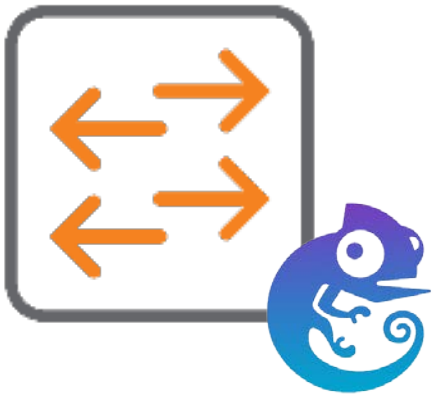
TECHNICAL WHITE PAPER

ARUBAOS-CX OVA ON GNS3 VM

USING GNS3 REMOTE VM FOR COMPLEX TOPOLOGY



Rev: April 2019

Table of Contents

Revision History

Document Version	Reason for Change	Revision Date
1.0	Initial Release	April 2019

Introduction

The ArubaOS-CX Simulation Software OVA is a virtual platform to enable simulation of the ArubaOS-CX Network Operating System. Simulated networks can be created using many of the protocols in the ArubaOS-CX operating system like OSPF and BGP. Key features like VSX, Aruba Network Analytics Engine and the REST API can be simulated, providing a lightweight development platform to building the modern network. This software can be easily implemented in the GNS3 simulation software to enable drag and drop network design for building complex simulated topologies.

Using ArubaOS-CX OVA for complex topologies might require some powerful machine and is sometime not suitable on laptop which may not have enough resources to get clean CX VM behavior.

This guide explains how to use the ArubaOS-CX OVA with GNS3 remote VM running on powerful VMware ESXi server. This combination brings very responsive CX Virtual Machine which allows great efficiency in simulating networks including features like VSX, OSPF, BGP, 3-Tier network layers…

Pre-requisites

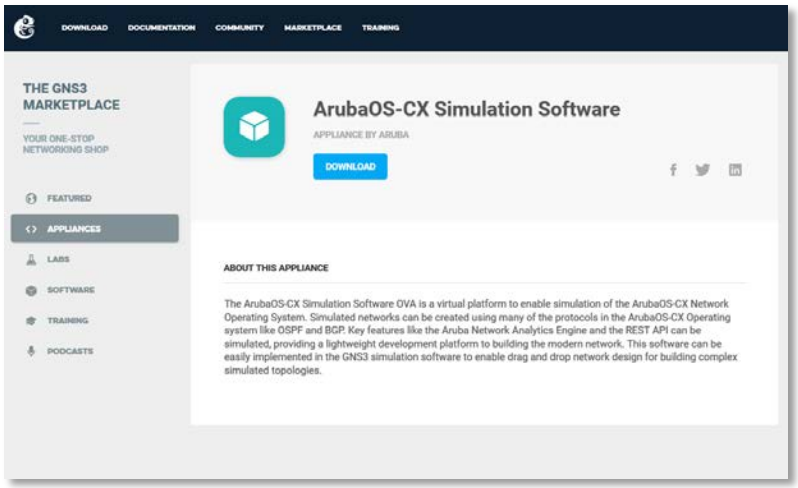
1. Please download the ArubaOS-CX OVA from here:

https://asp.arubanetworks.com/downloads/software/RmlsZTpjY2M3NjgzOC0yZTUyLTExZTktYjRkOC1iNzk5YmM1YTZmMmM%3D

2. And please refer to the release notes to understand the unsupported features:

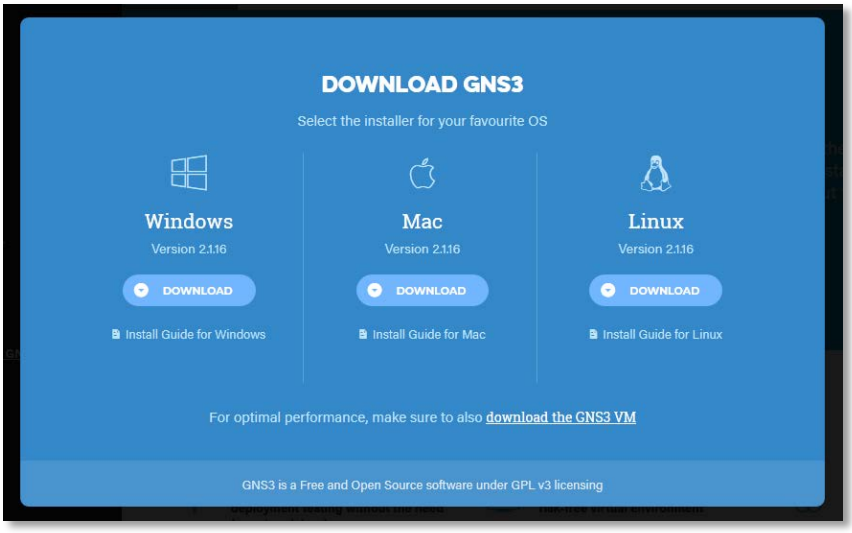
https://support.hpe.com/hpsc/doc/public/display?docId=a00065948en_us

3. Download the ArubaOS-CX GNS3 appliance:
   You may see AubaOS-CX ni the GNS3 marketplace. At the time of writing this guide, this appliance is not maintained

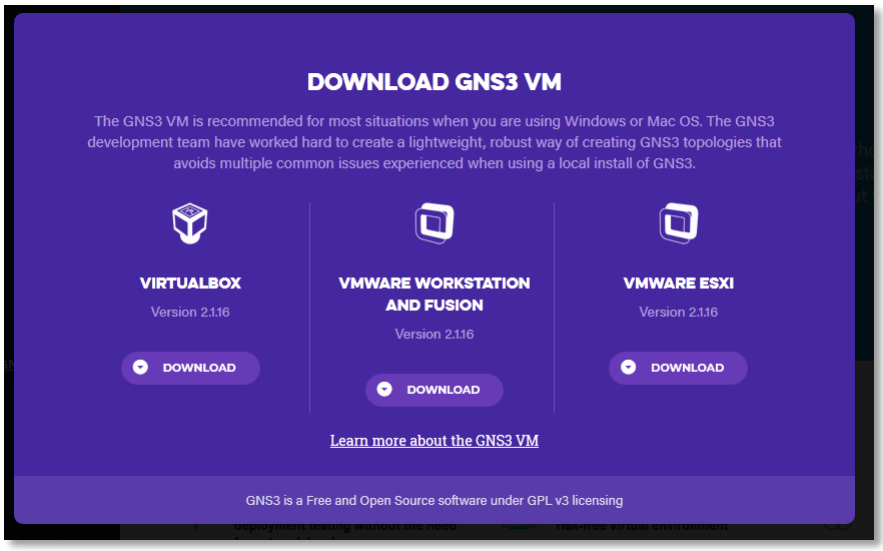


   by Aruba yet. Please download and unzip the GNS3 appliance from arubapedia instead:
   https://arubapedia.arubanetworks.com/arubapedia/index.php/File:arubaoscx_gns3a.zip

4. Download GNS3 client from
   https://www.gns3.com/
   (Version 2.1.16 at the time of that guide)



5. Download the associated GNS3 VM for VMware ESXi (recommendation: same version, here 2.1.16)
   https://www.gns3.com/software/download-vm



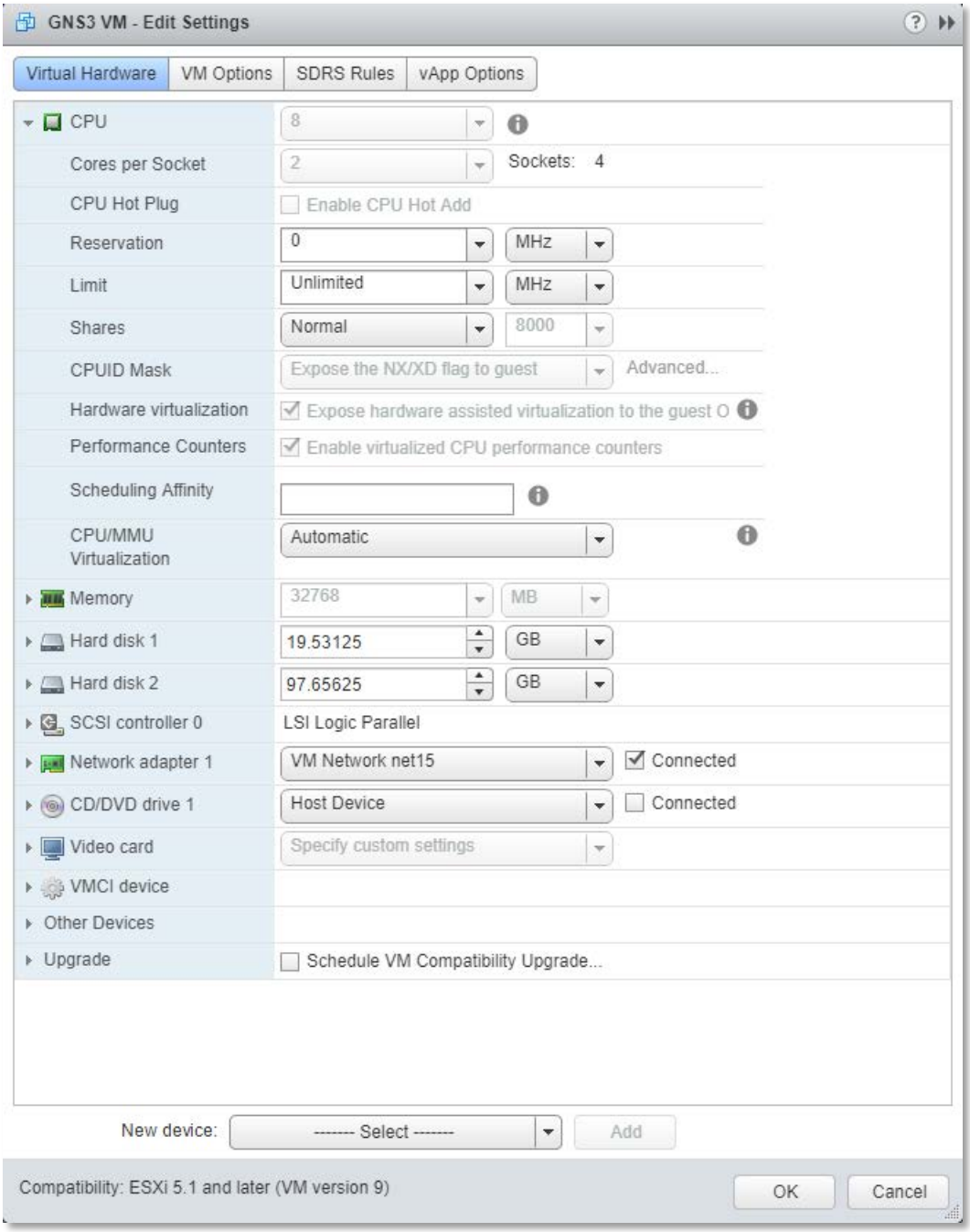
6. A laptop (Windows, MAC, Linux) having, if possible, full IP access to the subnet on which the GNS3 VM will run.
7. An ESXi 6.x server with at least 8 CPUs (ex: 4 cores with multithreading) and at least 32GB of RAM.

GNS3 Set-up

Install GNS3 VM

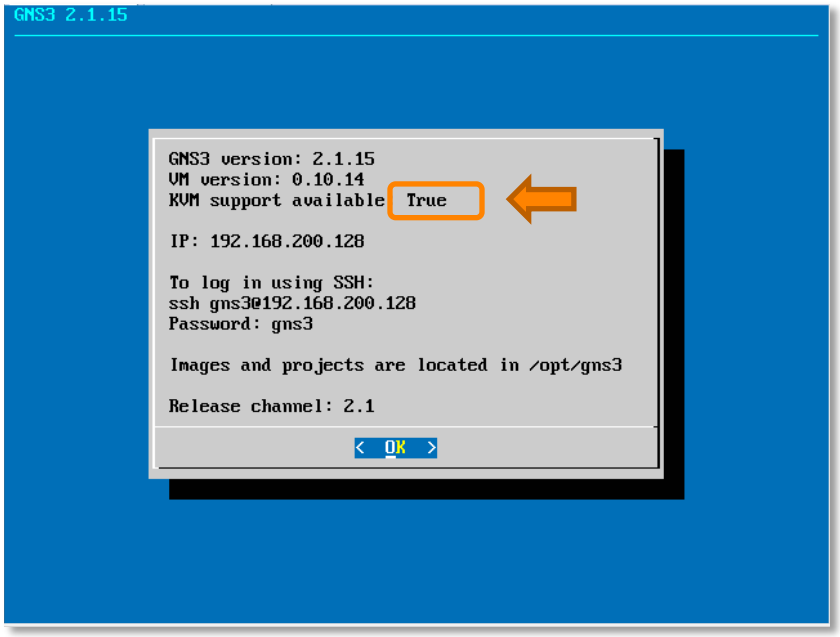
Install from vsphere or ESXi Web-UI the GNS3 VM.

Here is an example of allocated number of vCPUs and RAM.

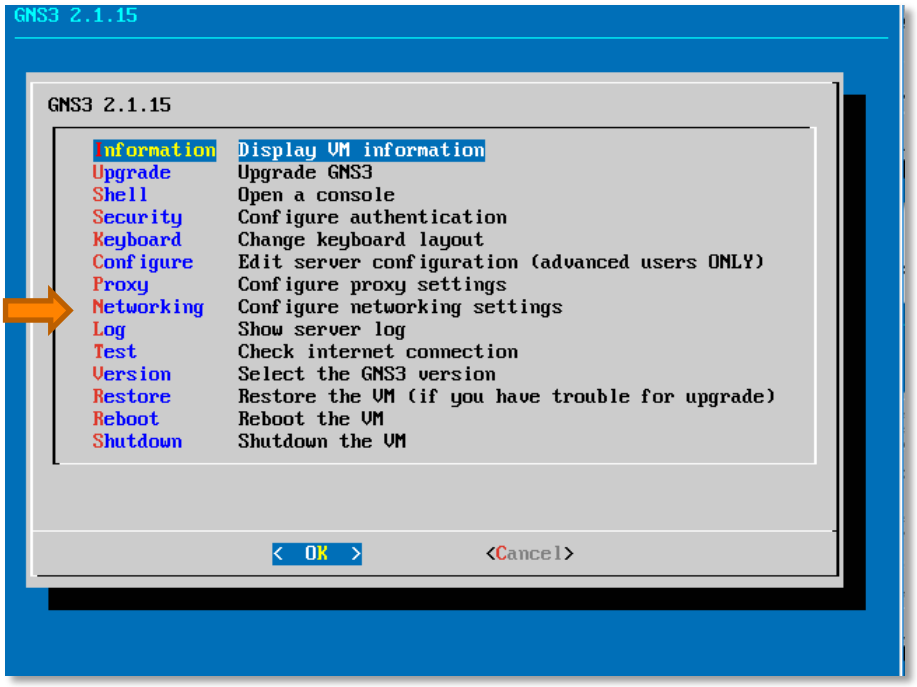


The main important point is the Hardware Virtualization which needs to be checked to expose hardware assisted virtualization to the GNS3 VM.

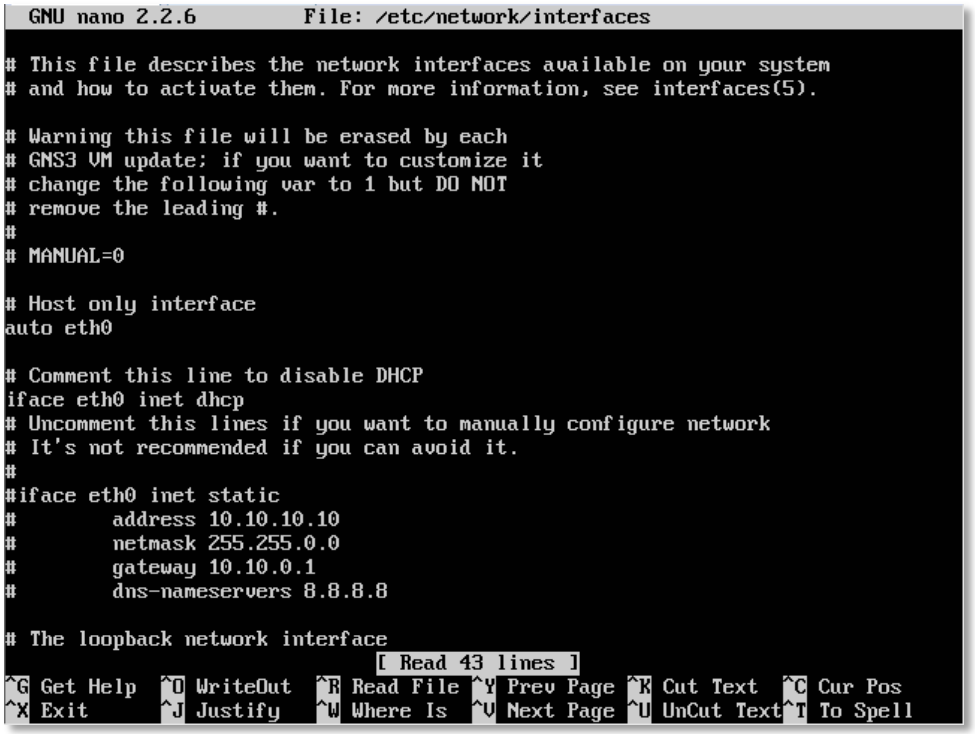
This setting is mandatory to get KVM support from GNS3 VM. Once GNS3 VM is started, you'll get this information screen:



Select "OK" and select Networking from the Menu below



Edit the /etc/network/interfaces file to set your corresponding fixed IP address.



CTRL+O to save, CTRL+X to exit.

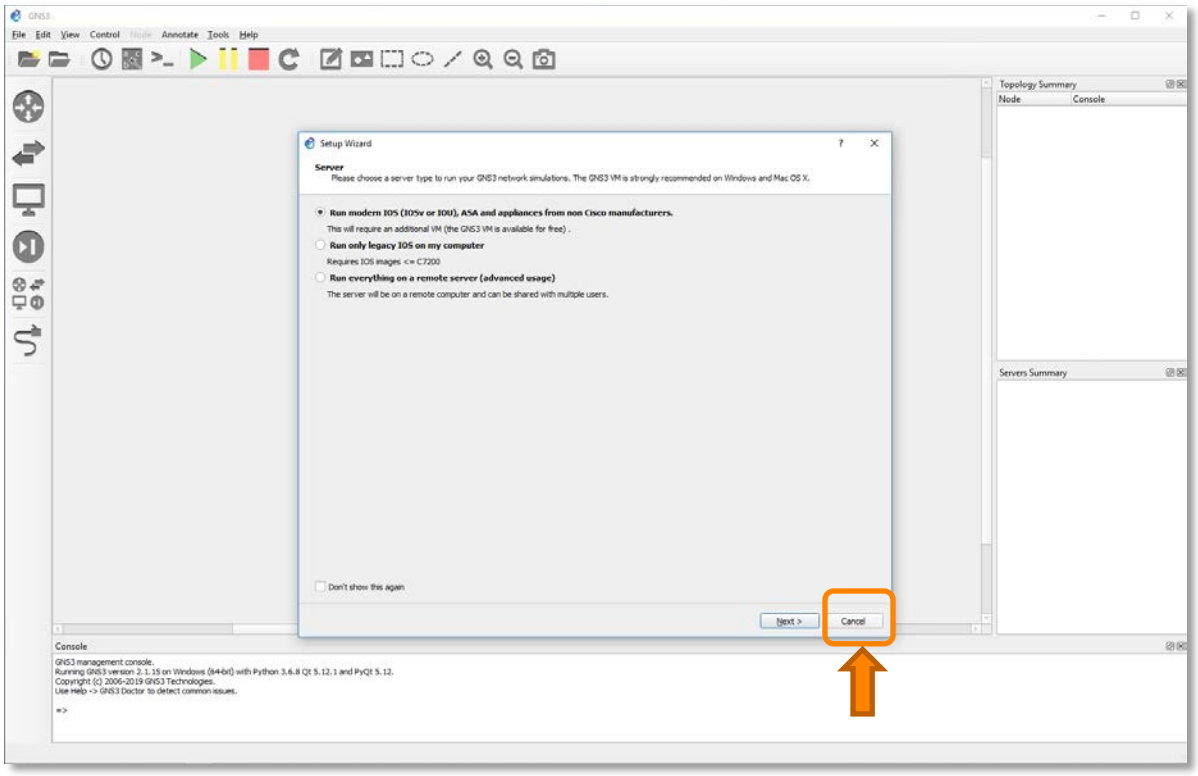
On Exit the GNS3 VM will restart and is ready to use.

The default username and password of the GNS3 VM are: gns3 / gns3. SSH can be used to access the VM if needed and to change the password of gns3 username (using sudo passwd).

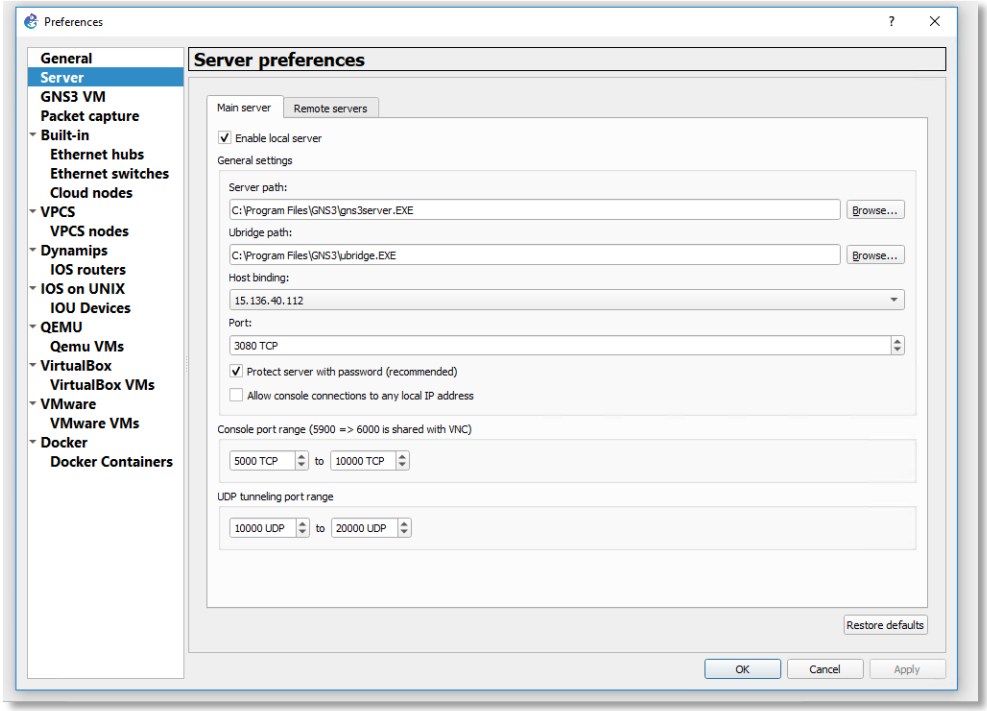
Install GNS3 Client

Perform regular installation of GNS3 on your prefer client platform.

Start GNS3 Client. As an example here is GNS3 running on Windows10:

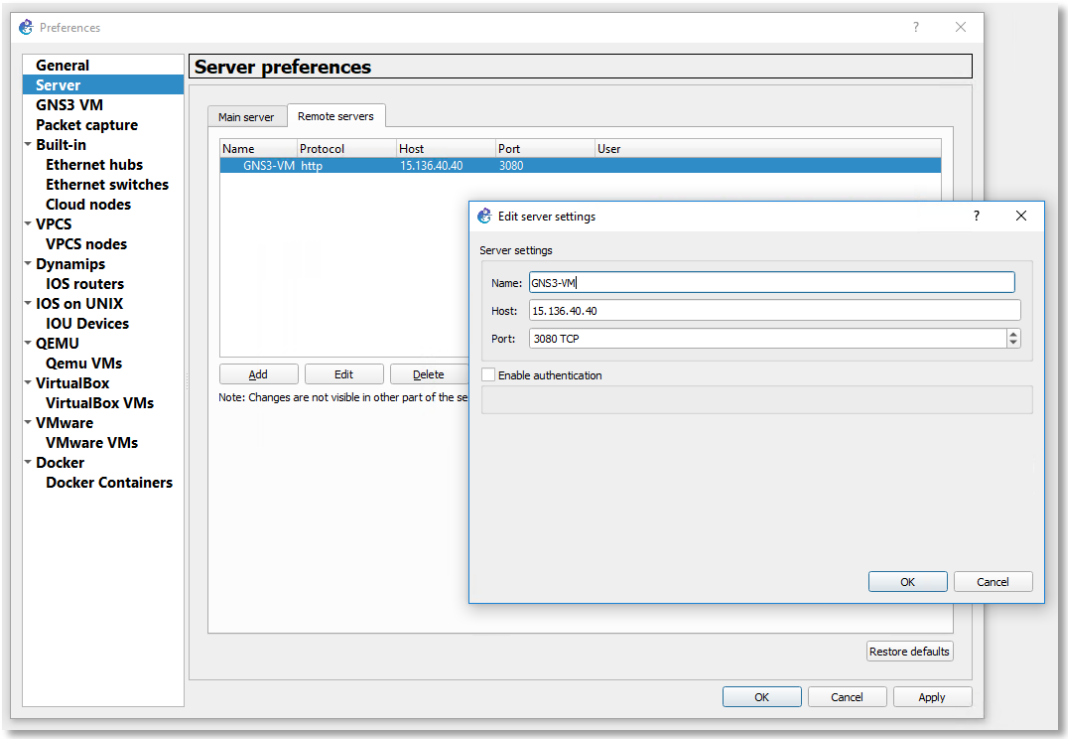


You may skip the set-up wizard and go to Edit/Preferences, Main Server and Enable local server (for any reason having a local server is a must)



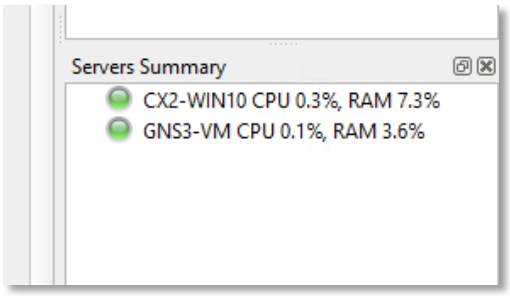
Host binding can be the loopback address 127.0.0.1.

Then go to the Remote Servers tab and enter the information of your remote GNS3 VM:



Authentication (that can be enabled) was not successfully tested.

Once apply, 2 green GNS3 servers should appear in the Serves Summary Tile of the GNS3 Client: the local and the remote.



ArubaOS-CX OVA set-up in GNS3

ArubaOS-CX GNS3 Appliance

The ArubaOS-CX GNS3 appliance is combination of a descriptor file .gns3a and a disk .vmdk file.

Here is the arubaoscx.gns3a:

```
{
    "name": "ArubaOS-CX Simulation Software",
    "category": "multilayer_switch",
    "status": "stable",
    "product_name": "ArubaOS-CX Simulation Software",
    "description": "The ArubaOS-CX Simulation Software OVA is a virtual platform to enable simulation of
the ArubaOS-CX Network Operating System. Simulated networks can be created using many of the protocols in
the ArubaOS-CX Operating system like OSPF and BGP. Key features like the Aruba Network Analytics Engine
and the REST API can be simulated, providing a lightweight development platform to building the modern
network. This software can be easily implemented in the GNS3 simulation software to enable drag and drop
network design for building complex simulated topologies.",
    "maintainer_email": "TBD",
    "vendor_url": "arubanetworks.com",
    "vendor_name": "HPE Aruba",
    "availability": "service-contract",
    "maintainer": "TBD",
    "registry_version": 4,
    "usage": "Default username admin with blank password.",
    "symbol": ":/symbols/route_switch_processor.svg",
    "first_port_name": "",
    "port_name_format": "1/1/{0}",

    "qemu": {
        "arch": "x86_64",
        "ram": 4096,
        "adapters": 8,
        "hdb_disk_interface": "ide",
        "hdc_disk_interface": "ide",
        "hda_disk_interface": "ide",
        "cpus": 2,
        "kvm": "require",
        "adapter_type": "virtio-net-pci",
        "console_type": "vnc",
        "options": "-nographic",
        "process_priority": "normal"
    },

    "images": [
        {
            "filename": "arubaoscx-disk-image-genericx86-p4-20190129201401.vmdk",
            "version": "10.02.0010",
            "md5sum": "ac3c74eedb90d6451083ada5467271c6",
            "filesize": 287734784,
            "download_url": "http://support.arubanetworks.com/"
        }

    ],

    "versions": [
        {
            "name": "10.02.0010",
            "images": {
                "hda_disk_image": "arubaoscx-disk-image-genericx86-p4-20190129201401.vmdk"
            }
        }
    ]
```

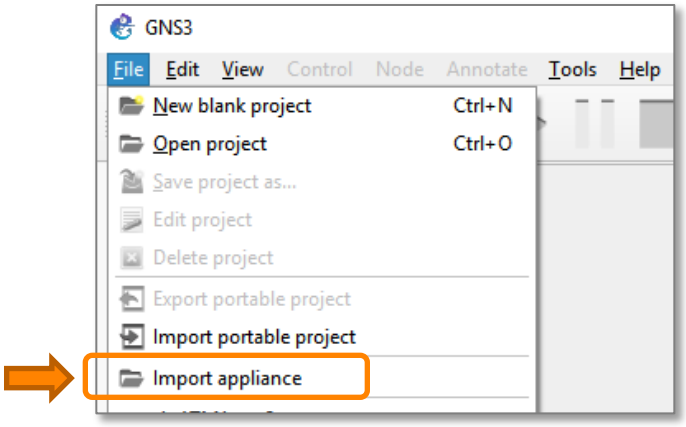
```
}
```

The .vmdk file is contains in the ArubaOS-CX OVA that is downloaded from Arubra Support Portal.

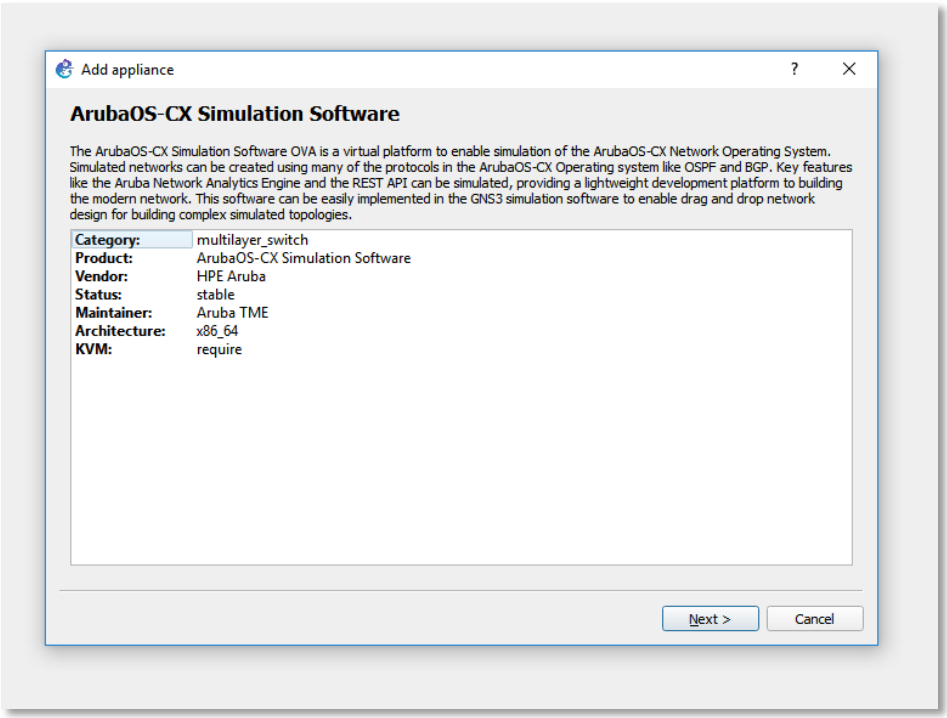
Please note that the provided gns3a file is linked to CX version. Here it is 10.02.0010. The vmdk filename, filesize and md5 signature should match the corresponding vmdk file.

Import CX Appliance in GNS3.

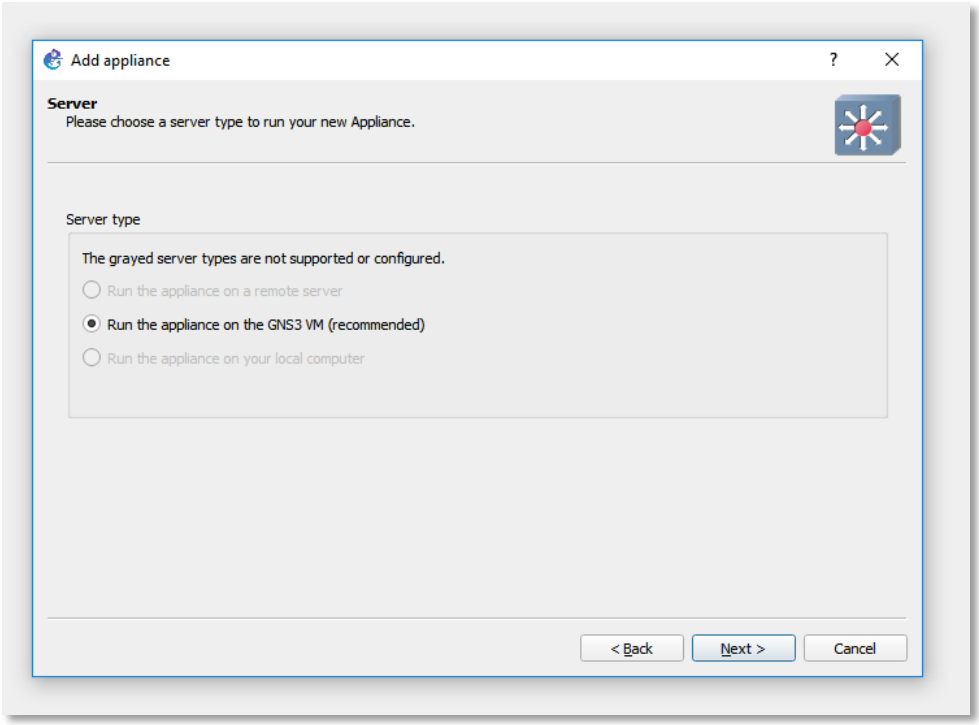
In GNS3 Client



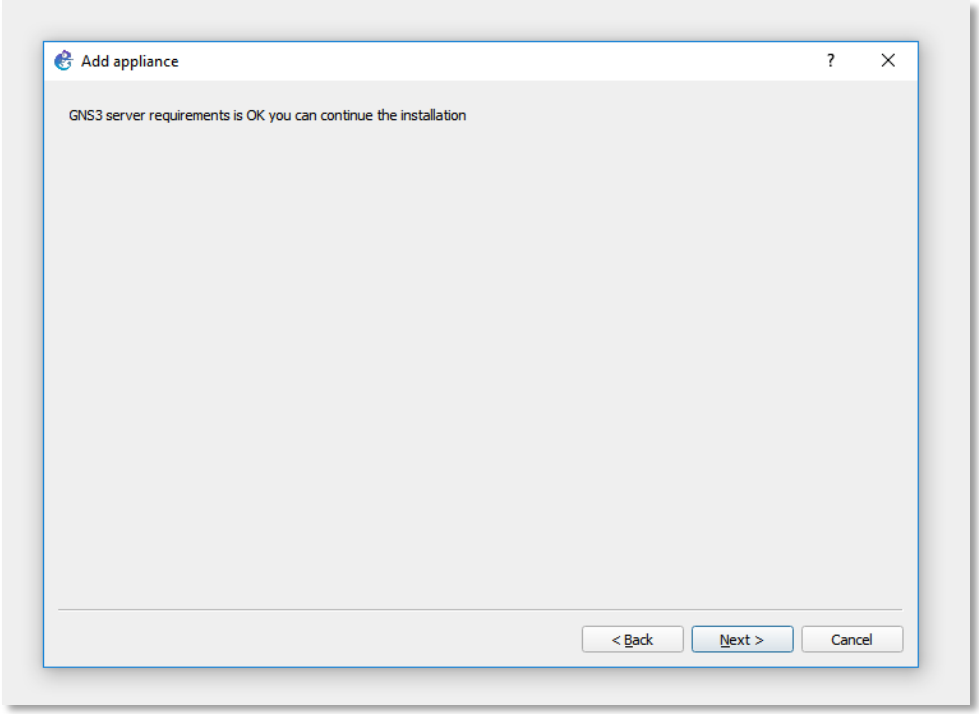
Select the GNS3 appliance file that was downloaded before (pre-requisite: arubaoxcx.gns3a).



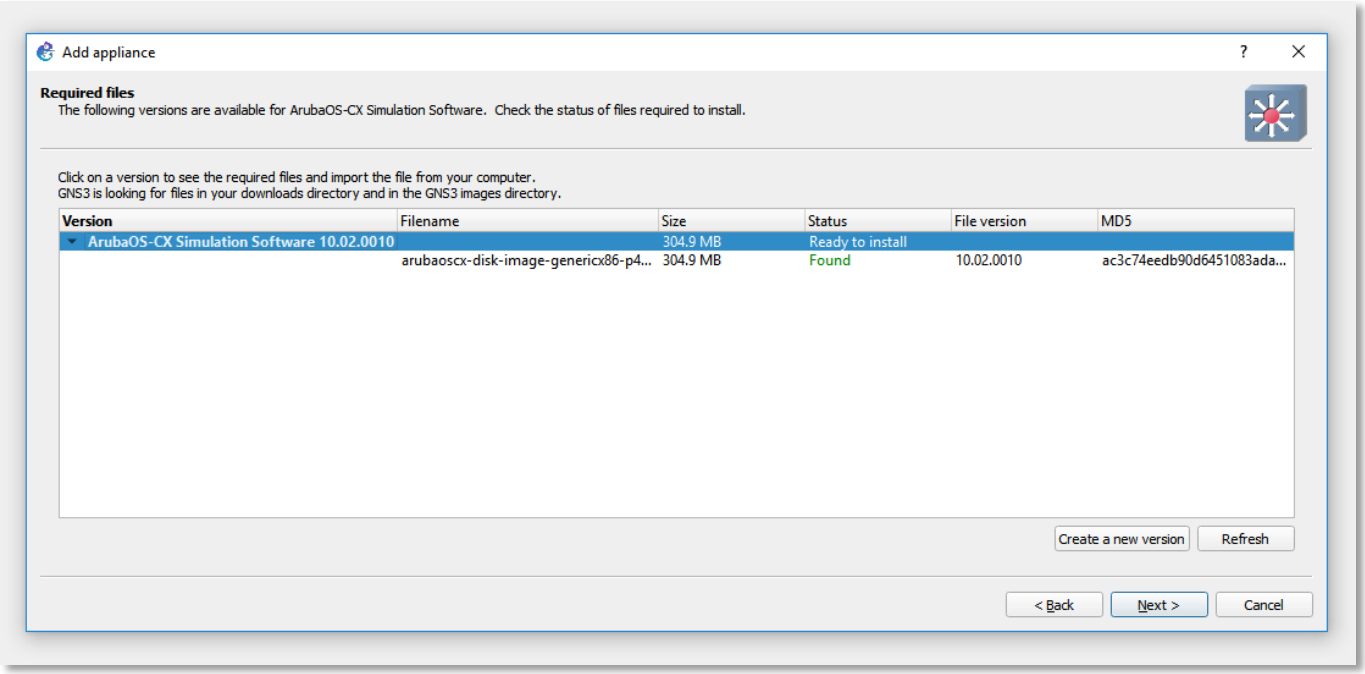
Click on Next.



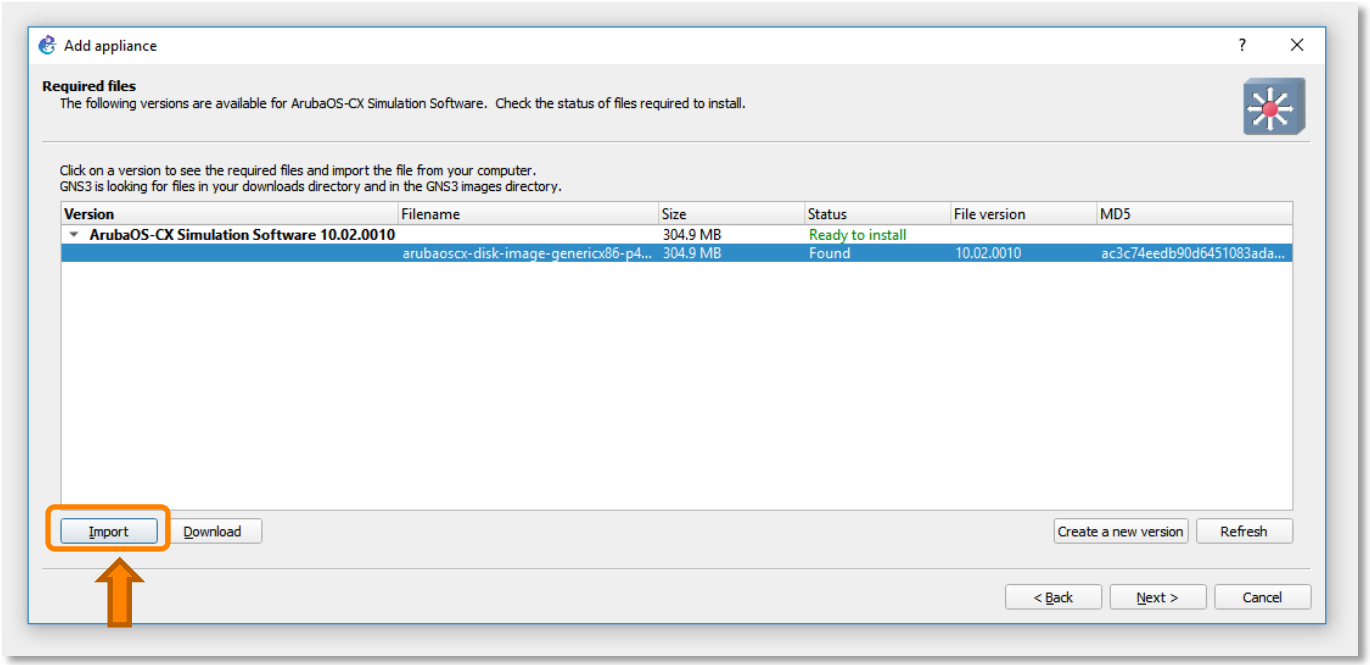
Next.



Next.



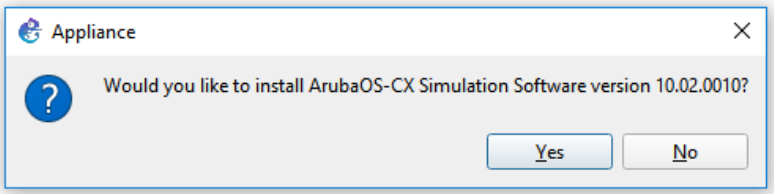
The filename might not be found as disk path is missing. If "Not Found" appears, simply import the expected file with the import button once the missing item is selected:



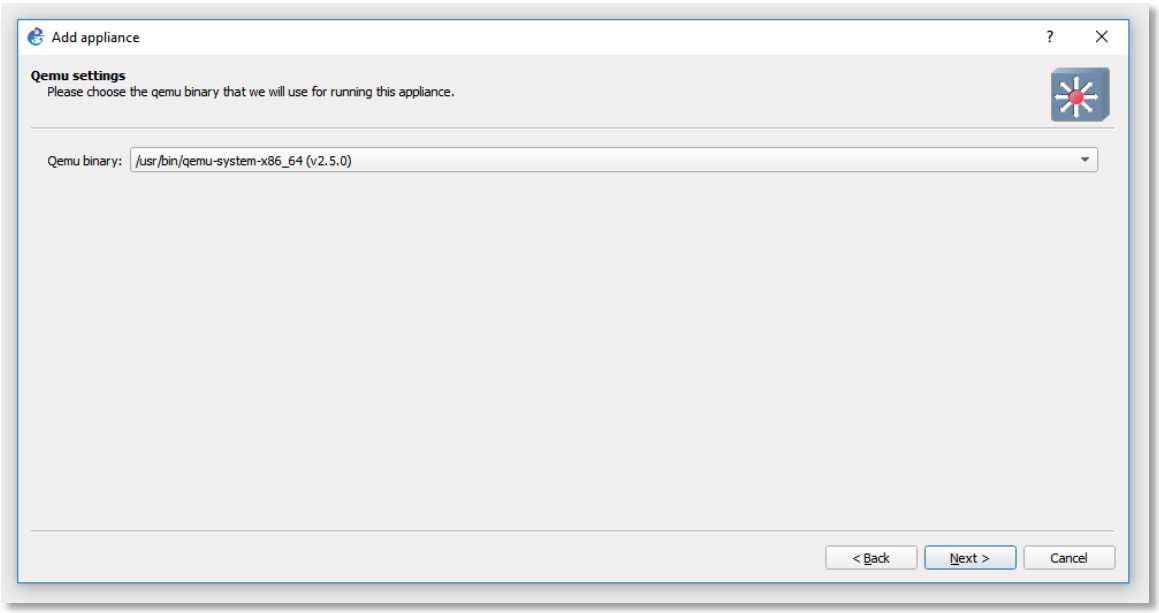
Click Import and select the proper vmdk file.
For 10.02.0010 it is: “arubaoscx-disk-image-genericx86-p4-20190129201401.vmdk”.
The .vmdk file is available in the ArubaOS-CX_10_02_0010.ova file.
The .vmdk file can be extracted from .ova file by using any zip-utility (ex: 7-Zip):

Name	Size	Packed Size	Modified	Mode	User	Group
arubaoscx-disk-image-genericx86-p4-20190129201401.ovf	9 077	9 216	2019-01-29 22:26	0rw-rw-r--	swbuildn	warp
arubaoscx-disk-image-genericx86-p4-20190129201401.vmdk	319 734 272	319 734 272	2019-01-29 22:26	0rw-r--r--	swbuildn	warp

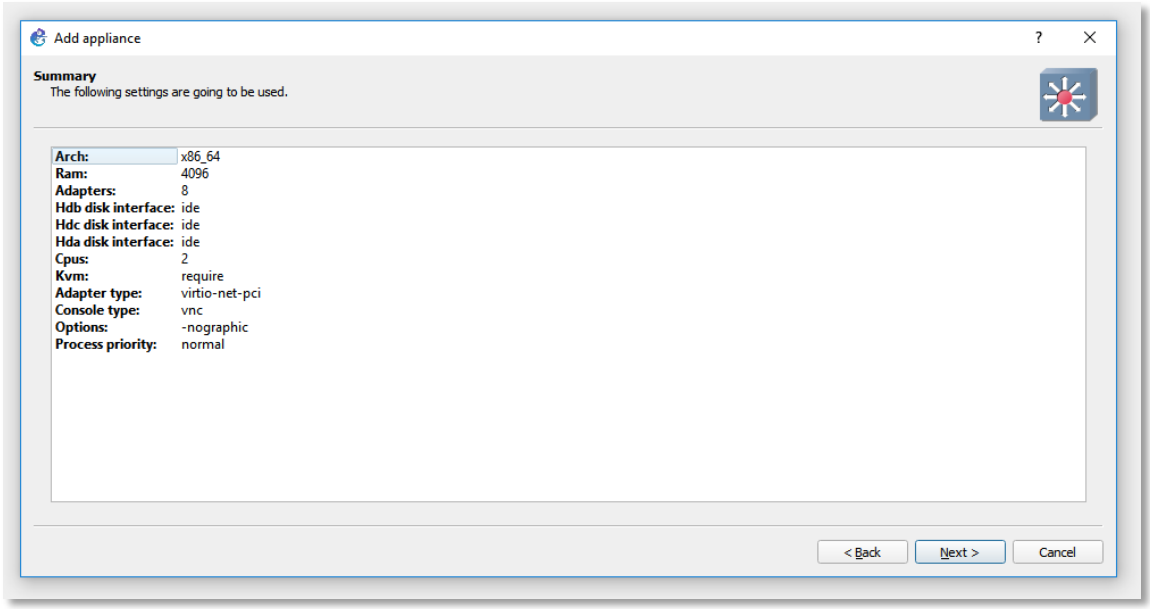
Once file selection is made:



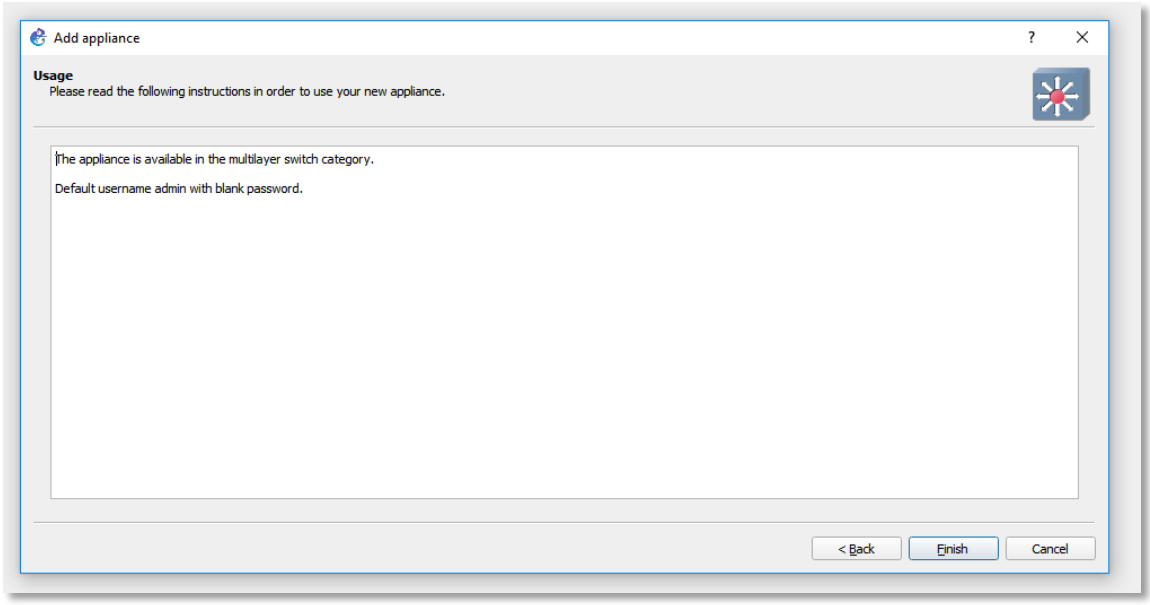
Click Yes.



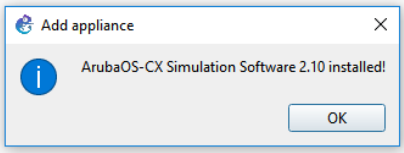
Keep the default selected Qemu (Qucik Emulator: QEMU is a generic and open source machine emulator and virtualizer).
Click Next.



Next.



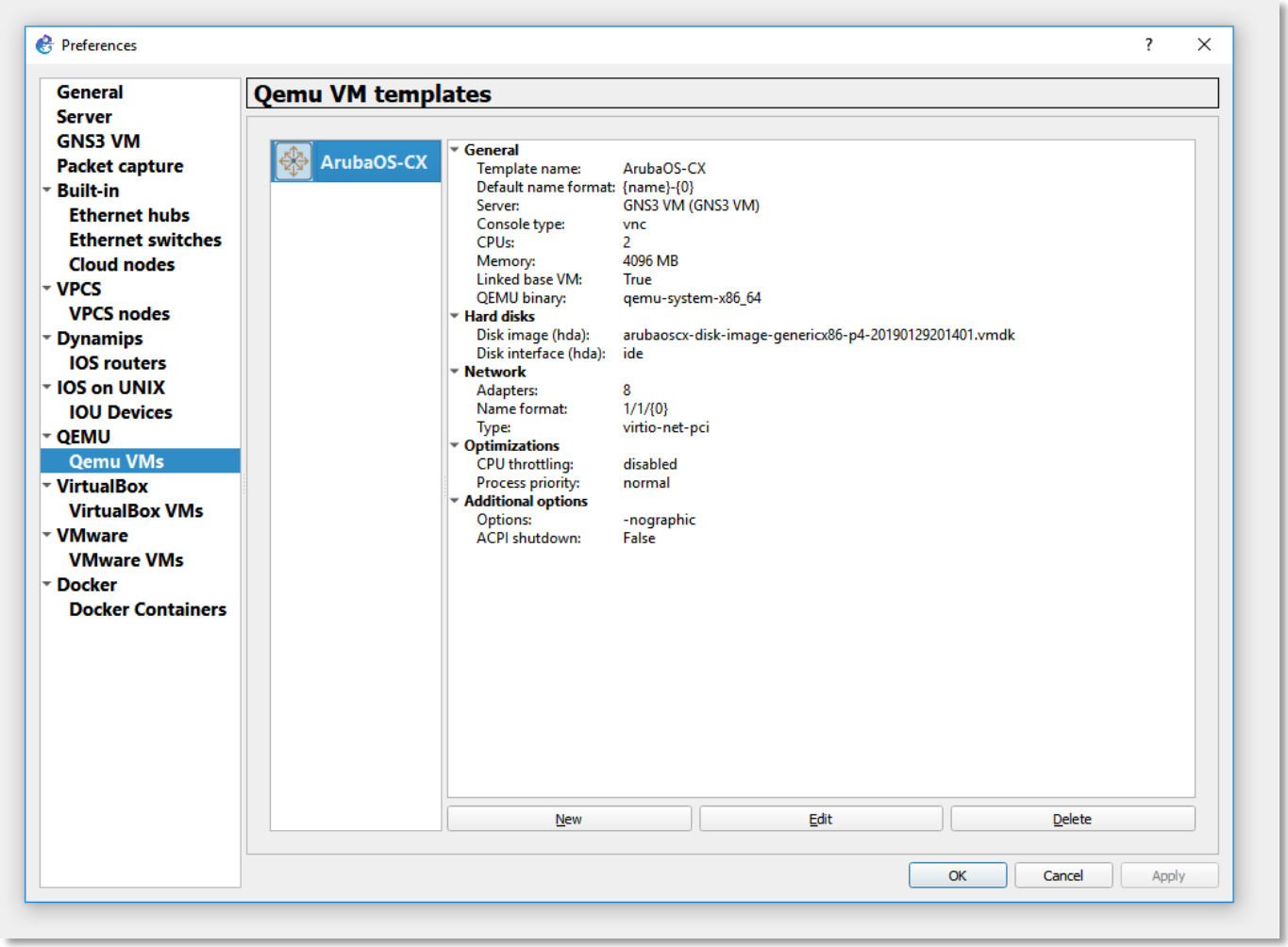
Click Finish:



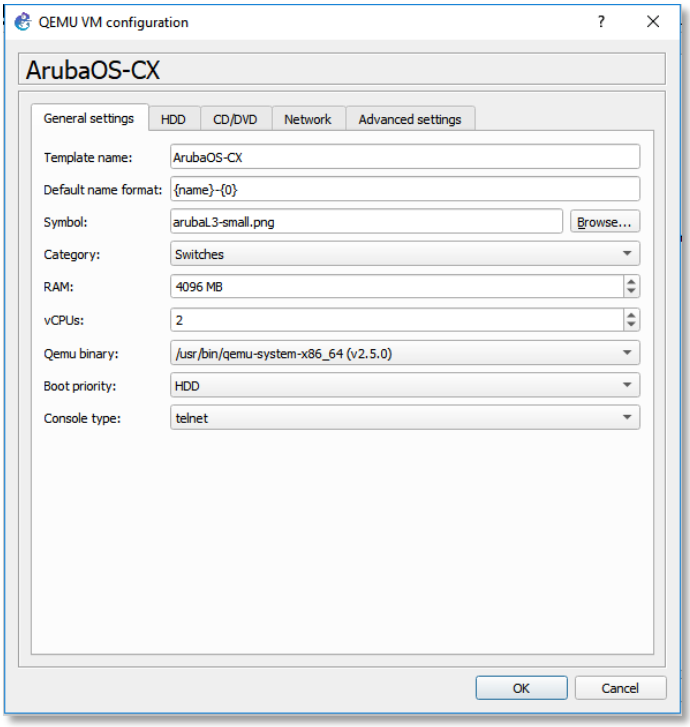
Appliance is installed.

Edit Qemu VM template

Edit/Prefences. Select the Qemu VM template corresponding to the imported appliance.



You'll have to edit the template:



Change:

- Template Name: use for instance ArubaOS-CX or CX or …
- Symbol: use Aruba icon (png file) like:

- Category: select Switches
- Console type: select telnet. This will start putty instead of VNC (text color not tunable in VNC).

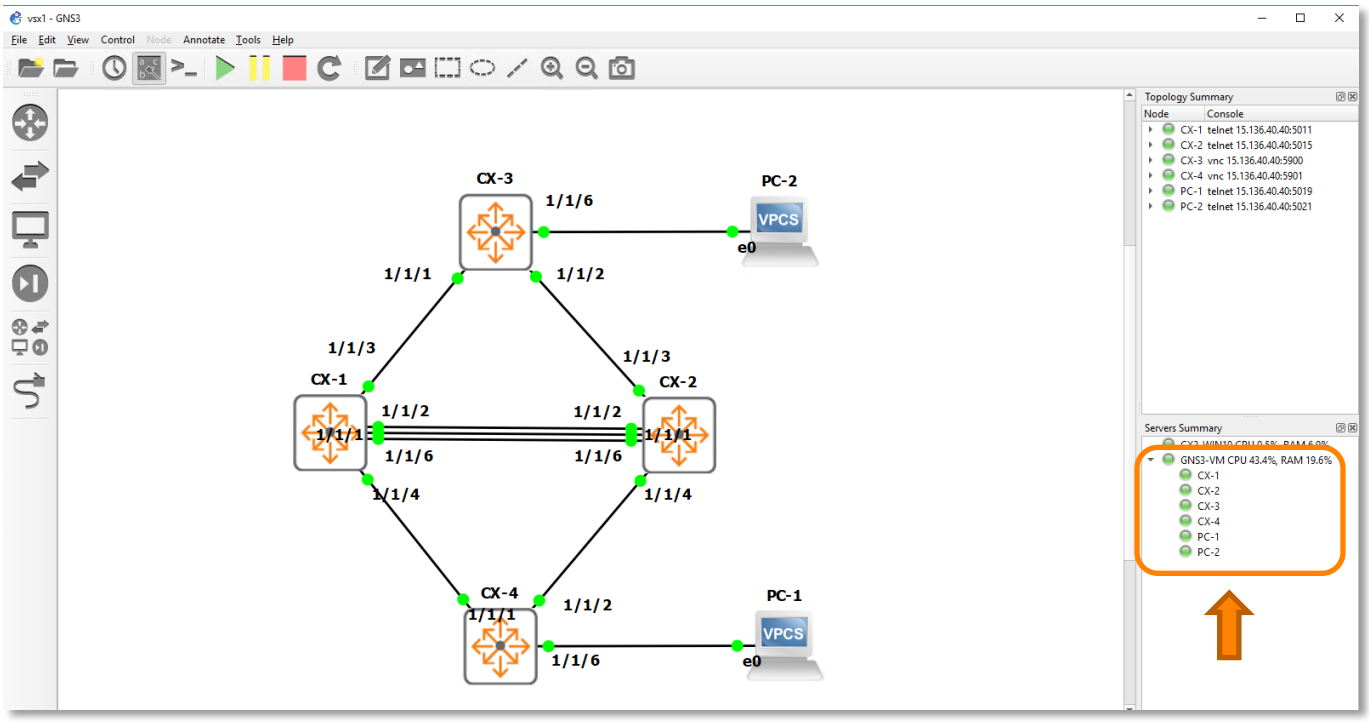
All the other parameters are kept as proposed.

Click ok twice.

Example

You're ready to use GNS3 with CX VMs running on GNS3 KVM, running on ESXi server.

Here a topology example:



On the right side, you can see CX virtual nodes running on remote GNS3 VM.

You can perform start/stop of all VMs at the same time.