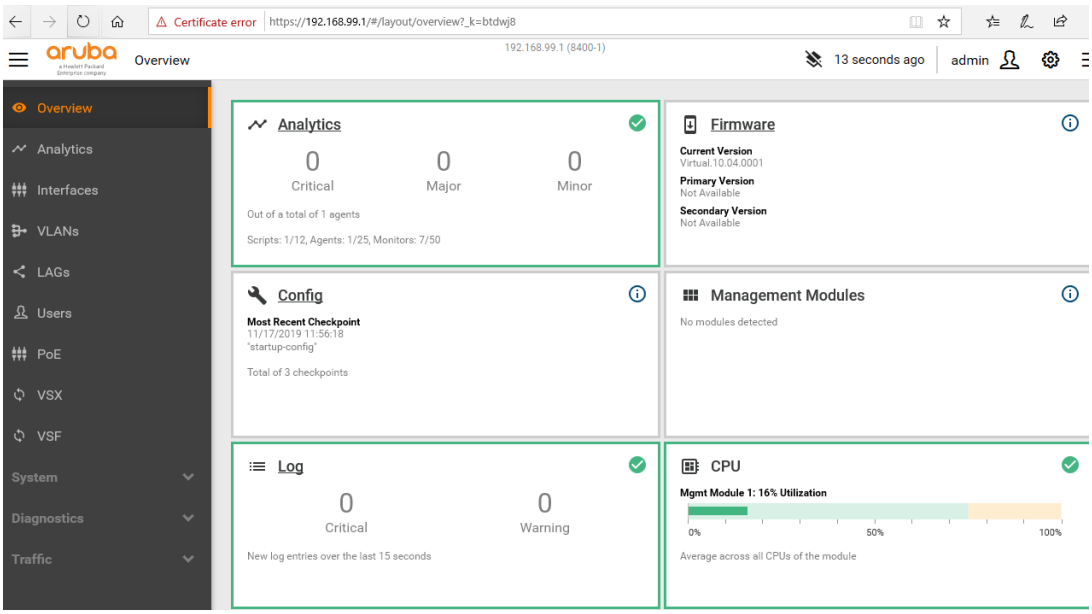
```
8400-1# ping 192.168.99.254 vrf mgmt
PING 192.168.99.254 (192.168.99.254) 100(128) bytes of data.
108 bytes from 192.168.99.254: icmp_seq=1 ttl=128 time=1.49 ms
108 bytes from 192.168.99.254: icmp_seq=2 ttl=128 time=0.325 ms
108 bytes from 192.168.99.254: icmp_seq=3 ttl=128 time=0.408 ms
108 bytes from 192.168.99.254: icmp_seq=4 ttl=128 time=0.254 ms
108 bytes from 192.168.99.254: icmp_seq=5 ttl=128 time=0.463 ms

--- 192.168.99.254 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 0.254/0.589/1.495/0.458 ms

8400-1# ping 192.168.99.2 vrf mgmt
PING 192.168.99.2 (192.168.99.2) 100(128) bytes of data.
108 bytes from 192.168.99.2: icmp_seq=1 ttl=64 time=0.558 ms
108 bytes from 192.168.99.2: icmp_seq=2 ttl=64 time=0.596 ms
108 bytes from 192.168.99.2: icmp_seq=3 ttl=64 time=0.563 ms
108 bytes from 192.168.99.2: icmp_seq=4 ttl=64 time=0.481 ms
108 bytes from 192.168.99.2: icmp_seq=5 ttl=64 time=0.447 ms

--- 192.168.99.2 ping statistics ---
```

```
5 packets transmitted, 5 received, 0% packet loss, time 4004ms
rtt min/avg/max/mdev = 0.447/0.529/0.596/0.055 ms
8400-1#

8400-2# ping 192.168.99.1 vrf mgmt
PING 192.168.99.1 (192.168.99.1) 100(128) bytes of data.
108 bytes from 192.168.99.1: icmp_seq=1 ttl=64 time=1.05 ms
108 bytes from 192.168.99.1: icmp_seq=2 ttl=64 time=0.783 ms
108 bytes from 192.168.99.1: icmp_seq=3 ttl=64 time=0.443 ms
108 bytes from 192.168.99.1: icmp_seq=4 ttl=64 time=0.544 ms
108 bytes from 192.168.99.1: icmp_seq=5 ttl=64 time=0.629 ms

--- 192.168.99.1 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4100ms
rtt min/avg/max/mdev = 0.443/0.689/1.050/0.214 ms
8400-2#
```

## 5.2 CX Switch WebUI Access

Now that we have the management interface up and running on the CX switches, we should also have full webUI access.




Note that because we were using bridged Adapter in VirtualBox VM setting for Adapter1, the Interface 1/1/0 of all CX switches will be connected to that loopback interface.