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Building an HPE Synergy demonstration environment on your own laptop

Includes Postman, PowerShell, Python and Ansibles live demonstration scenarios

Technical white paper

Version: March 2020

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Abstract

If you agree that a product live demonstration is one of your best tools to strongly impact customers to adopt new technologies, then this technical white paper is for you!

Software-Defined infrastructure, infrastructure programmability (or infrastructure as code) and infrastructure automation are key features to transform, simplify and increase IT productivity. Demonstrating these unique features using a self-built demonstration environment can strongly impacts customers to adopt our technologies as they realize the value and the power of a Synergy Composable Infrastructure.

This technical white paper explains how to create a HPE Synergy demonstration (or learning) environment on your laptop (or personal computer) using the HPE Synergy Composer Demonstration appliance running on Oracle VM VirtualBox and using an Ubuntu Linux environment running on Windows 10 WSL (Windows Subsystem for Linux) to extend our demos to Python and Ansible scenarios.

This document provides all the step-by-step process for creating a simple demonstration environment by installing and configuring all required components with a HPE Synergy Composer/OneView Demonstration appliance, a lightweight Ubuntu Linux distribution fully configured with Python/Ansible/OneView modules running in the astonishing Windows Subsystem for Linux (WSL) from Microsoft, with some snapshots to reset your demonstrations and with some cool scenarios to show live demonstrations of our Infrastructure as code, total datacenter automation.

Live demonstration scenarios include:
- Postman to introduce the OneView REST API, the resource model, OneView object content, etc.
- PowerShell/Python scripts to demonstrate many aspects of the Software Defined Infrastructure, Infra as Code, etc.
- DevOps with Ansible to show how simple automation can be implemented at the Hardware Infrastructure level.

All live demonstration scripts used in this document can be found on https://github.com/jullienl/HPE-Synergy-demonstration-environment

For more information about HPE Synergy, please visit the HPE website. You can access to the HPE Synergy user guides and manuals at www.hpe.com/info/synergy-docs

Requirements

- A powerful laptop with minimum 16G of RAM (best is 32G) and with Intel Virtualization Technology enabled
- CentOS 7.5 Boot ISO
- OneView DCS 5.00 OVA File(s) for Synergy or for BL/DL, the process below is the same for both.
- An update version of Windows 10 (preferably April 2018 update, version 1803) to run the latest version of Windows Subsystem for Linux

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Demonstration appliance prerequisites

HPE Synergy Composer/OneView Demonstration appliance also known as the DCS (Data Center simulator) appliance has many valuable features and capabilities that contains an HPE OneView instance and a datacenter simulator with some simulated resources (Synergy frames, Synergy computes, 3PAR Storage System, etc.). Refer to the HPE OneView Demonstration Appliance Guide for more detailed information.

The DCS appliance is recommended to be deployed on a dual-core 2GHz or greater, 64-bit CPU laptop with a minimum of 16G of RAM (12GB is required for the demonstration appliance itself with 4GB allocated to the host OS and its applications).

With 16G of RAM, it is necessary to close as many applications as possible to get a smooth-running experience. For a better experience, 32G of RAM is recommended.

Important notice: If your laptop does not meet these requirements, you will not be able to run the appliance.

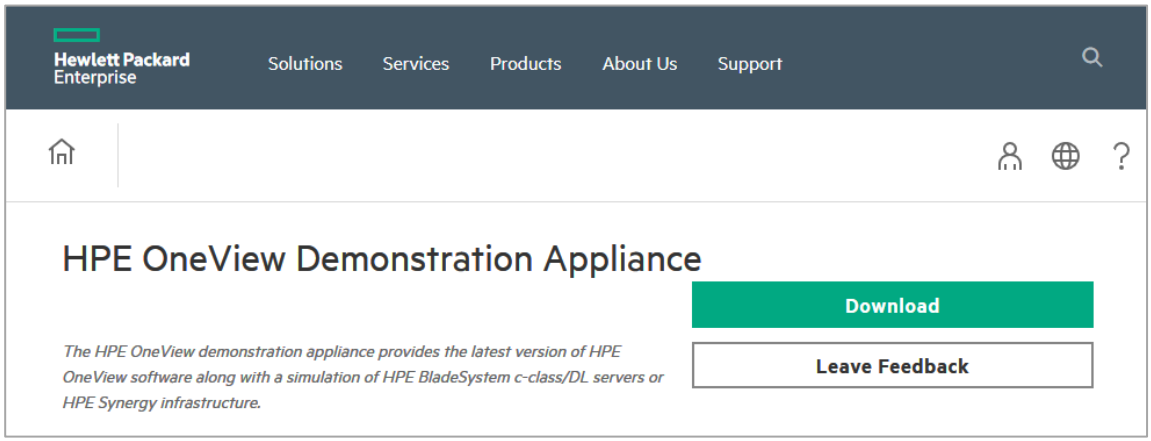
Note: The HPE OneView demonstration appliance is intended for demonstration purposes only and is only available to HPE employees and HPE Partners.

Chapter-1 - Deploying the HPE OneView Demonstration appliance on VirtualBox

Downloading HPE OneView demonstration appliance

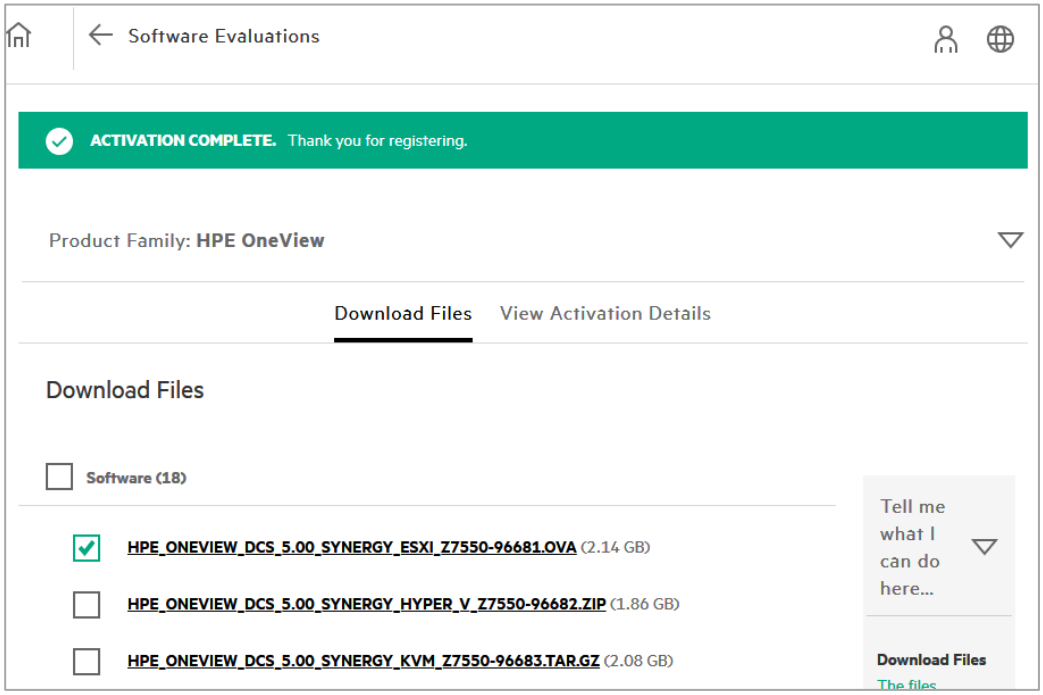
For HPE Employees:

- Log in using your HPE Passport credentials to *HPE My Enterprise License* portal https://myenterpriselicense.hpe.com/cwp-ui/auth/login
- Select **Software for HPE Employees**
- Select **OneView** in the Software Category drop down menu
- Scroll down and select **HPE OneView Demonstration Appliance**



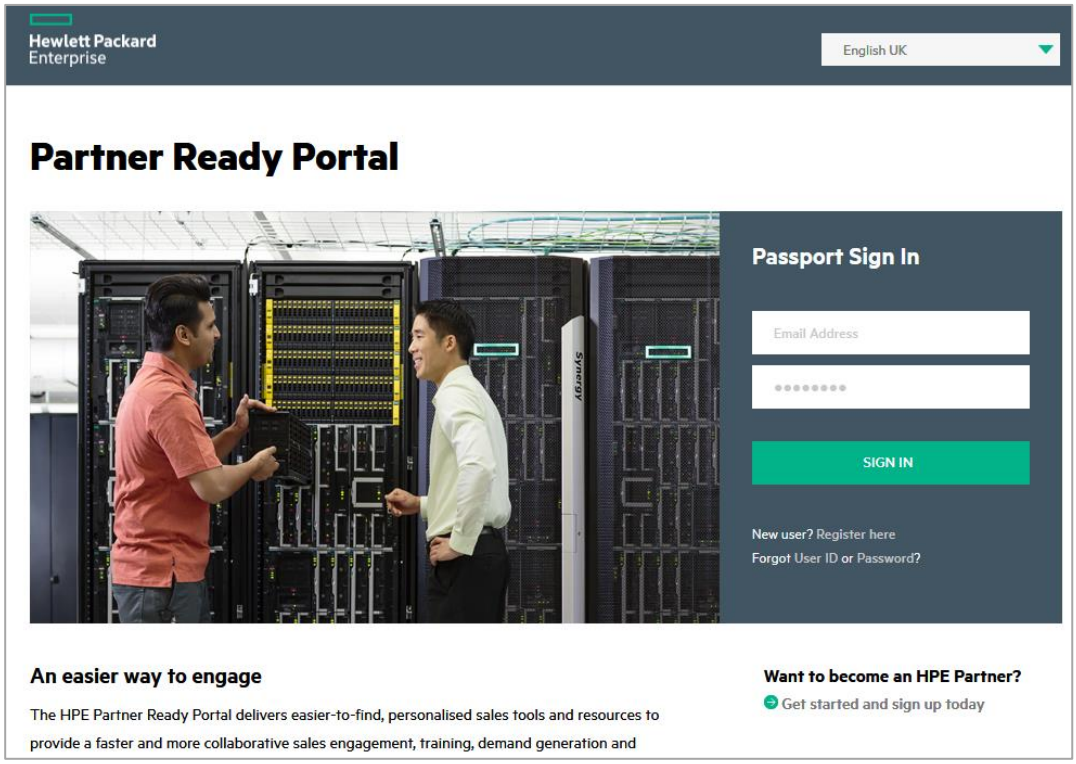
Important notice: HPE OneView demonstration appliance is for internal and channel partner use only. It should not be given to customers.

- Accept the software terms and conditions
- Select **HPE_OneView_DCS_5.00_Synergy_ESXi_Z7550-96681.ova** then click **Download**



For HPE Partners:

- Log in using your HPE Passport credentials to the *HPE Partner Ready Portal* https://partner.hpe.com/



- Select **My Workspace** -> **Manage Software and Licenses**
- Select **SW evaluations**
- Select **All Categories** and scroll to **OneView**
- Accept the software terms and conditions
- Select **HPE_OneView_DCS_5.00_Synergy_ESXi_Z7550-96681.ova** then click **Download**

Downloading CentOS 7.5 Boot ISO

CentOS 7.5 ISO is required to perform a "Rescue" on the HPE OneView demonstration appliance VM in order to change two items to make the appliance boot successful on VirtualBox.

- Download the ISO from http://mirrors.usc.edu/pub/linux/distributions/centos/7.5.1804/isos/x86_64/CentOS-7-x86_64-Minimal-1804.iso

Note: The above file is approximately 1GB and is no longer the current version of CentOS so only some mirrors will have it.

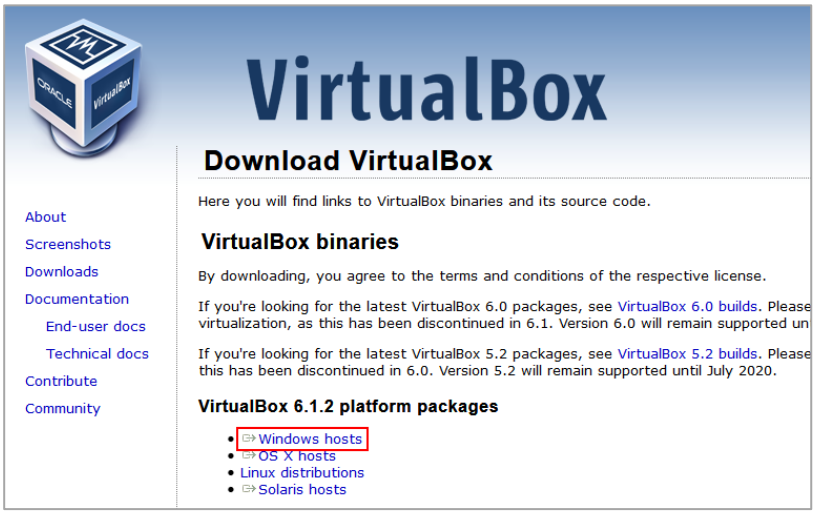
Downloading and installing VirtualBox on your PC

Oracle VM VirtualBox is a free and open-source hosted hypervisor for x86 virtualization, developed by Oracle Corporation. VirtualBox offers many of the VMware Workstation features, and couple of unique ones.

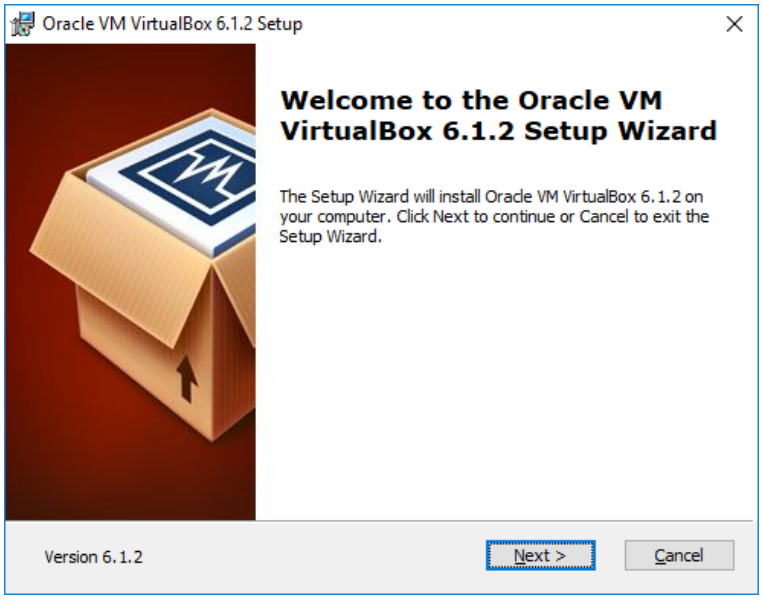
VMware Workstation is free during the trial evaluation period but after that, you'll need to buy a license. This is the reason why VirtualBox from Oracle is becoming a good alternative to run the HPE Demonstration Appliance for HPE Synergy (aka DCS).

As mentioned in the prerequisites, the HPE OneView demonstration appliance is not officially supported with a VirtualBox hypervisor. The main reason for that is simply because it has not been tested and validated by HPE but the experience shows that everything is working properly and as expected if you follow the right procedure.

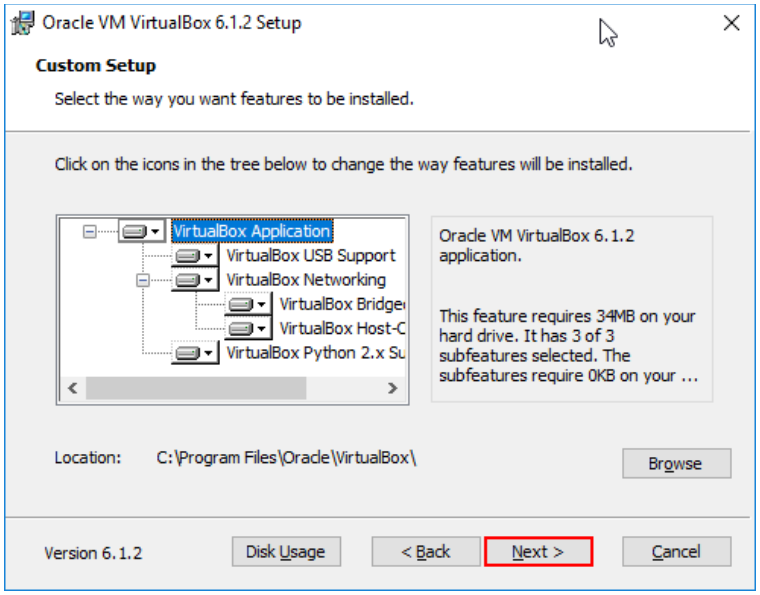
- To download VirtualBox, go to https://www.virtualbox.org/wiki/Downloads
- Select **Windows hosts**



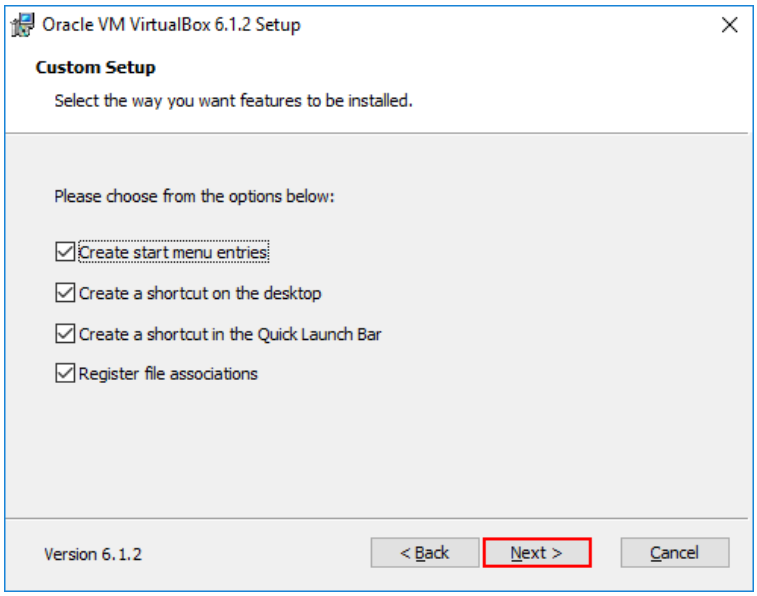
- Save the file on your PC and launch the executable.



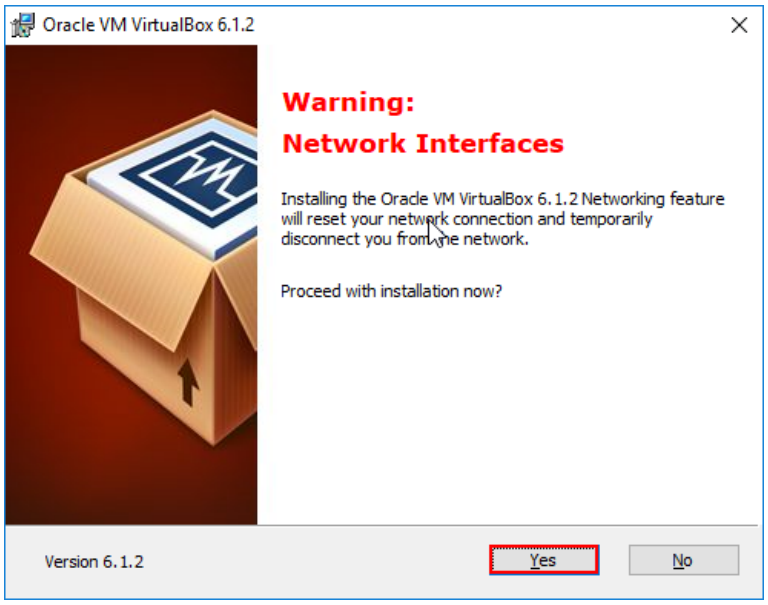
- Leave all default parameters then click **Next**



- Click **Next**

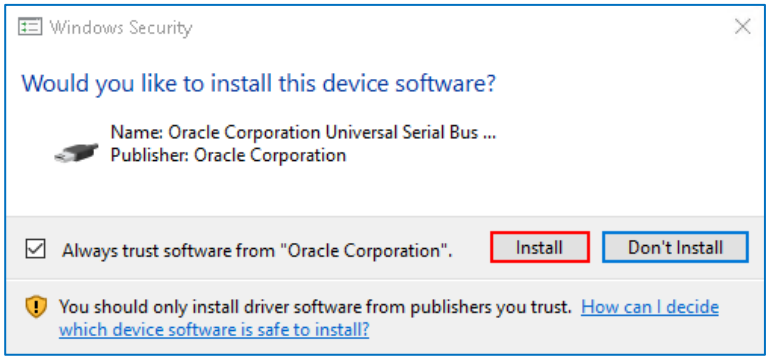


- Click **Next**



- Then click **Yes** to proceed with the installation then click **Install**

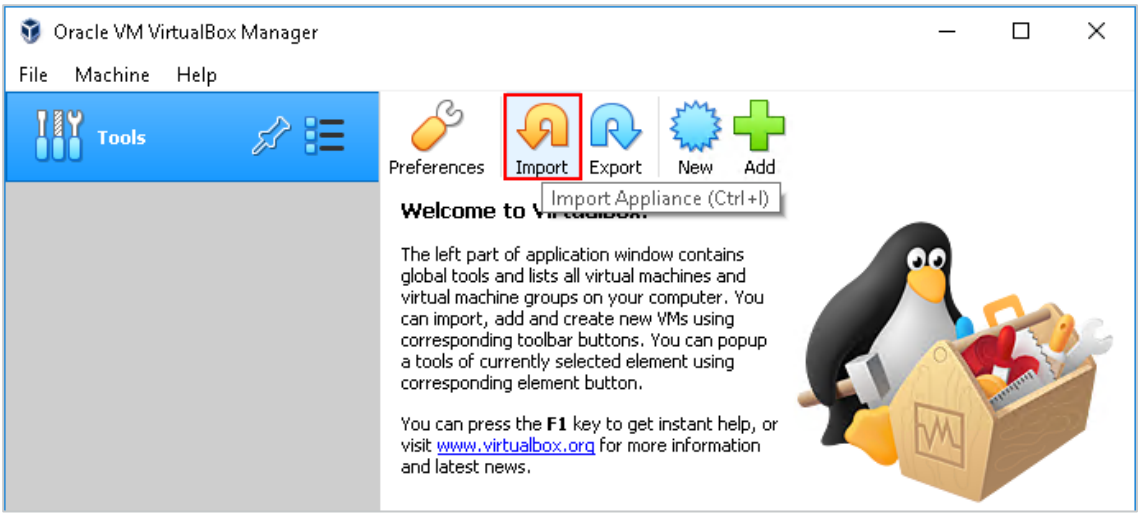
- When the Windows Security message pops-up, click **Install**



- Then click **Finish** with the start option checked

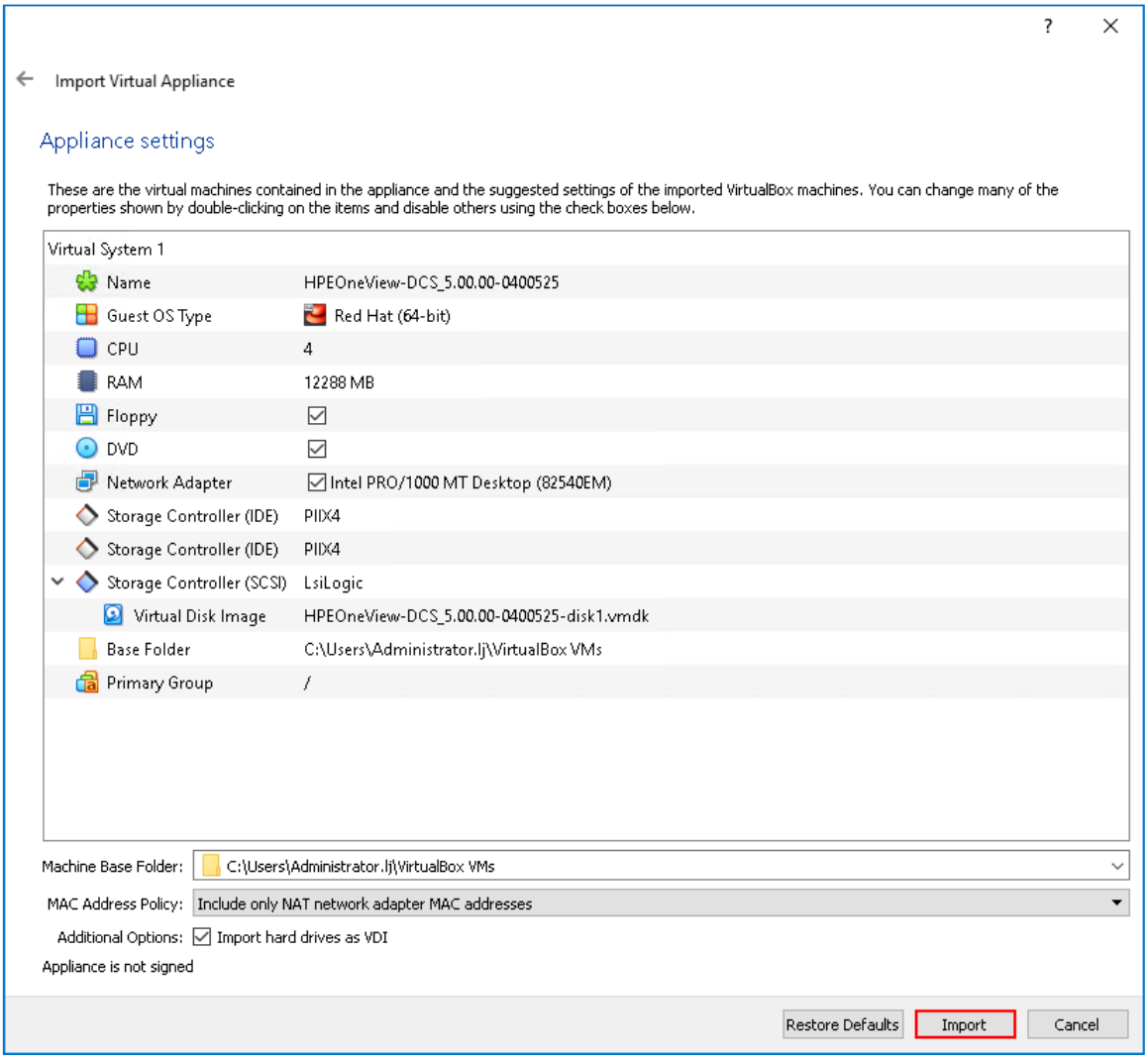
Importing and tuning the HPE OneView Demonstration appliance in VirtualBox

- In VirtualBox, select **Import**

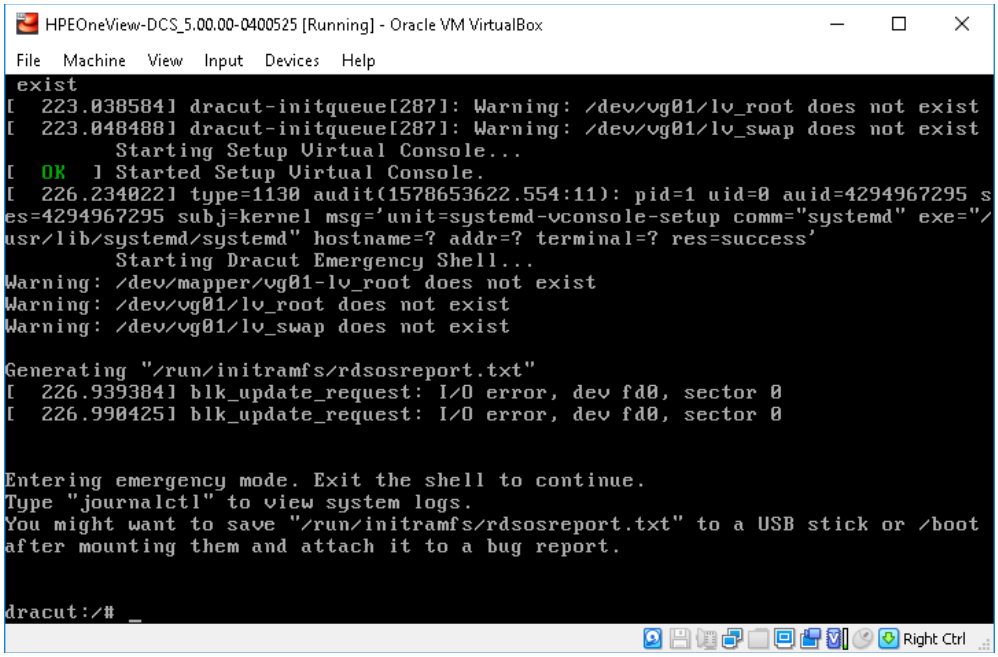


- Select the **HPE_OneView_DCS_5.00_Synergy_ESXi_Z7550-96681.ova** file

- Leave all default parameters then click **Import**

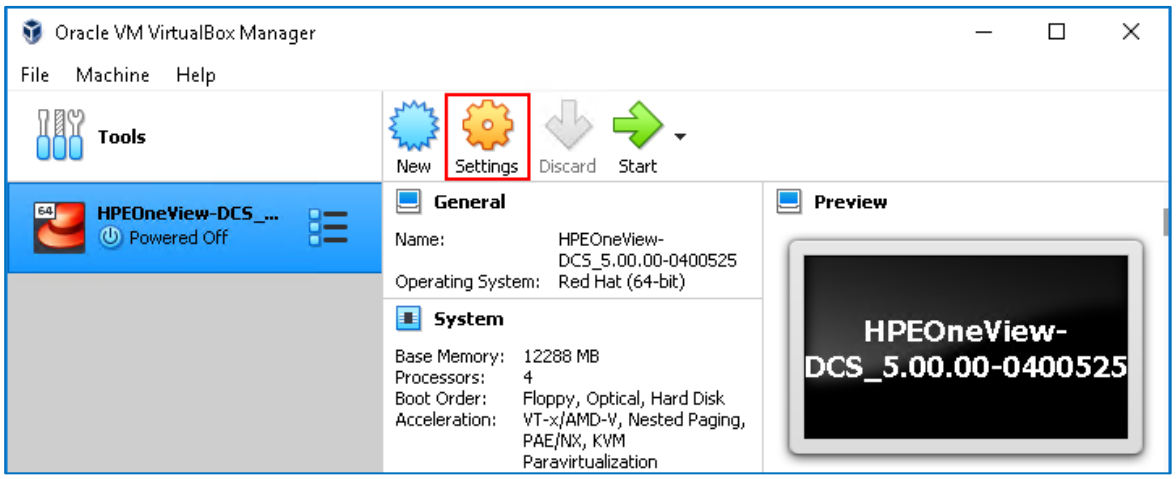


Note: If you start the VM in the current state, the VM is entering in emergency mode because the driver of the disk controller simulated by VirtualBox is not available.

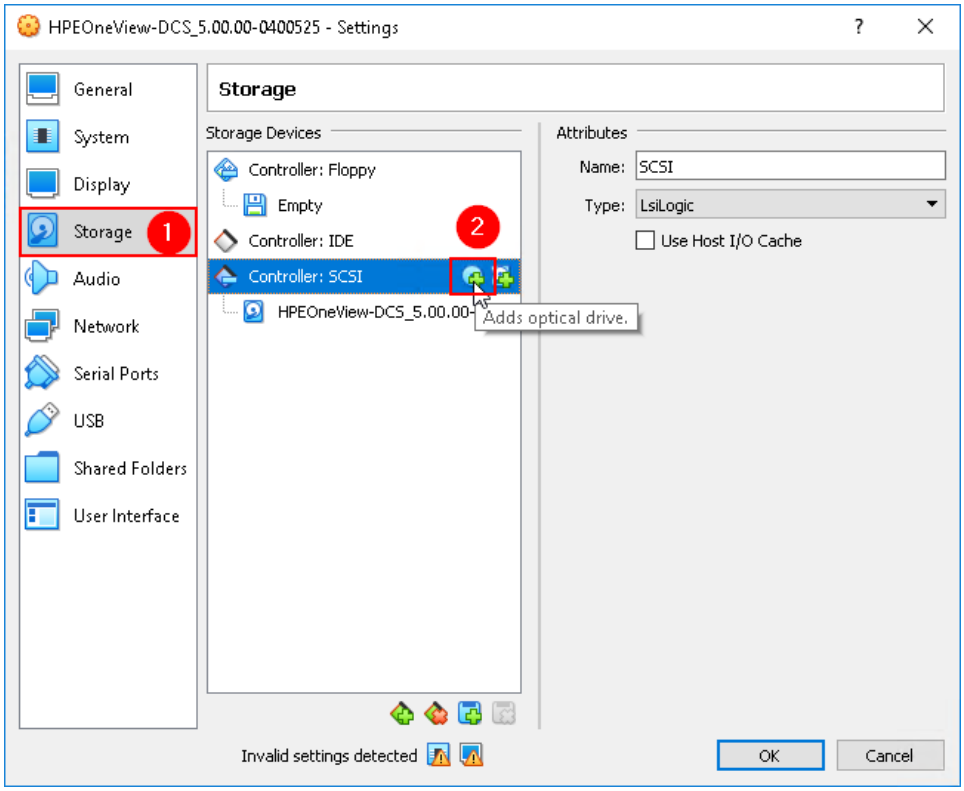


The solution to fix this issue is to inject the missing drivers from a CentOS 7.5 CD ISO.

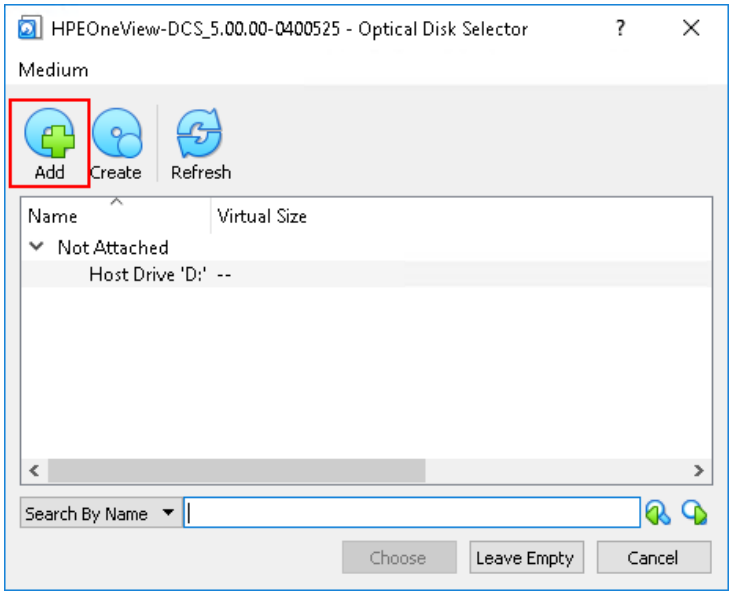
- Edit the VM Settings



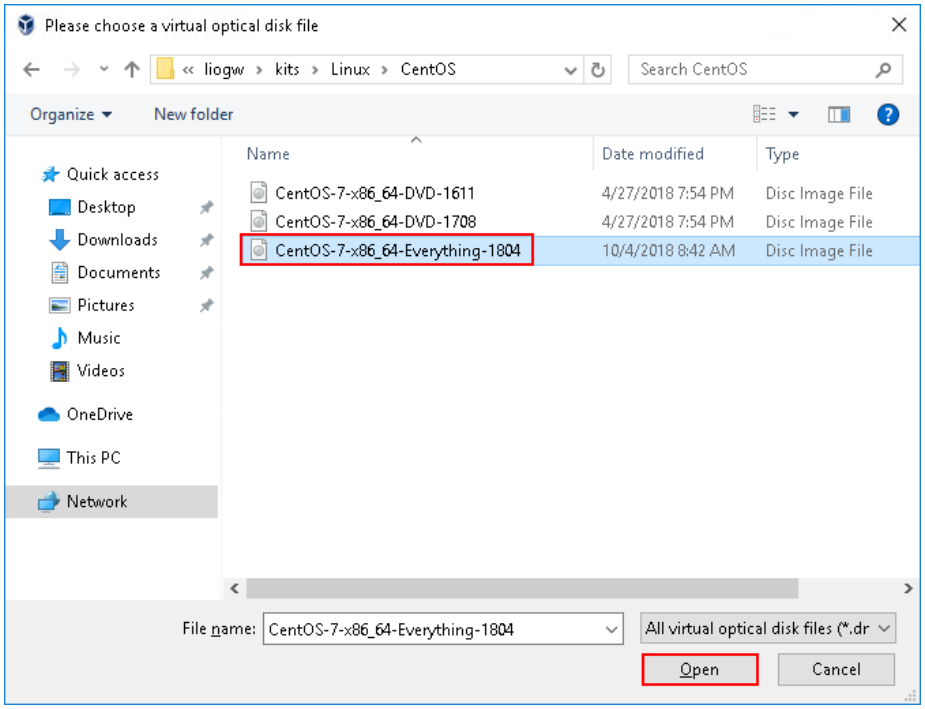
- Select **Storage** then click on **Adds optical drive** icon on the iSCSI Controller



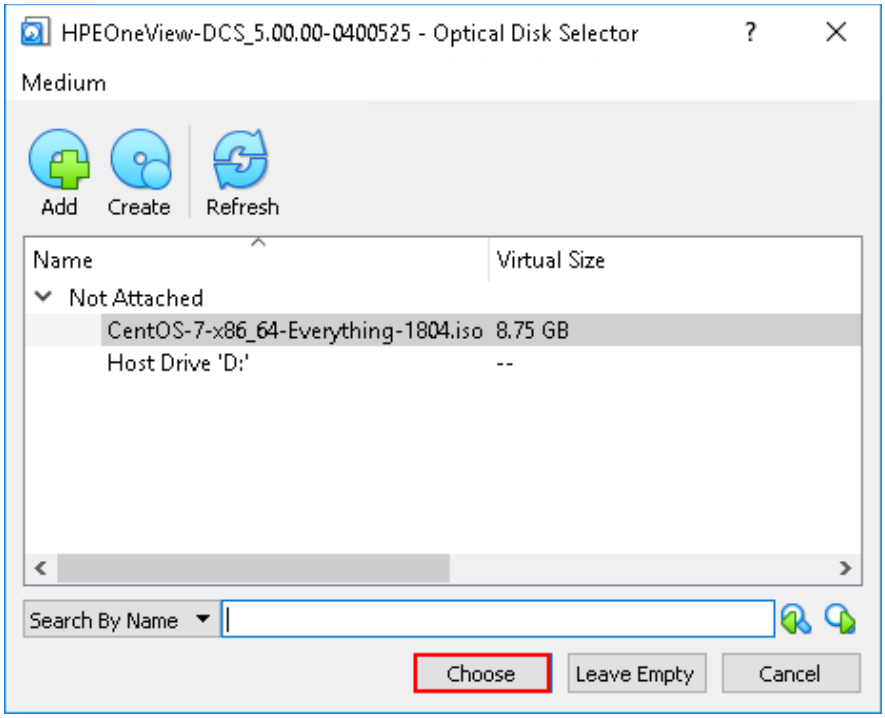
- Select **Add**



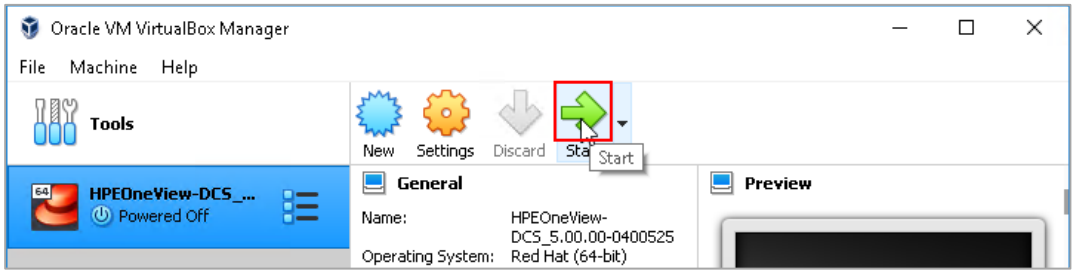
- Select the CentOS ISO image then click **Open**



- Click on **Choose** then **OK**



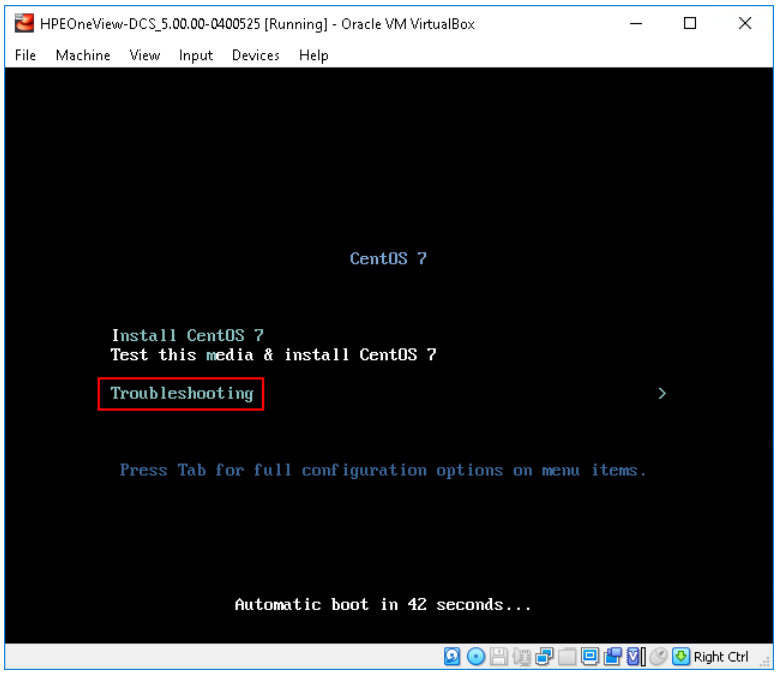
- Then start the VM by pressing **Start**



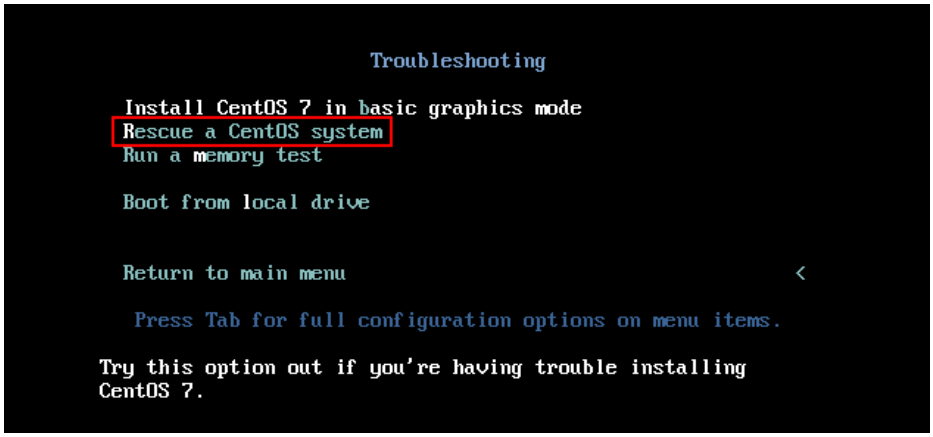
The CentOS starting menu should come up.

Note: If you are seeing some errors when you start the VM, go to the Troubleshooting section

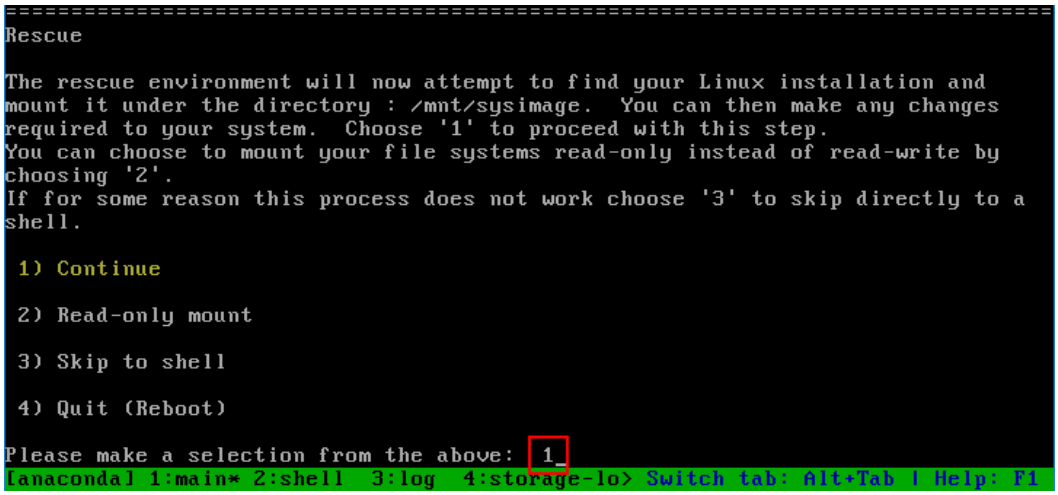
- Select Troubleshooting



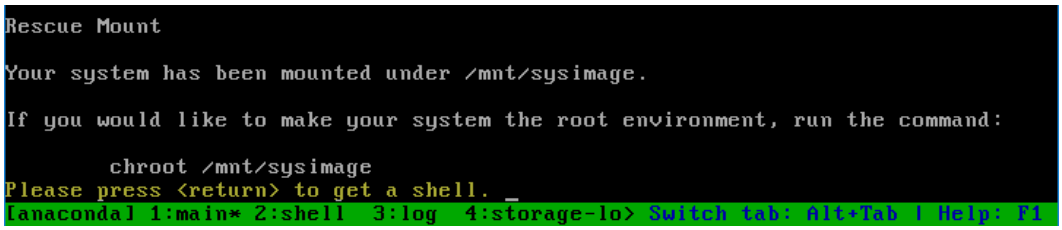
- Then select Rescue a CentOS system



- Select option **1** to continue with Rescue Mode.



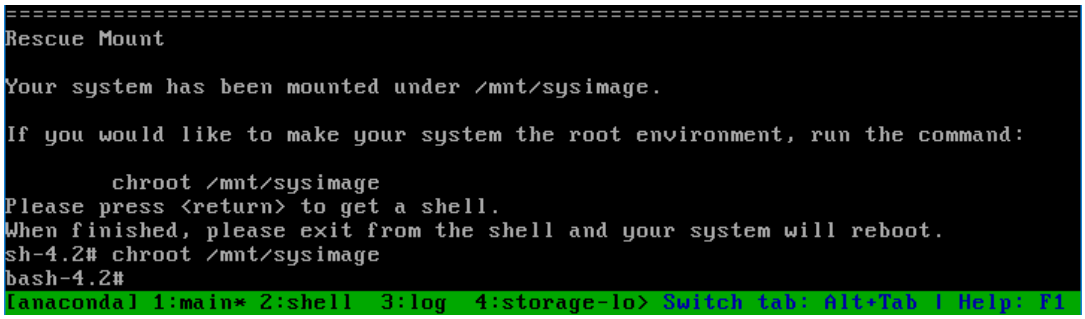
- Press **ENTER** to get a shell.



- Run the following command mentioned in the console to mount the disk drive from the appliance:

```
chroot /mnt/sysimage
```

Note: You can use **TAB** to Autocomplete commands



Your command prompt should change from *sh* to *bash*

Note: To release the mouse from a VirtualBox console use the right Control key on your keyboard

- Run the following to replace the Boot Image with an alternate that contains the drivers we need.

```
cd /boot
cp initramfs-0-rescue-8dbf57addb634b6c8db1e628a7275adb.img initramfs-3.10.0-862.3.2.el7.x86_64.img
```

Note: The filenames may be slightly different between BL/DL and Synergy schematics, use TAB auto complete and you should only need to type the parts in bold followed by TAB in order to get the proper command syntax.

- After running this command, you will receive no feedback, just a prompt.

As part of the OneView 5.00 Security Hardening process, SELinux has been enabled. On some laptops while testing, we observed that SELinux gets in the way and the DCS does not load properly. Perform the following steps to relax the SELinux settings.

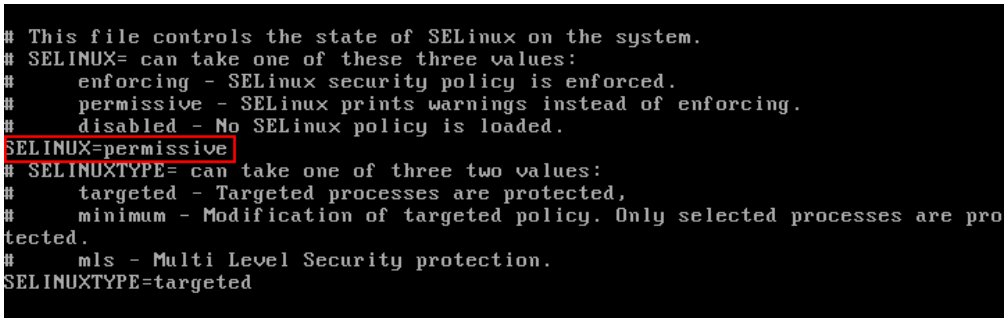
- Change to the SELinux Config folder:

```
cd /etc/selinux
```

- Open the config file for editing:

```
vi config
```

- Press the letter **i** to put the VI editor in *Insert* Mode. Use the arrow keys to move down to the `SELINUX= entry` and change it from `enforcing` to `permissive`



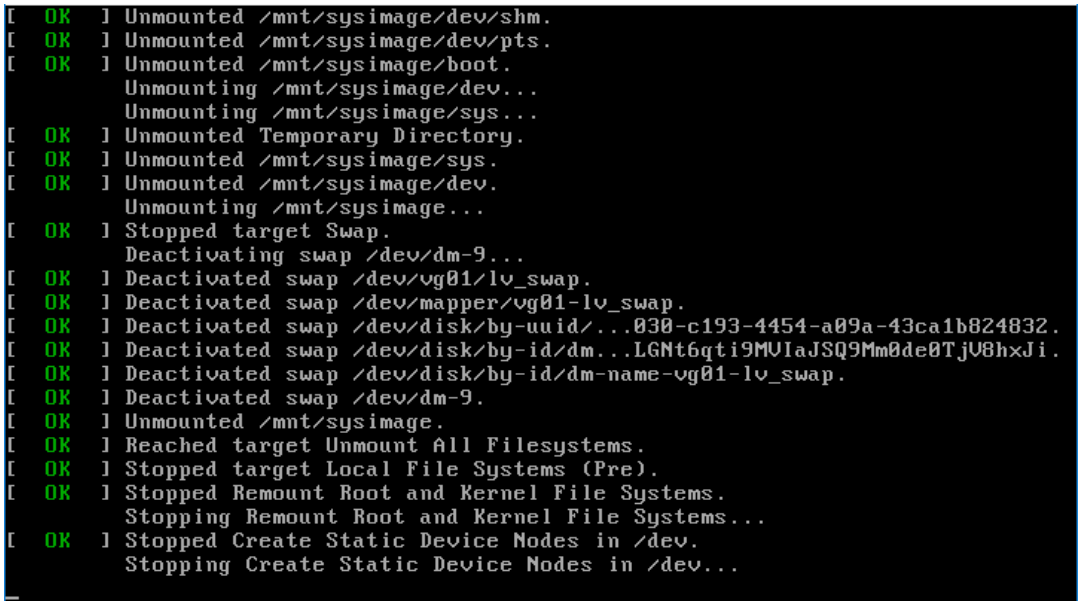
- Press **ESC** to exit *Insert* Mode, then type **:** (colon) to open the vi command prompt, type **wq** and press **ENTER** to Write and Quit vi

- Type the command `exit` and press **enter** to unmount the appliance Image and return to the Rescue Mode shell.

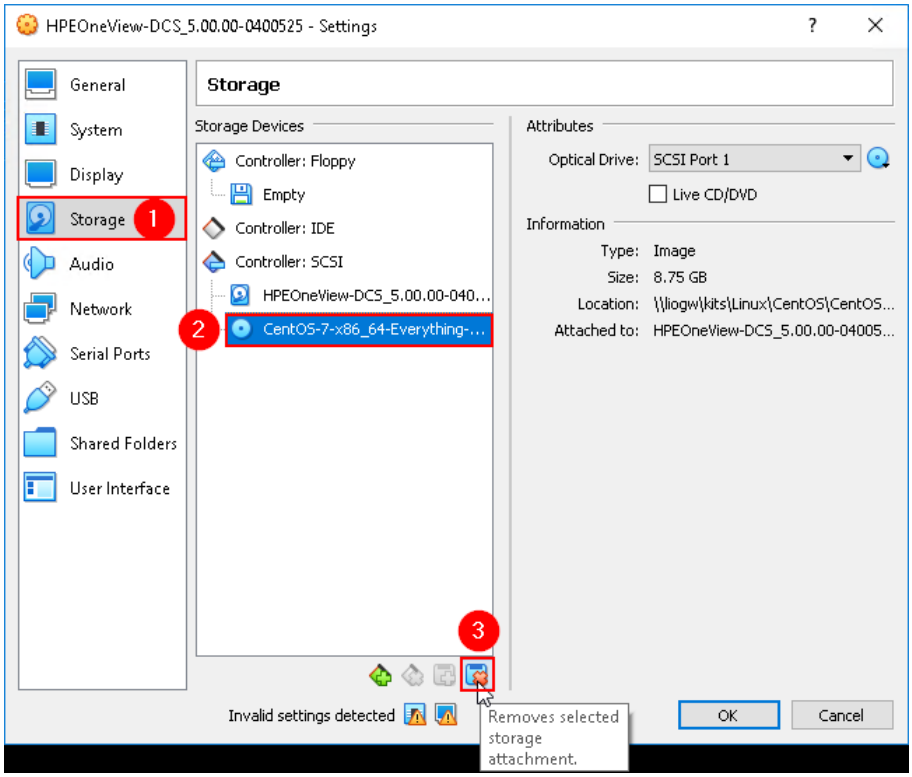
The command prompt should change from *bash* back to *sh*.

- Type the following to shut down the VM:

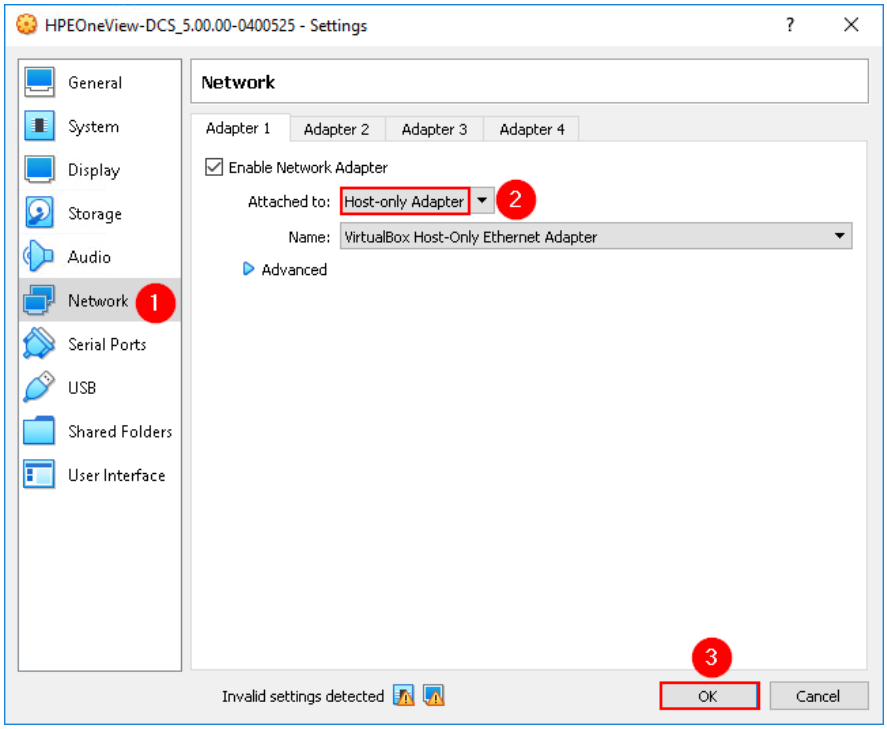
```
shutdown now
```



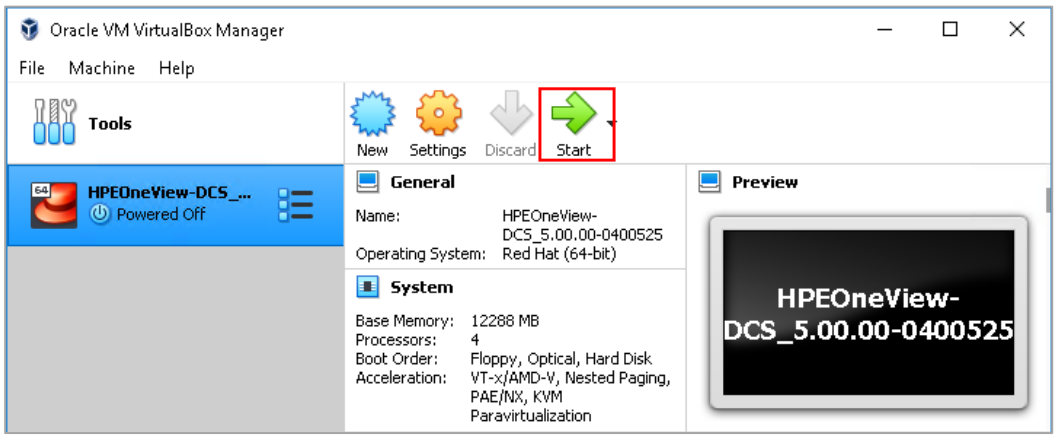
- Once the VM has shutdown, edit the VM **Settings** and remove the CentOS CD.



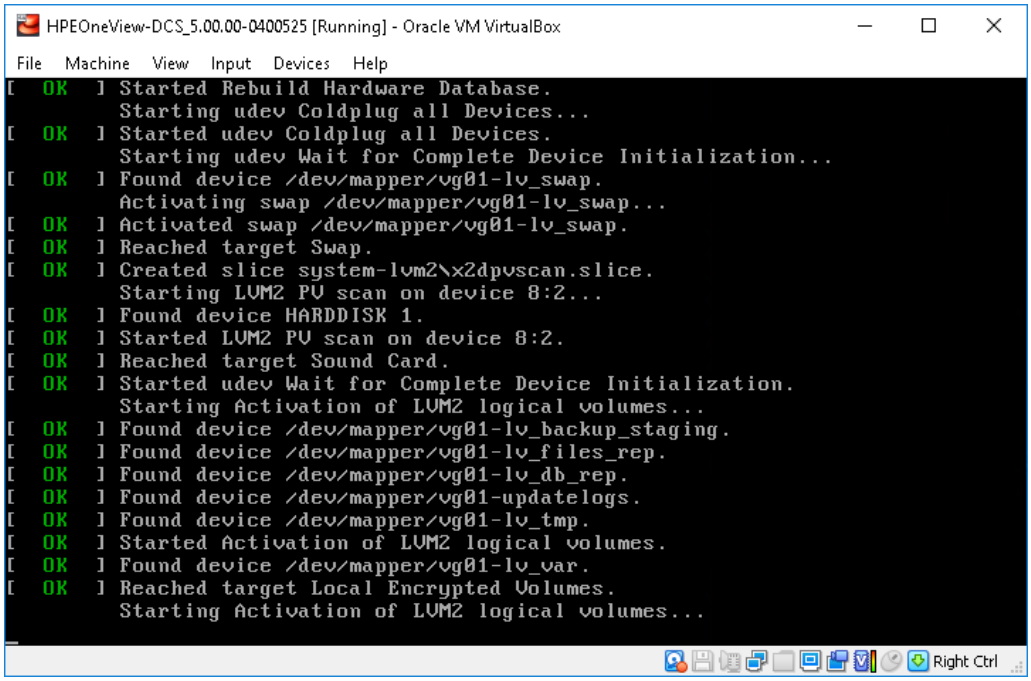
- Then we need to configure the VM network to use **Host-only Adapter** because the appliance requires the network NOT to use DHCP:



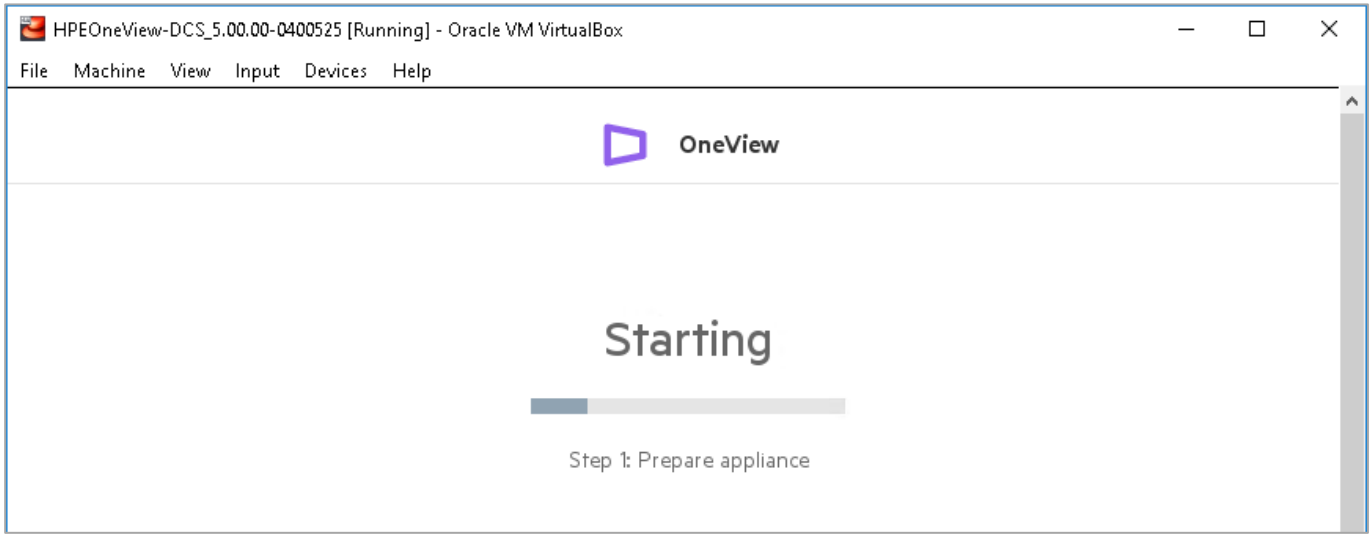
- Click **OK** to save changes, and then click on **Start** to power on the HPE OneView demonstration appliance VM.



- At this point it should begin its normal unpacking process which may reboot the VM a few times.



- When it changes from the Text mode to a GUI, it should be between 15-35 minutes (depends on HDD/SSD speed) before the DCS appliance is fully booted and ready for use.



Note: If your laptop is running with 16GB of memory, it is recommended to shut down as many applications as possible to ensure best performance when running the DCS appliance. Consider also closing temporarily background programs like Skype, OneDrive, etc.

Note: If during the boot a *Maintenance* password is requested, just press **CTRL** + **D** to continue.

At this stage you don't need to wait for the boot to complete, continue to the next chapter.

This concludes Chapter-1

In the next chapter, we will install and configure Windows Subsystem for Linux.

Chapter-2 – Preparing Ubuntu on Windows Subsystem for Linux (WSL)

Installing Windows Subsystem for Linux (WSL)

Windows Subsystem for Linux (WSL) is an optional feature on Windows 10 that creates a lightweight environment that allows you to install and run supported versions of Linux (such as Ubuntu, OpenSUSE, Debian, etc.) without the complexity and overhead of a virtual machine. It's terribly light, fast and easy to use.

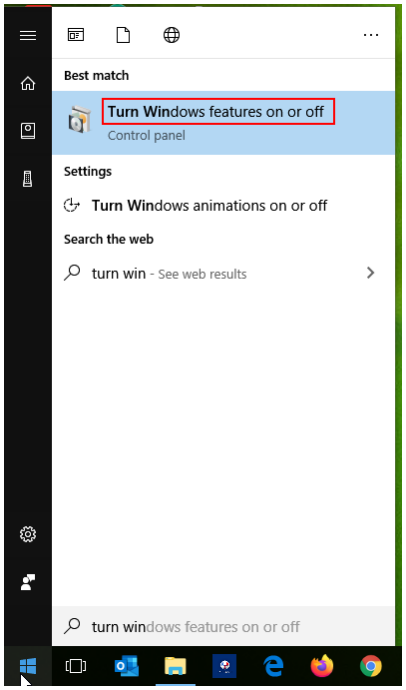
To learn more, see https://docs.microsoft.com/en-us/windows/wsl

For our PC demonstration environment, we are going to use WSL to run Python, Ansible and the Ansible module for HPE OneView.

Note: It is recommended to use a recent version of WSL (Windows 10, April 2018 update, version 1803) to get better performance, more compatibility with Linux-native applications and VS Code extensions. (You can run *winver* to find the Windows version you are running).

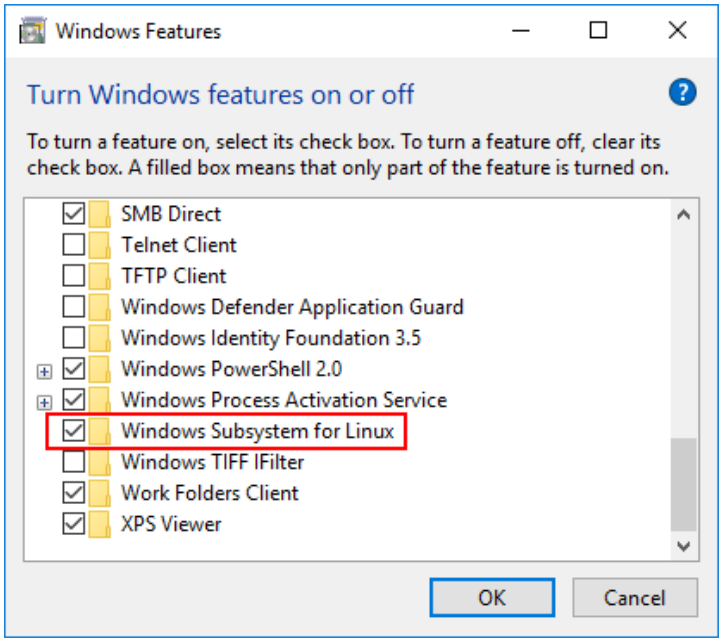
Note: The old version of WSL in Windows version 1709 can still be used for this lab

- To enable the WSL feature, open the Windows start menu and enter **Turn windows**



- Then select **Turn Windows Features on and off**

- Select the **Windows Subsystem for Linux** check box.

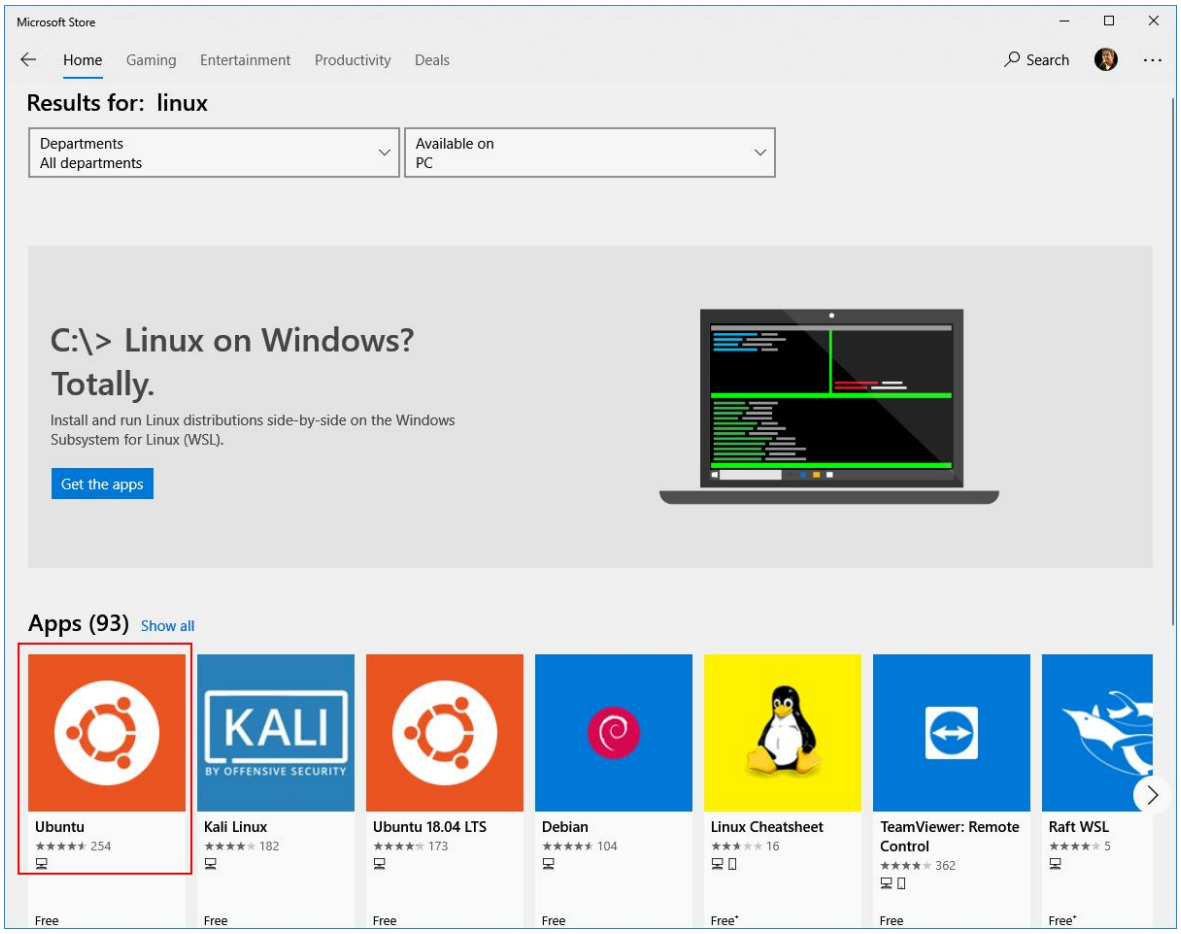


Once turned on, follow the instructions and do any restarts if you have to.

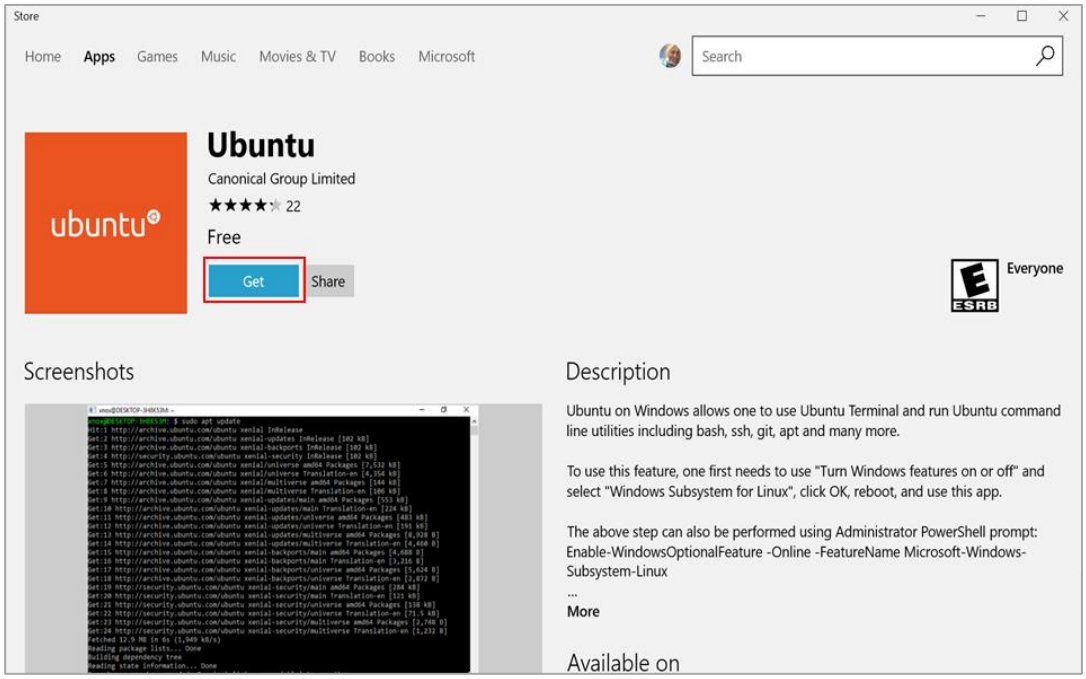
Installing Ubuntu Windows Subsystem for Linux

Next, we need to install a Linux distribution, we are going to use Ubuntu since that is one of the most popular. Start the Microsoft Store and search for **Linux**.

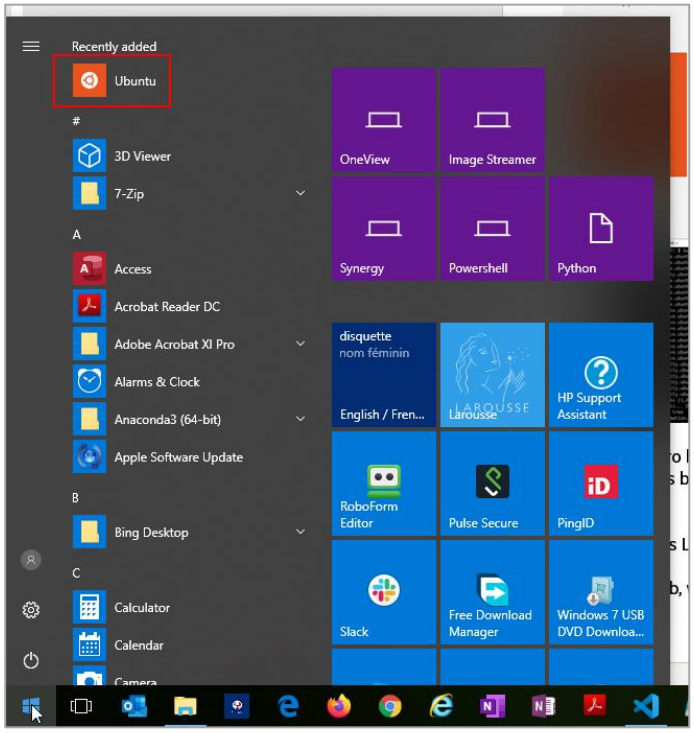
- Select **Ubuntu**



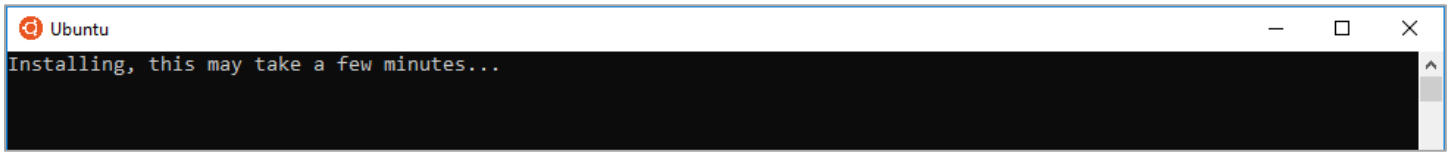
- Then select **Get**



- Once Ubuntu has been downloaded and installed, click the **Launch** button in the Microsoft Store app, or launch Ubuntu from the Start menu:

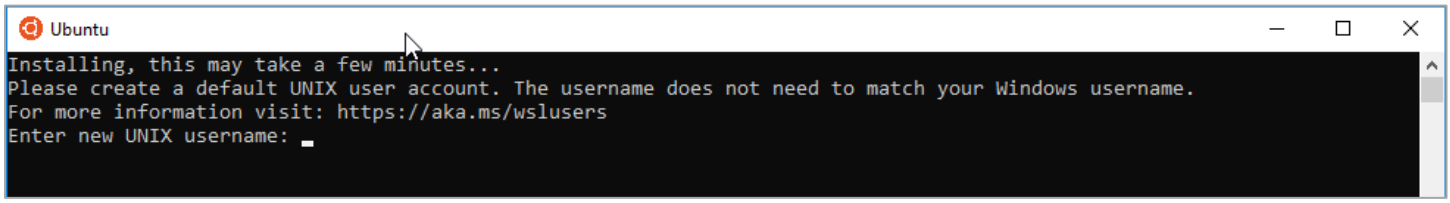


The first time a newly installed distro runs, a Console window will open, and we'll be asked to wait for a minute or two for the installation to complete.



Note: This may take around a minute or more depending on the performance of your PC's storage devices. This initial installation phase is only required when a distro is clean-installed - all future launches should take less than a second.

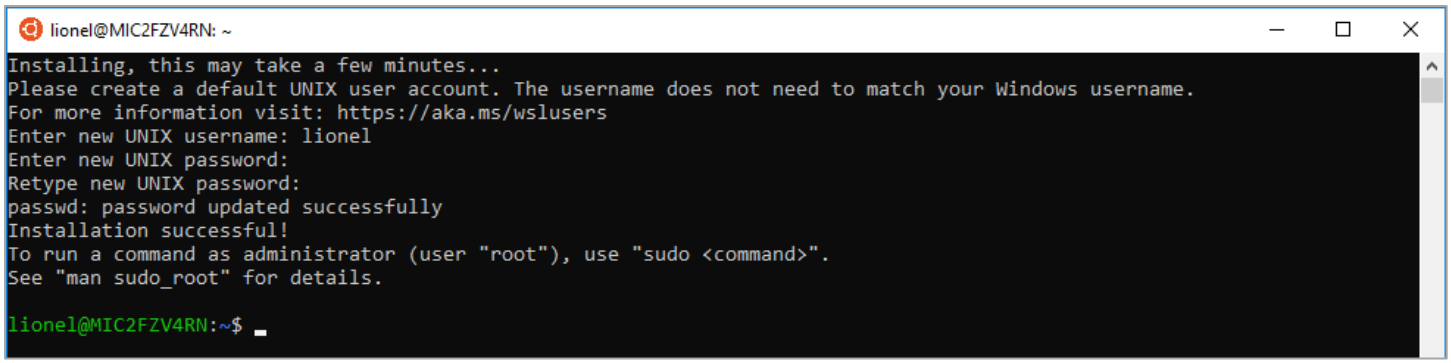
Once installation is complete, you will be prompted to create a new user account (and its password).



This user account is for the normal non-admin user that you'll be logged-in as by default when launching a distro.

Note: You can choose any *username* and *password* you wish - they have no bearing on your Windows username.

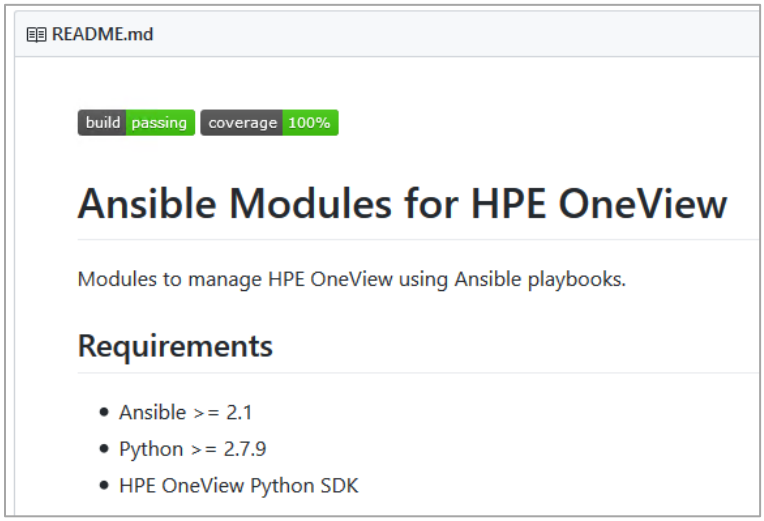
Note: When you open a new distro instance, you won't be prompted for your password, but if you elevate a process using *sudo*, you will need to enter your password, so make sure you choose a password you can easily remember!



Note: Python should be already installed (`python3 --version`)

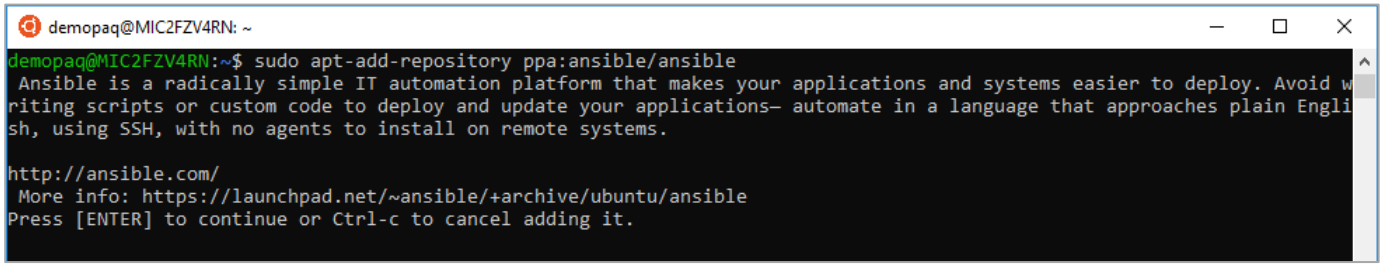
Installing Ansible on Ubuntu WSL

Next, we want to install in this Linux installation all the requirements found at https://github.com/HewlettPackard/oneview-ansible to run the Ansible modules for HPE OneView:



- To install Ansible, enter:

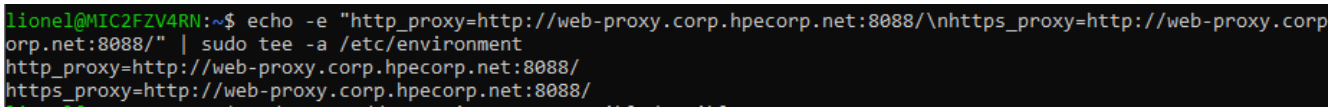
```
sudo apt-add-repository ppa:ansible/ansible
```



- Press **Enter** to continue

Note: if you are behind a corporate proxy, you need to set the proxy environment variables:

```
echo -e "http_proxy=http://domain\user:pass@proxy_host:port/\nhttps_proxy=
domain\user:pass@proxy_host:port/" | sudo tee -a /etc/environment
```



```
Get:25 http://security.ubuntu.com/ubuntu bionic-security/main Translation-en [208 kB]
Get:26 http://security.ubuntu.com/ubuntu bionic-security/restricted amd64 Packages [21.2 kB]
Get:27 http://security.ubuntu.com/ubuntu bionic-security/restricted Translation-en [5984 B]
Get:28 http://security.ubuntu.com/ubuntu bionic-security/universe amd64 Packages [645 kB]
Get:29 http://security.ubuntu.com/ubuntu bionic-security/universe Translation-en [217 kB]
Get:30 http://security.ubuntu.com/ubuntu bionic-security/multiverse amd64 Packages [6340 B]
Get:31 http://security.ubuntu.com/ubuntu bionic-security/multiverse Translation-en [2640 B]
Fetched 18.4 MB in 26s (709 kB/s)
Reading package lists... Done
demopaq@MIC2FZV4RN:~$
demopaq@MIC2FZV4RN:~$
```

- Next, we need to update *apt*, type:

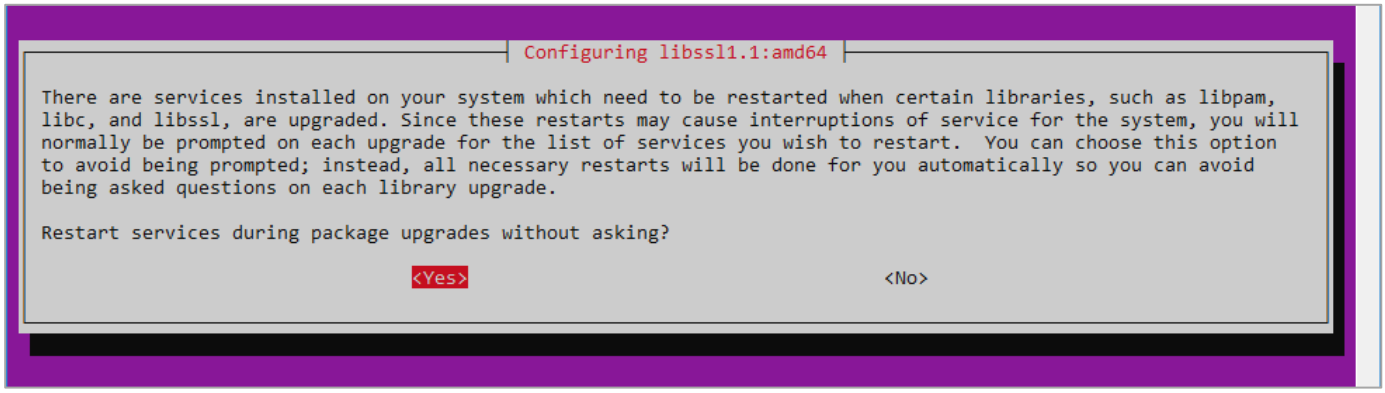
```
sudo apt-get update
```

```
demopaq@MIC2FZV4RN:~$ sudo apt-get update
Hit:1 http://security.ubuntu.com/ubuntu bionic-security InRelease
Hit:2 http://ppa.launchpad.net/ansible/ansible/ubuntu bionic InRelease
Hit:3 http://archive.ubuntu.com/ubuntu bionic InRelease
Hit:4 http://archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:5 http://archive.ubuntu.com/ubuntu bionic-backports InRelease
Reading package lists... Done
demopaq@MIC2FZV4RN:~$
```

- Then we can install Ansible with:

```
sudo apt-get install ansible -y
```

- If asked, accept any service restart messages:



- Once completed, you can check the Ansible installation by entering:

```
ansible --version
```

```
demopaq@MIC2FZV4RN:~$ ansible --version
ansible 2.9.4
  config file = /etc/ansible/ansible.cfg
  configured module search path = [u'/home/demopaq/.ansible/plugins/modules', u'/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python2.7/dist-packages/ansible
  executable location = /usr/bin/ansible
  python version = 2.7.17 (default, Nov  7 2019, 10:07:09) [GCC 7.4.0]
demopaq@MIC2FZV4RN:~$
```

Installing HPE OneView Python SDK on Ubuntu WSL

To install the HPE OneView Python SDK, we are using the information from https://github.com/HewlettPackard/oneview-python

- Type:

```
git clone https://github.com/HewlettPackard/oneview-python.git
cd oneview-python
python setup.py install --user
```

```
past.builtins.misc: module MAY be using inspect.stack
past.translation.__init__: module references __file__
past.translation.__init__: module references __path__
creating /home/demopaq/.local/lib/python2.7/site-packages/future-0.18.2-py2.7.egg
Extracting future-0.18.2-py2.7.egg to /home/demopaq/.local/lib/python2.7/site-packages
Adding future 0.18.2 to easy-install.pth file
Installing pasteurize script to /home/demopaq/.local/bin
Installing futurize script to /home/demopaq/.local/bin

Installed /home/demopaq/.local/lib/python2.7/site-packages/future-0.18.2-py2.7.egg
Finished processing dependencies for hpOneView==5.0.0
demopaq@MIC2FZV4RN:~/oneview-python$
```

Important notice: Do not to use the *python-hpOneView* repository from https://github.com/HewlettPackard/python-hpOneView! This is the repository to support legacy SDKs

Note: if you are behind a corporate proxy, you need to set a Git proxy:

```
git config --global http.proxy http://proxy.server.com:port/
git config --global https.proxy http://proxy.server.com:port/
```

```
lionel@MIC2FZV4RN:~$ git config --global http.proxy http://web-proxy.corp.hpecorp.net:8088/
lionel@MIC2FZV4RN:~$ git config --global https.proxy http://web-proxy.corp.hpecorp.net:8088/
lionel@MIC2FZV4RN:~$
```

- Once the module is successfully installed, you can test the module by typing:

```
python3
```

- Then import the HPOneView module with:

```
from hpOneView.oneview_client import OneViewClient
```

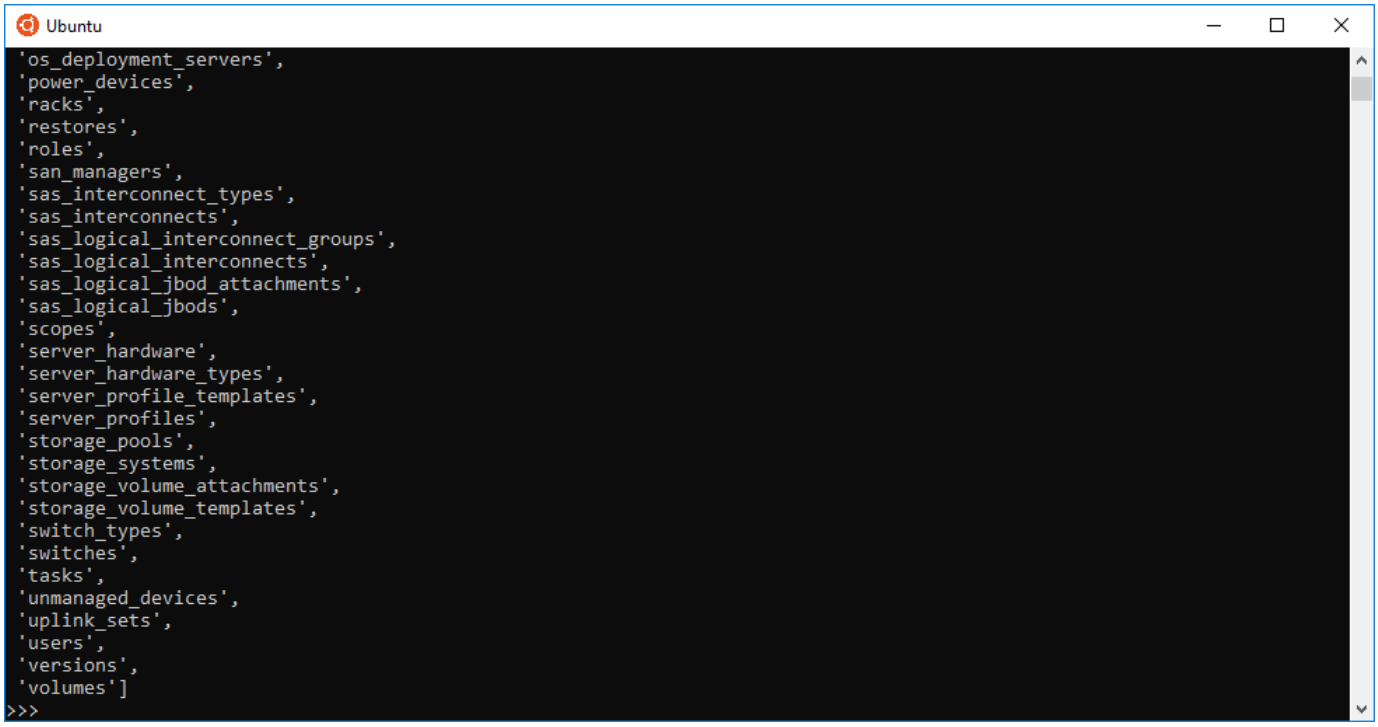
```
Ubuntu
lionel@MIC2FZV4RN:~$ from hpOneView.oneview_client import OneViewClient
from: can't read /var/mail/hpOneView.oneview_client
lionel@MIC2FZV4RN:~$ python3
Python 3.6.9 (default, Nov  7 2019, 10:44:02)
[GCC 8.3.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> from hpOneView.oneview_client import OneViewClient
>>>
```

- Import the *pprint* function as well, we'll use it to make output more readable

```
from pprint import pprint
```

- You can examine the list of members of the *OneViewClient* class with:

```
pprint(dir(OneViewClient))
```



If you get a response with all the list members as illustrated above, your module is successfully installed.

- To exit the Python environment, press **CTRL** + **z**

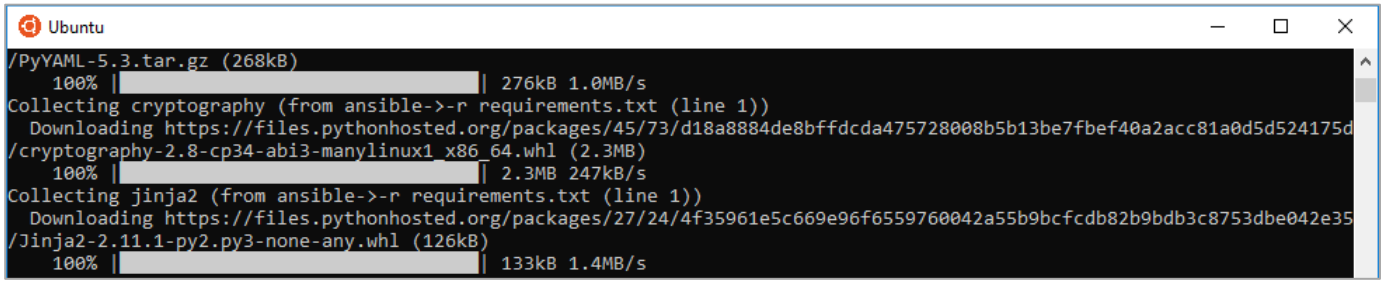
Installing Ansible Modules for HPE OneView on Ubuntu WSL

Next step, we need to install the Ansible Modules for HPE OneView using the information from https://github.com/HewlettPackard/oneview-ansible

- Enter:

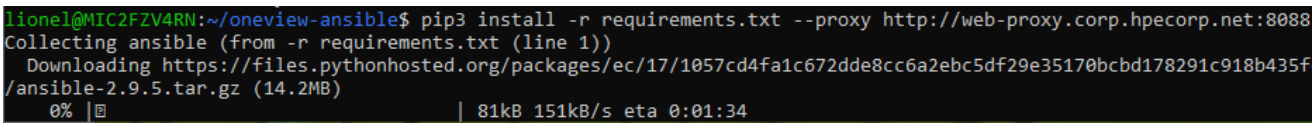
```
sudo apt-get install python3-pip
cd ..
git clone https://github.com/HewlettPackard/oneview-ansible.git
pip3 install -r requirements.txt
```

The last step will take several minutes, please be patient…



Note: if you are behind a corporate proxy, you need to define a proxy:

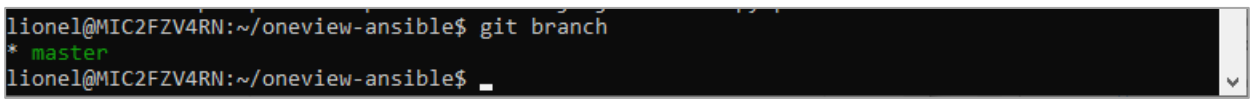
```
pip3 install -r requirements.txt --proxy http://proxy.server.com:port/
```



At the time of writing this document, the fix for the *oneview_server_profile* module that cannot create multiple server profiles in parallel (see https://github.com/HewlettPackard/oneview-ansible/issues/313) was not included in the new 5.0.0 release. As we need this fix for one of our demos, we need to merge the branch with the fix to our cloned directory.

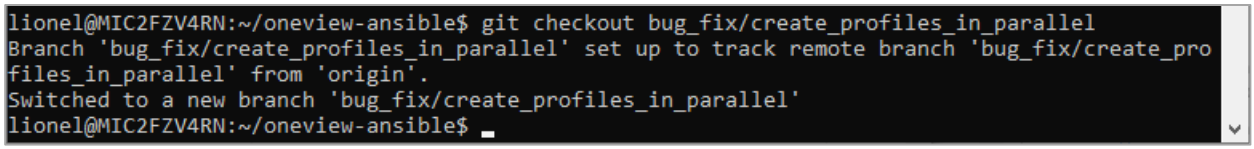
- At the moment, we have only one branch Master:

```
git branch
```



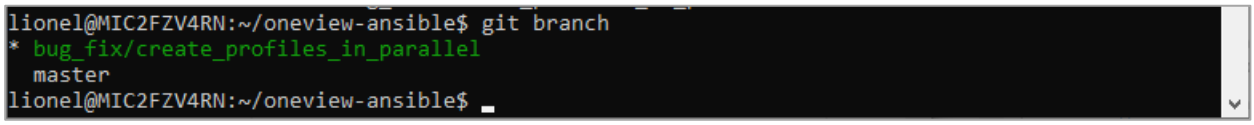
- Enter the following to navigate to the fix branch:

```
git checkout bug_fix/create_profiles_in_parallel
```



- This changes the active branch to the new branch.

```
git branch
```



Note: The asterisk shows the currently active branch.

- Then we run

```
git checkout master
```

to change the active branch back to *master*. Then we run the command

```
git merge bug_fix/create_profiles_in_parallel
```

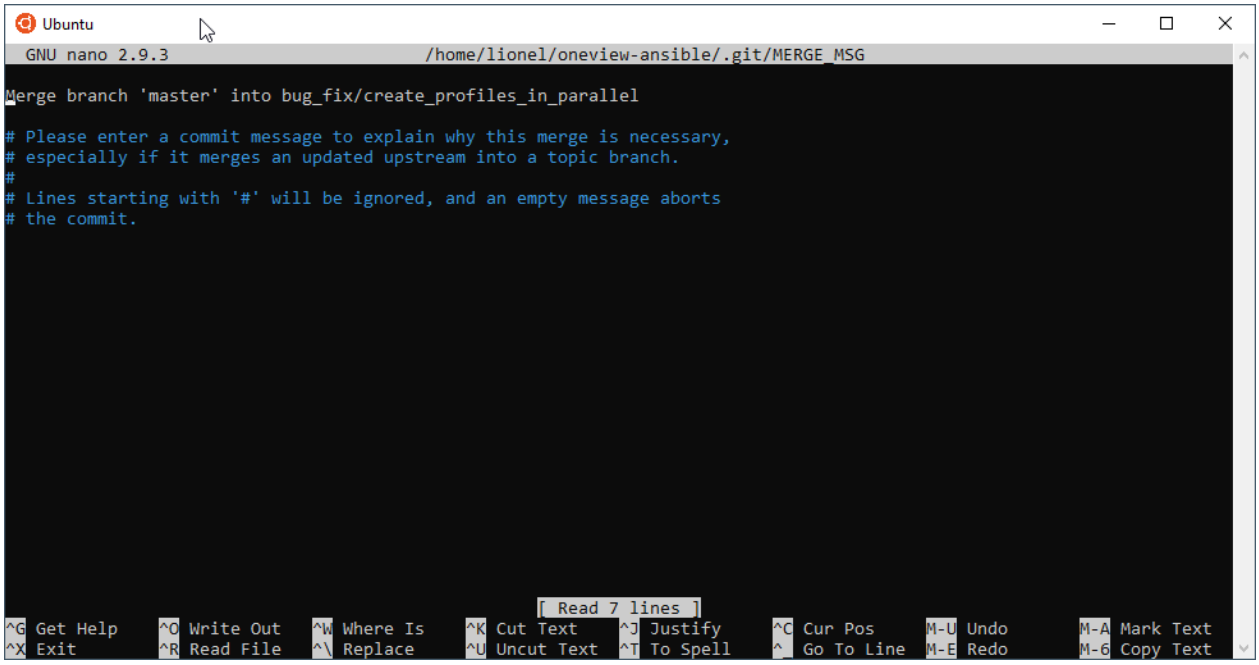
to merge the bug_fix features into the *master* branch.

Note: *git merge* merges the specified branch into the currently active branch, so we need to be on the branch that we are merging into.

Note: If you get an '*empty ident name not allowed*' error when running the *git merge* command, then you need to set a git account, it could be a fake one like:

```
git config --global user.name "hpe"
git config --global user.email "hpe@synergy.lab"
```

- The following nano editor should open:



- Just save the commit information by pressing **CTRL** + **O** then press **Enter** to save the file.
- Then press **CTRL** + **X** to exit the editor.

  From the output, we can see that two files have been changed to implement the new fixes from the *bug_fix* branch:

```
lionel@MIC2FZV4RN:~/oneview-ansible$ git merge bug_fix/create_profiles_in_parallel
Auto-merging library/oneview_server_profile.py
Auto-merging library/module_utils/oneview.py
Merge made by the 'recursive' strategy.
 library/module_utils/oneview.py    | 1 +
 library/oneview_server_profile.py | 5 +++--
 2 files changed, 4 insertions(+), 2 deletions(-)
lionel@MIC2FZV4RN:~/oneview-ansible$
```

- If you type now

```
git checkout master
```

  You should see that our *master* branch is now ahead of the origin branch by 2 commits:

```
lionel@MIC2FZV4RN:~/oneview-ansible$ git checkout master
Already on 'master'
Your branch is ahead of 'origin/master' by 2 commits.
  (use "git push" to publish your local commits)
lionel@MIC2FZV4RN:~/oneview-ansible$
```

We are good now in term of content and bug fixes, we can now continue with the Ansible module configuration.

The next step is to set persisting environment variables, let's modify the Ubuntu user profile.

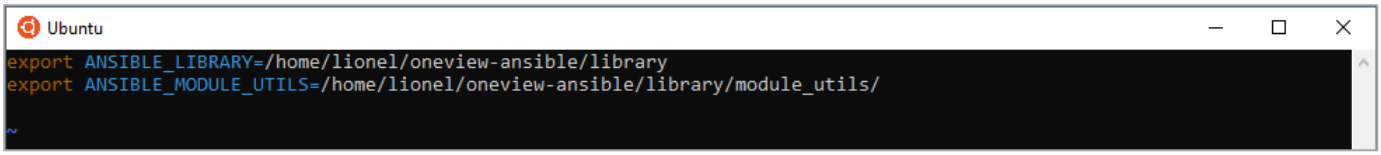
- Type:

```
vi ~/.bash_profile
```

- Then add the following lines (press the letter **i** to put the VI editor in *Insert* Mode then copy/paste, then press **ESC** to exit *Insert* Mode, then type **:** (colon) to open the vi command prompt, type **wq** and press **ENTER** to Write and Quit vi):

```
export ANSIBLE_LIBRARY=/home/<username>/oneview-ansible/library
export ANSIBLE_MODULE_UTILS=/home/<username>/oneview-ansible/library/module_utils/
```

Note: Make sure you modify *<username>* with the username you have defined.



- To immediately apply the new environment variables, type:

```
source ~/.bash_profile
```

- Then finally configure the OneView appliance connection settings that will be used by the Ansible Modules for HPE OneView. Go back to your user home directory:

```
cd ..
```

- Then create a **oneview_config.json** file with our appliance information:

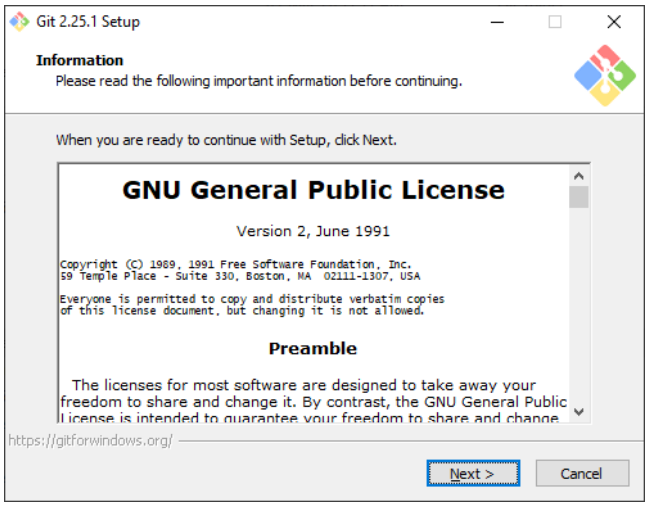
```
cat > oneview_config.json <<- "EOF"
{
    "ip": "192.168.56.101",
    "api_version": 1200,
    "credentials": {
        "userName": "administrator",
        "authLoginDomain": "",
        "password": "password"
    }
}
EOF
```

Installing Git for VS Code source control

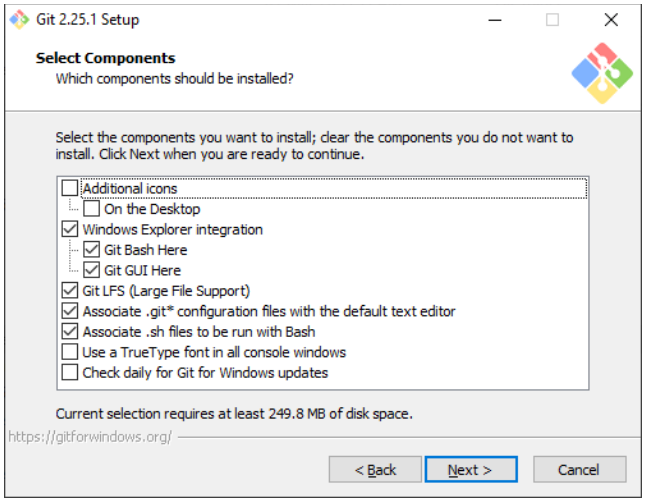
Visual Studio Code does come with an integrated Git source control provider. However, for that to work, Git itself needs to be installed on your Windows system as well.

We are going to use Git in the PowerShell project to clone GitHub repositories in our VS Code workspace but also to make sure we always have the latest content that is regularly published by the developers. For the Linux/Ansible project, we will use the Git in Ubuntu WSL.

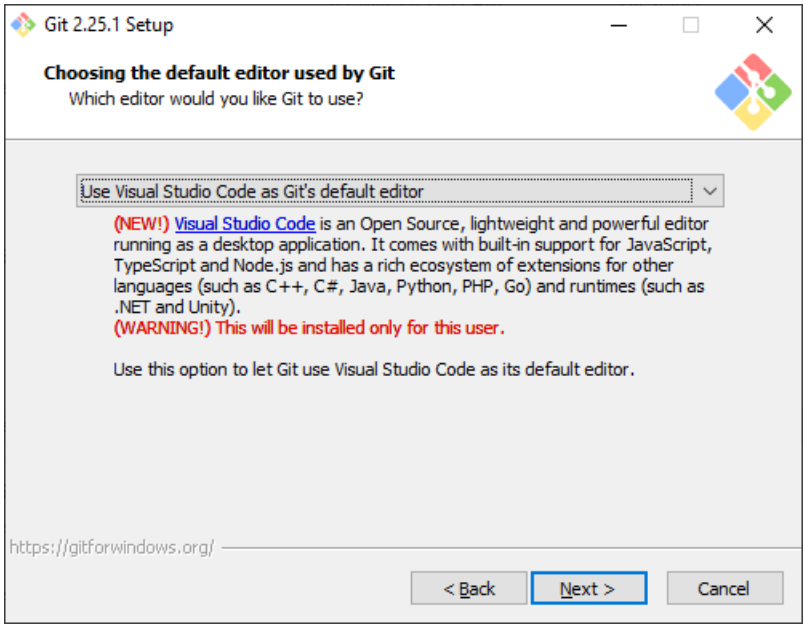
- Go to https://git-scm.com/ and download and install Git on your machine.
- Select **Windows** and launch the installation:



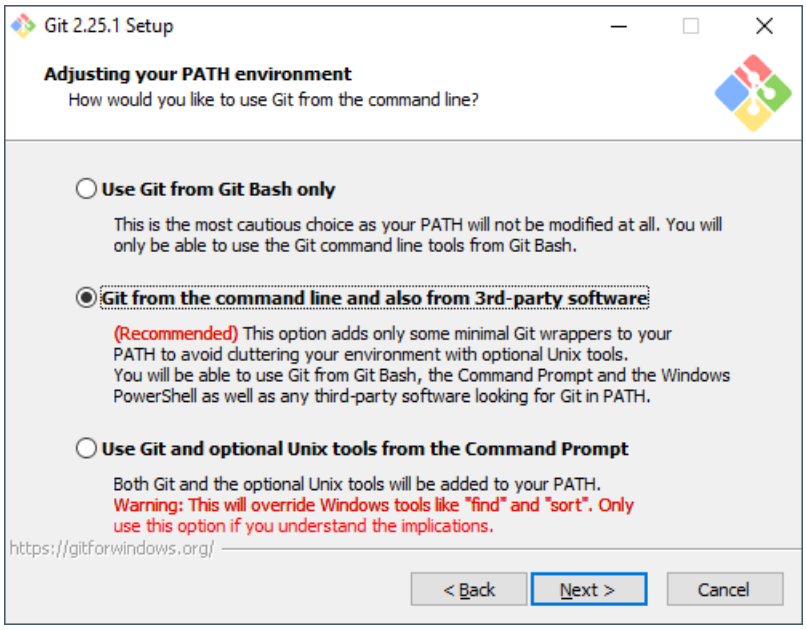
- Keep the proposed default components selected



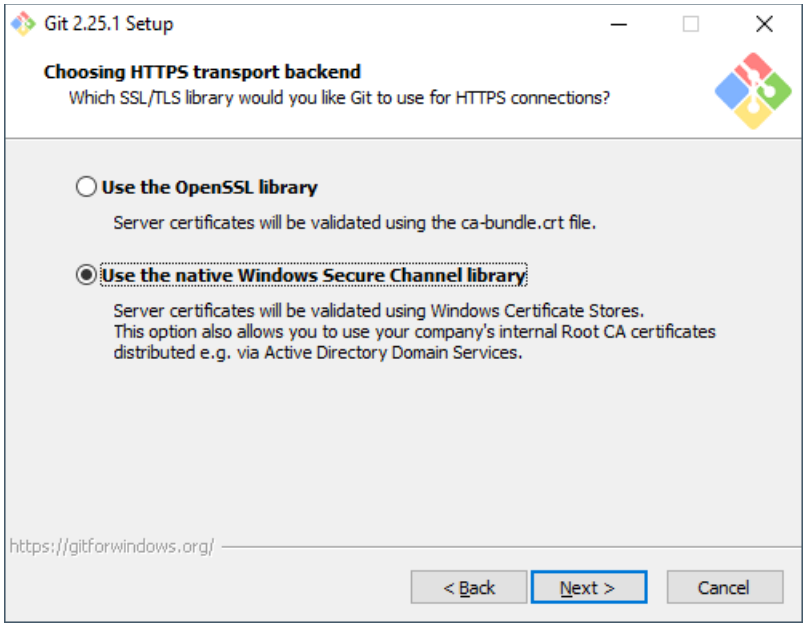
- Choose Visual Studio Code as Git's default editor option



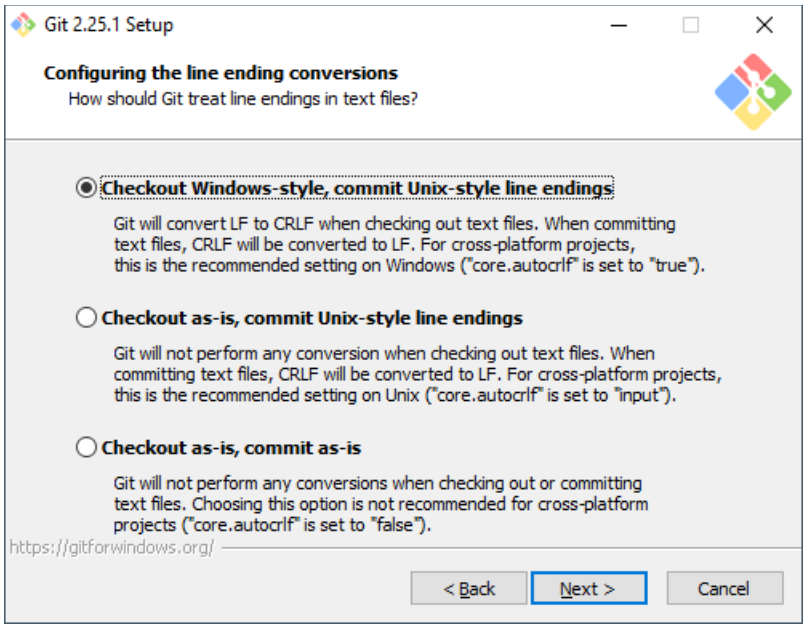
- Keep the recommended PATH environment option selected



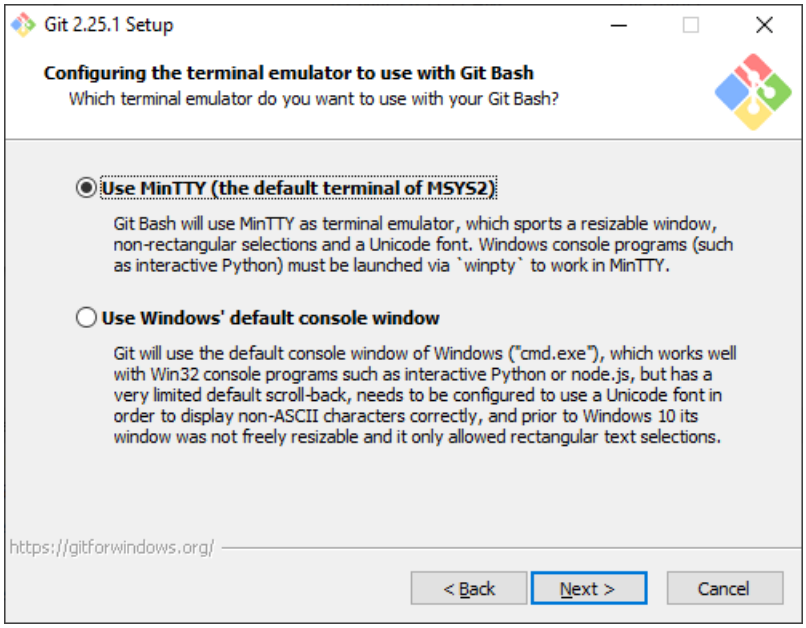
- Use the proper HTTPS transport backend option according to your environment. For HPE employees, I would recommend using the native **Windows Secure Channel library**:



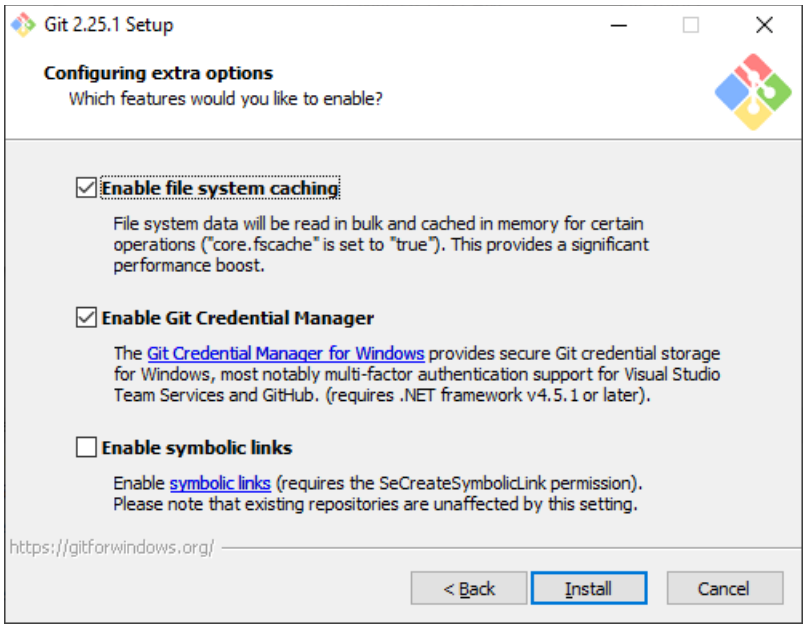
- Use the **Checkout Windows-style** as it is the recommended setting on Windows:



- Keep the default **MinTTY** option for the terminal emulator dialog



- Keep the default extra options



Once the installation is completed, restart Visual Studio Code to activate Git.

Where do my files live in my Ubuntu WSL?

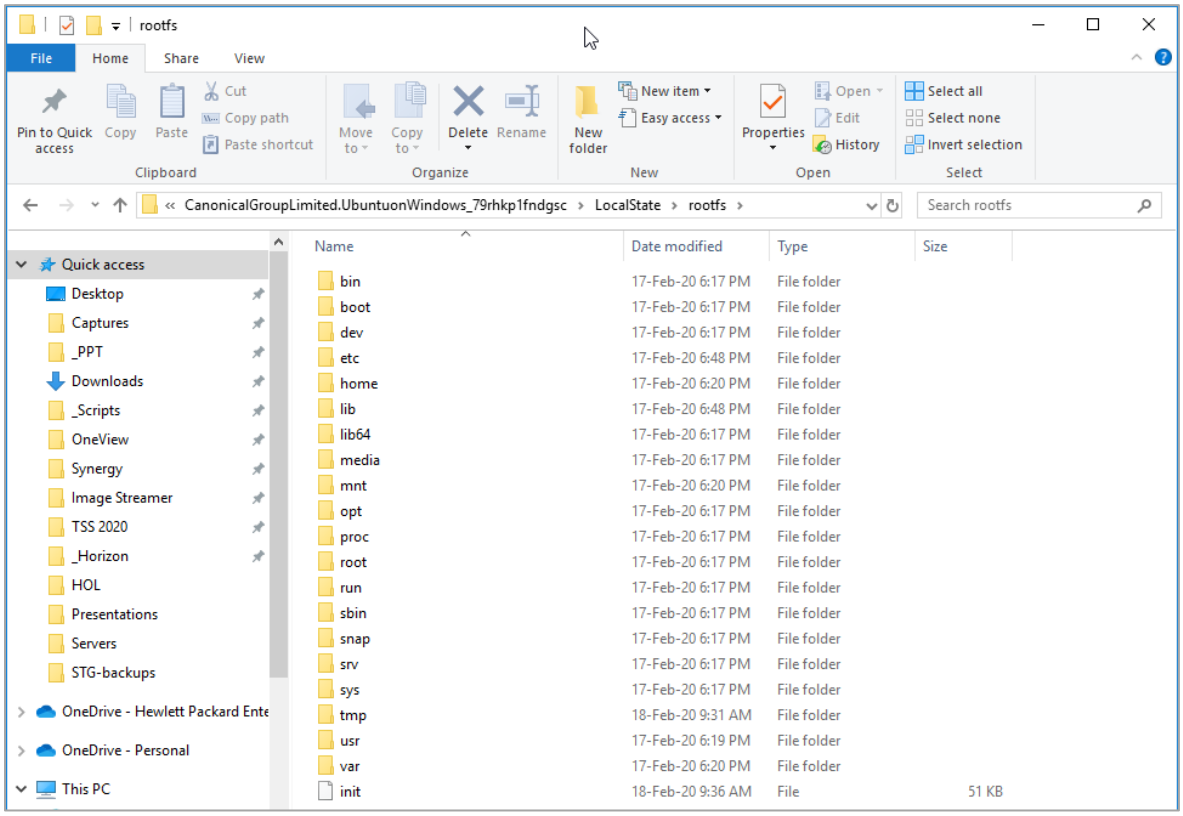
An Ubuntu WSL and a normal Linux distribution are a little different.

`/mnt/c/` shortcut maps to c:\Windows drive

```
lionel@MIC2FZV4RN:~/oneview-ansible$ cd /mnt/c/
$GetCurrent/                    PerfLogs/                   System Volume Information/
$Recycle.Bin/                   Program Files/              Temp/
Config.Msi/                     Program Files (x86)/        Users/
FFOutput/                       ProgramData/                Windows/
GAC_MSIL/                       Quarantine/                 Windows.old/
HP/                             Recovery/                   Windows10Upgrade/
HPSDM/                          SCS S-1/                    inetpub/
HP_Color_LaserJet_Pro_MFP_M477/ SWSetup/                    system.sav/
Intel/                          SY_dcs-master/
OneDriveTemp/                   SoftPaqDownloadDirectory/
```

If you want to save your work in your Windows User Home directory, you can simply save your file to the `/mnt/c/Users/<windowsusername>/Documents`

Note: Ubuntu root directory is located on your Windows file system in a hidden folder inside your User AppData directory:
%USERPROFILE%\AppData\Local\Packages\CanonicalGroupLimited.UbuntuonWindows_xxx\LocalState\rootfs



Warning: Don't open/edit any files here from Windows. Just ignore the files here. Editing any files from Windows can damage your Linux distro.

Note: If you need to copy a file from your Windows file system to WSL, it is recommended to use `cp /mnt/c/<path> /home/<username>` from WSL to avoid messing up with Linux read/write permission access

This concludes Chapter-2, our Ubuntu configuration is complete and ready to be used. In the next chapter, we will install and configure VS Code.

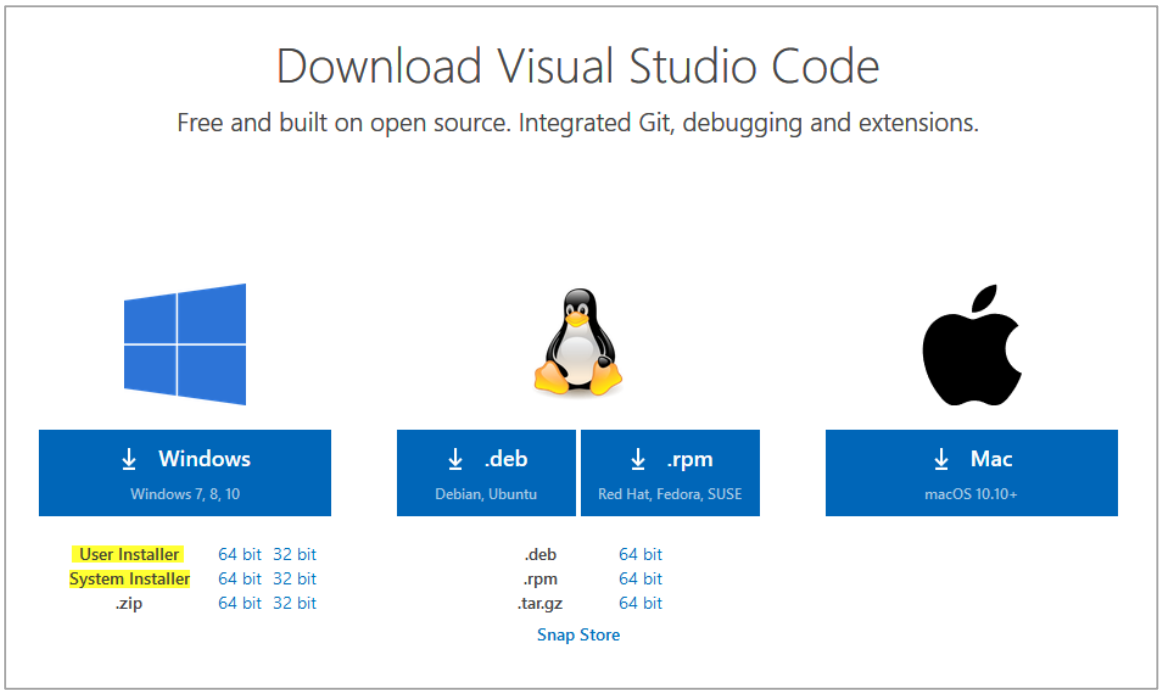
Chapter-3 – Preparing Microsoft Visual Studio Code

Installing Visual Studio Code

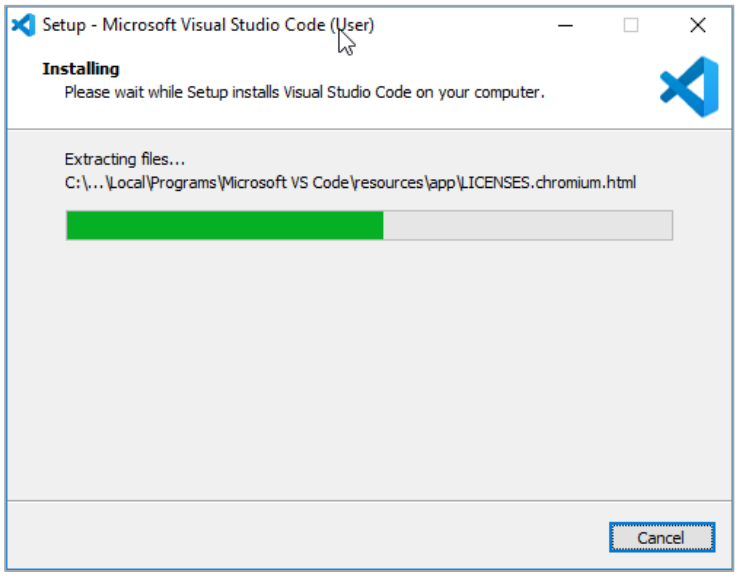
Visual Studio Code (also known as VS Code) is one of the most popular software for source-code editing developed by Microsoft. It includes many good features for debugging, it supports embedded Git control and GitHub, syntax highlighting, intelligent code completion, snippets, and code refactoring.

If you want to edit and run scripts to impress your customer, Visual Studio Code is one of the main tools you need to have in your demo toolbox.

- If not already, you can install VS Code from https://code.visualstudio.com/Download
- You can either select *User* or *System installer*. *System installer* does just install VS Code for all users in your system.

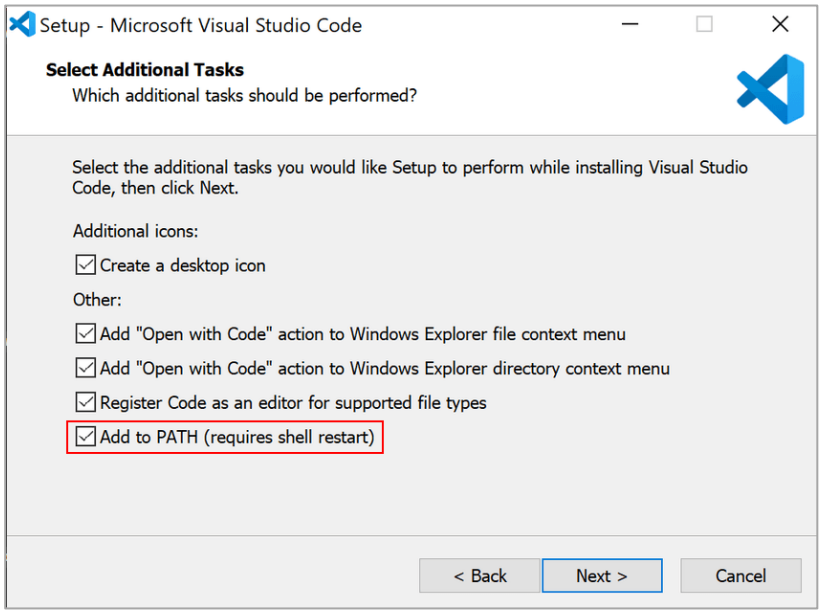


- You can proceed with the installation using all default parameters.



Note: If you need to learn more about VS Code, you can watch the introductory videos available at https://code.visualstudio.com/docs/getstarted/introvideos or read the Next Steps section at https://code.visualstudio.com/docs/setup/windows#_next-steps

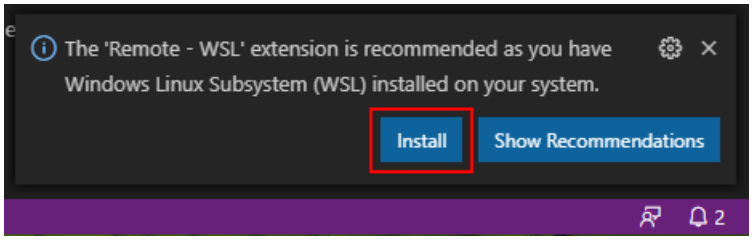
- When prompted to **Select Additional Tasks** during installation, be sure to check the **Add to PATH** option so you can easily interact with WSL.



- When completed, launch **VS Code**.

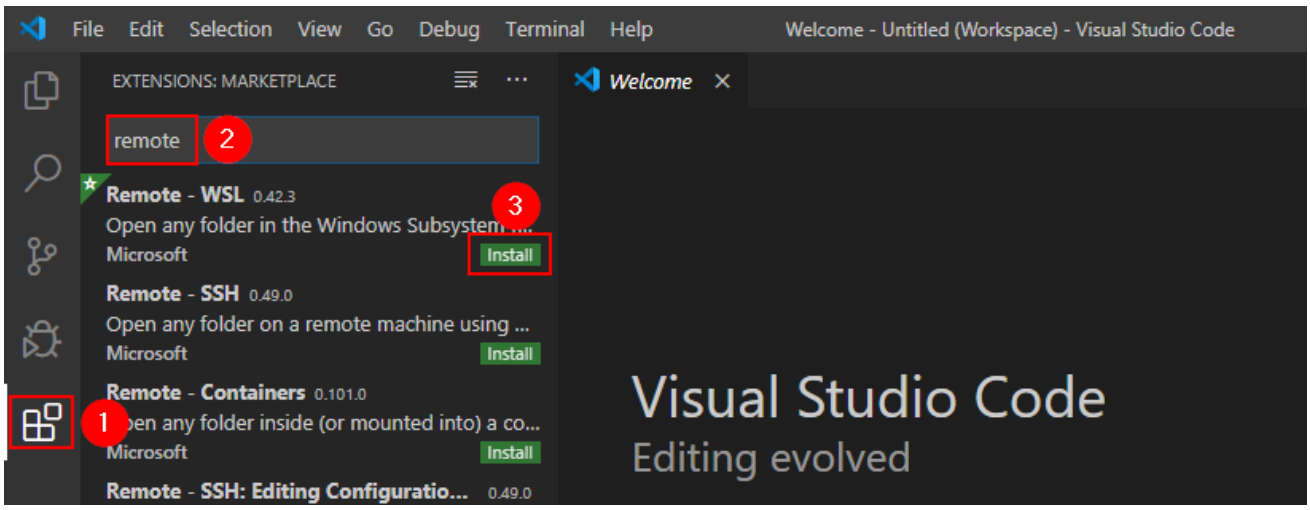
When VS Code is opening, you should notice a warning message saying "The 'Remote - WSL' extension is recommended as you have Windows Linux Subsystem (WSL) installed on your system"

- Click on **Install**

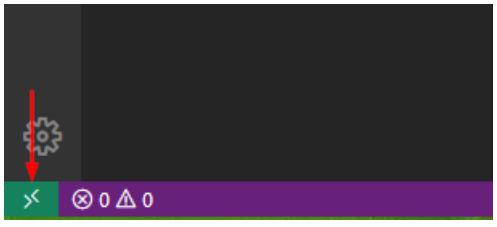


This is the extension that VS Code need to connect to our Ubuntu runnning in the Windows Subsystem for Linux.

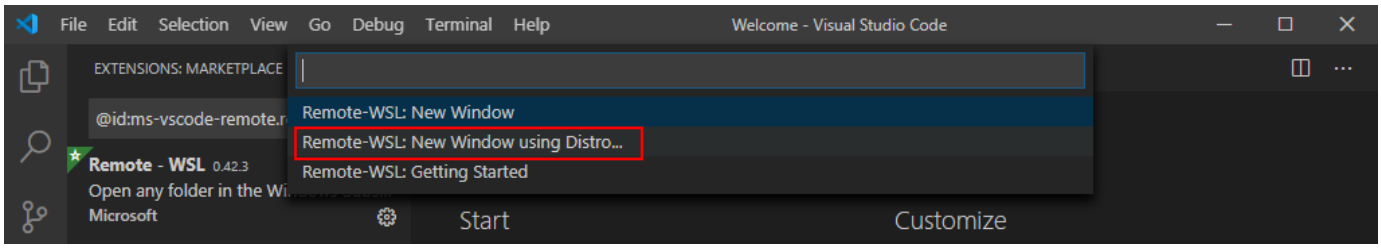
Note: If the message is not appearing, you can install manually this extension by clicking on the **Extensions** icon on the Activity bar and search for **Remote – WSL**



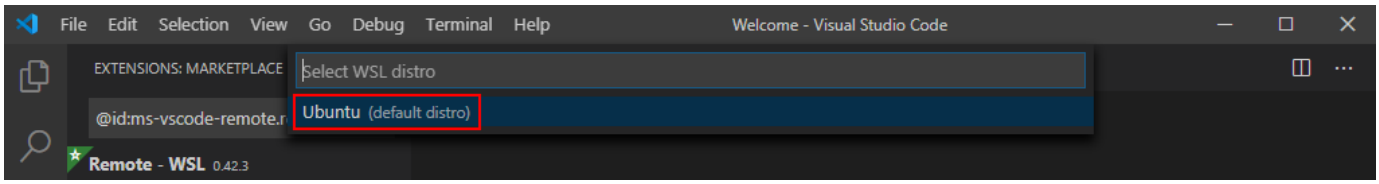
- Once installation completed, click on the Remote "Quick Access" status bar item in the lower left corner to get a list of the most common commands.



- Select **Remote-WSL: New Window using Distro...**



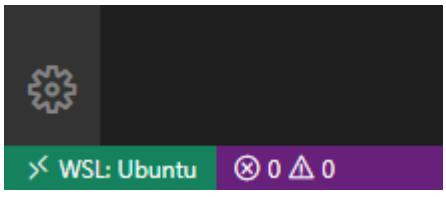
- Then select **Ubuntu**



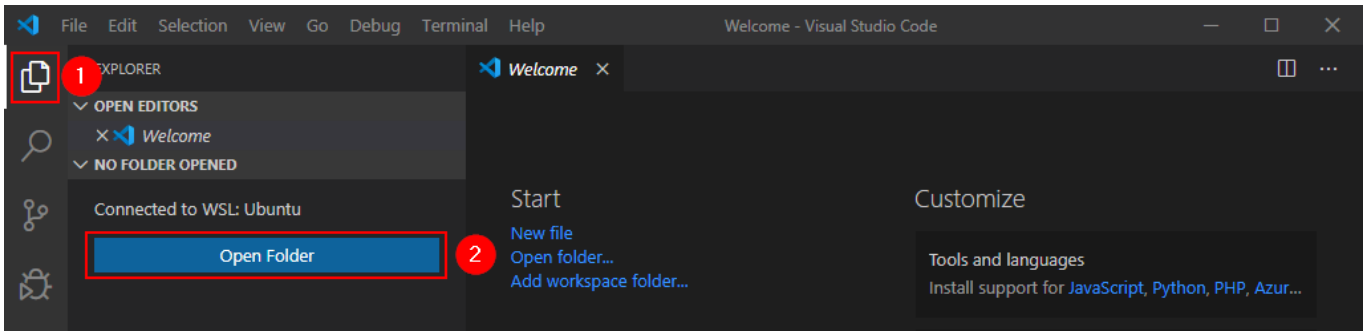
- A Remote connection to Ubuntu is taking place in a new VS Code window:

- You can close the previous VS Code window.

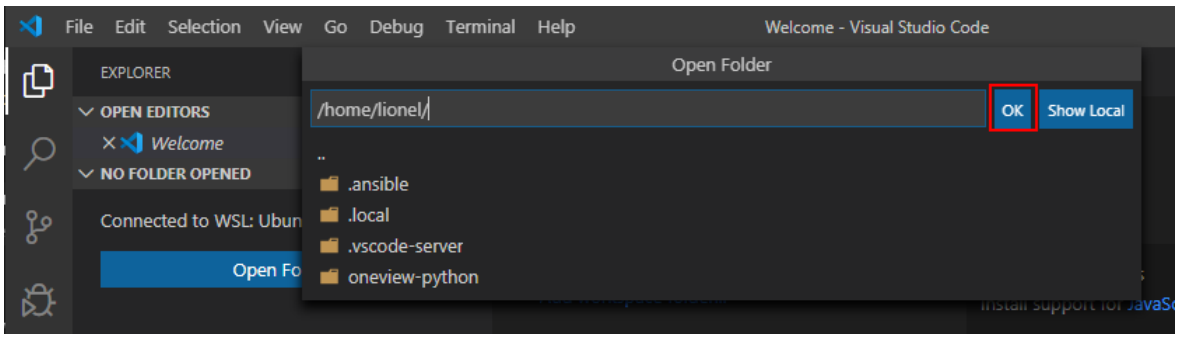
- Once connected, in the lower left corner of the Status Bar, you shoud see that you're connected to your WSL: Ubuntu instance.



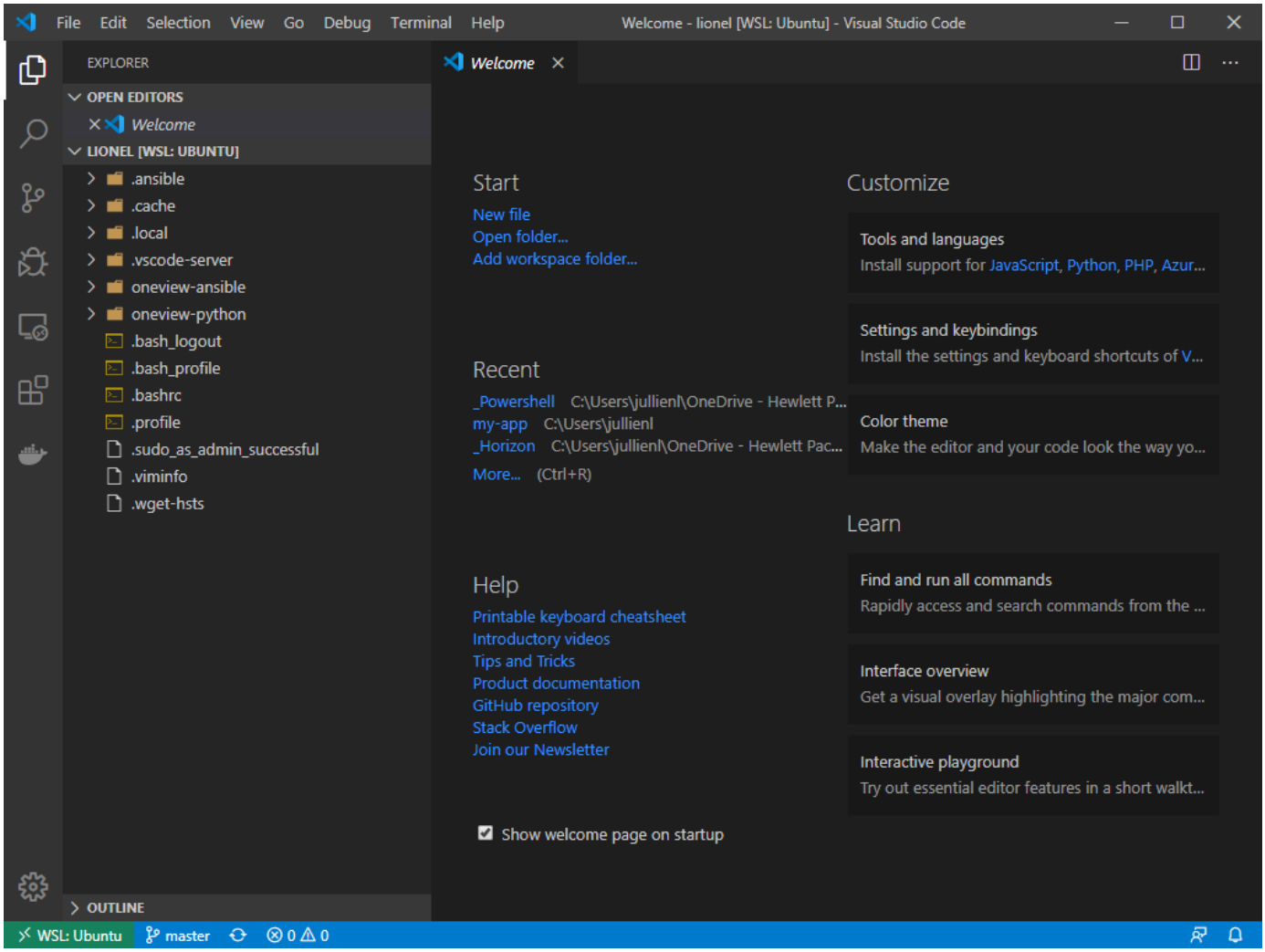
- You can then open a folder located on the WSL:Ubuntu using the **Explorer** icon on the Activity bar



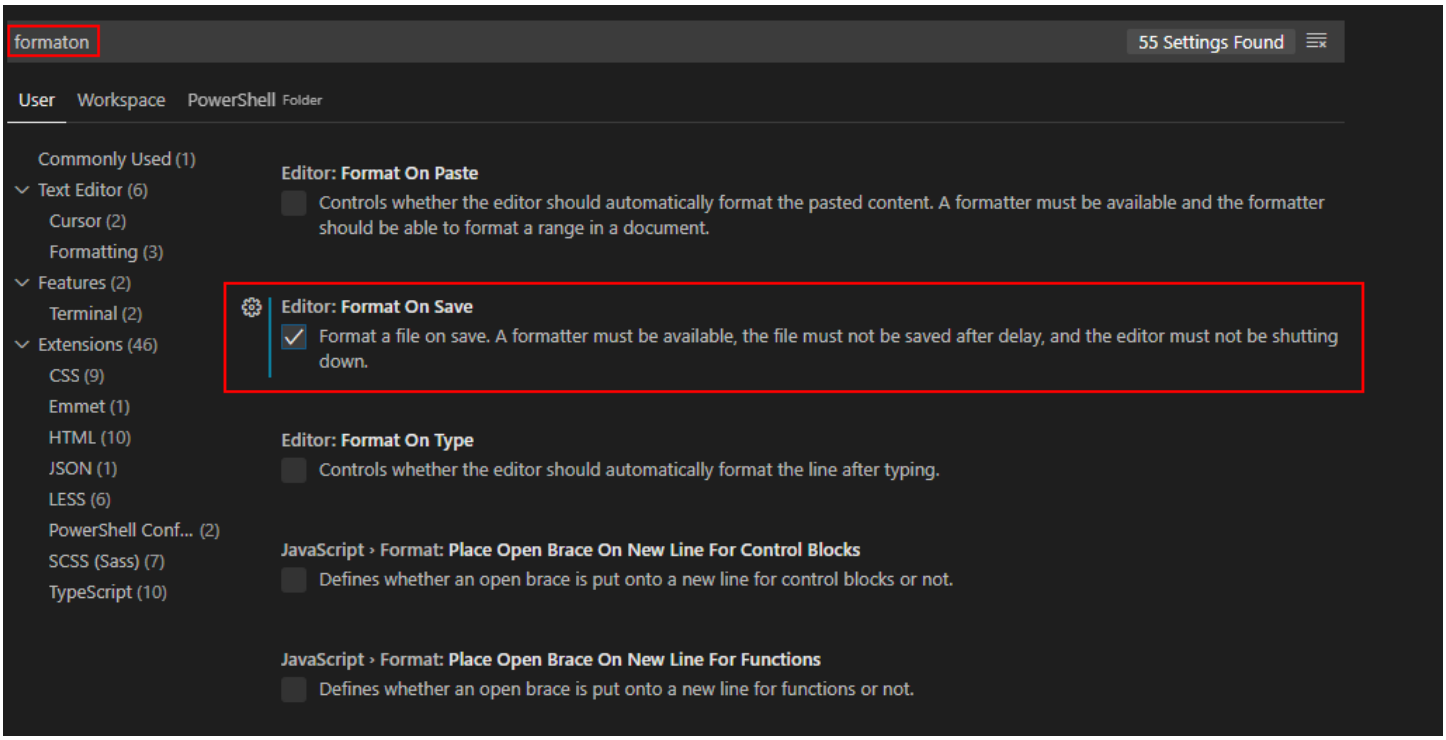
- Click **OK** to the `/home/<username>` folder



- The Ubuntu user user home directory content is now available in the Explorer pane:

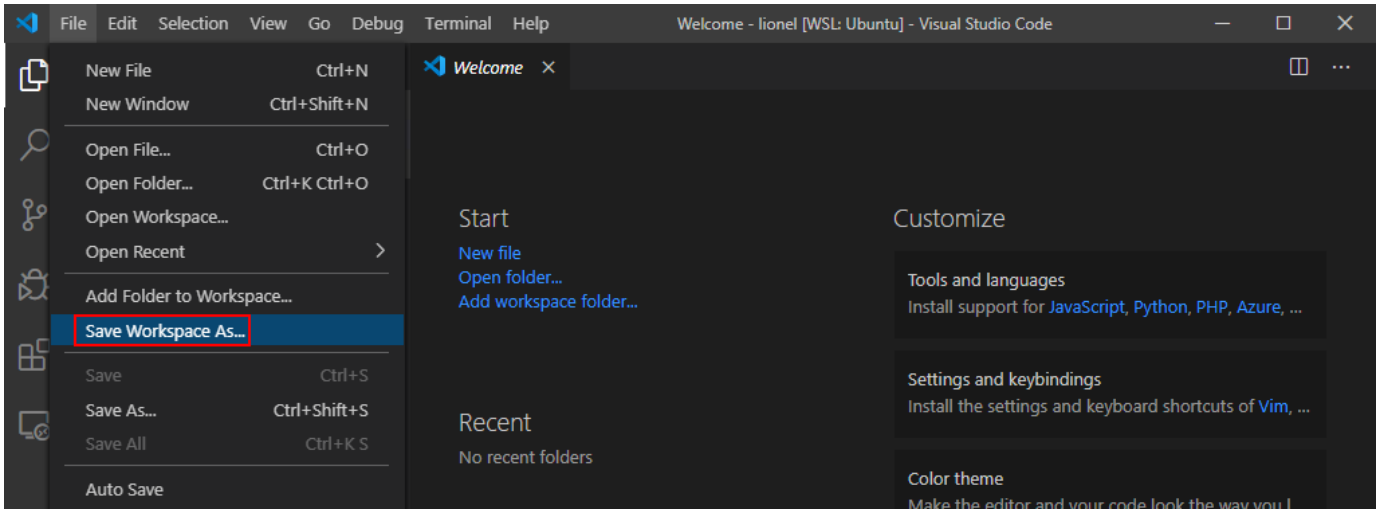


There are tons of VS Code settings that you can tweak but there is one that is really recommended when writing scripts is the **Format On Save**. This “must have” option automatically formats your code when you save your work by improving spacings, indents, by wraping lines if necessary and fixing quotes.

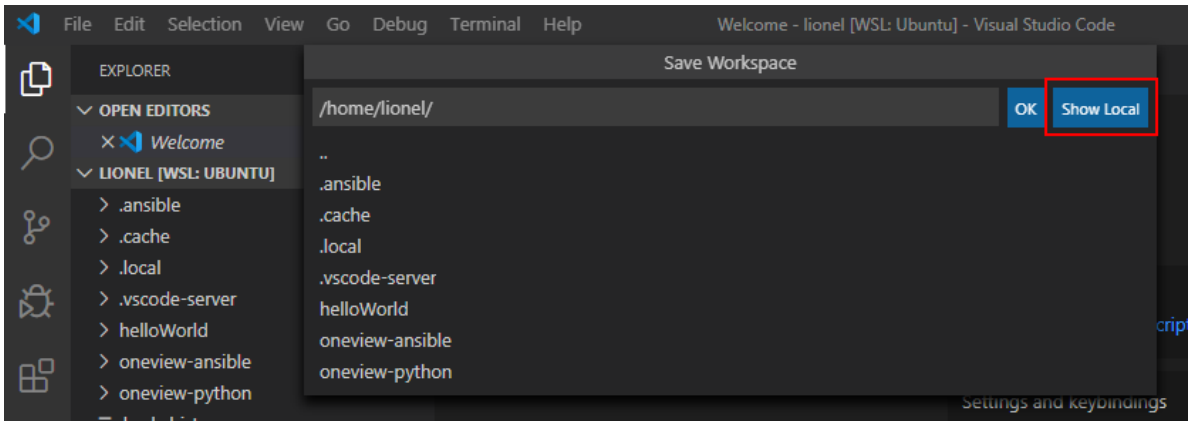


The next step is to save the current VS Code configuration in a workspace. A VS Code "workspace" is usually just your project root folder.

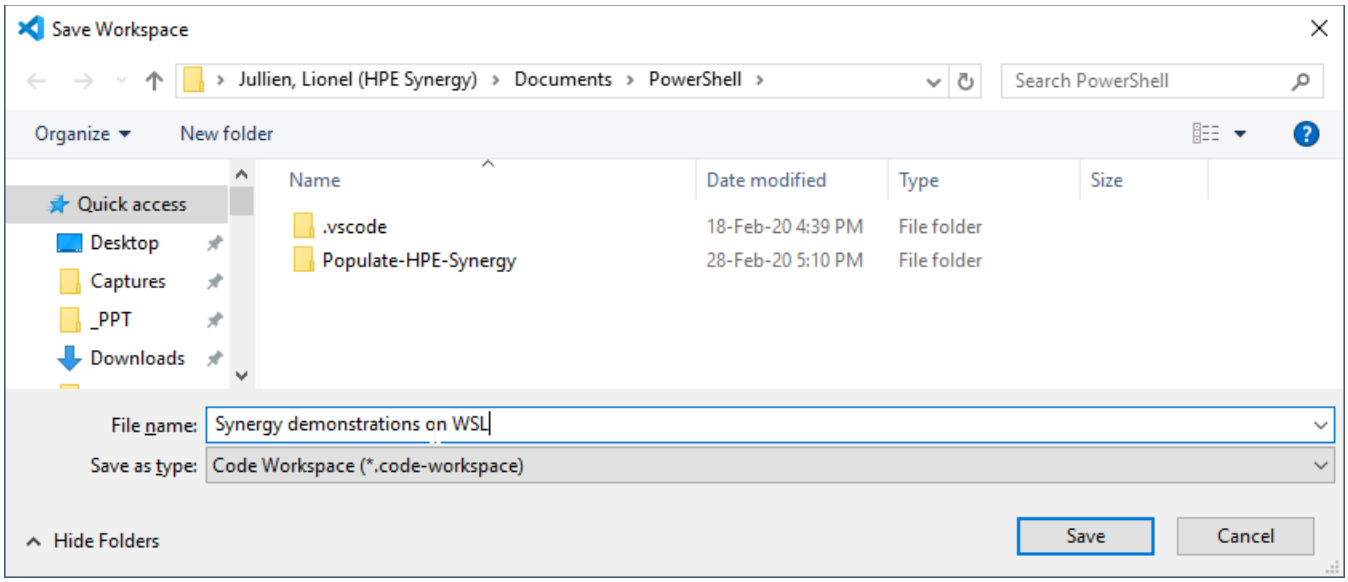
- Select **File** menu and click on **Save Workspace as**:



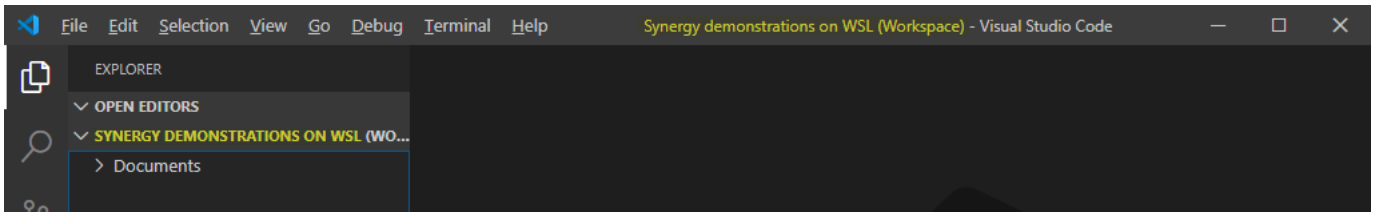
- Select **Show Local** and select a folder in your Windows Documents folder



- Select an emplacement and enter a name like **Synergy demonstrations on WSL** then click **Save**



- Now each time you open VS Code, you will find the *Synergy demonstrations on WLS* workspace with the Remote – WSL extension opening the Ubuntu folder running in the Windows Subsystem for Linux.

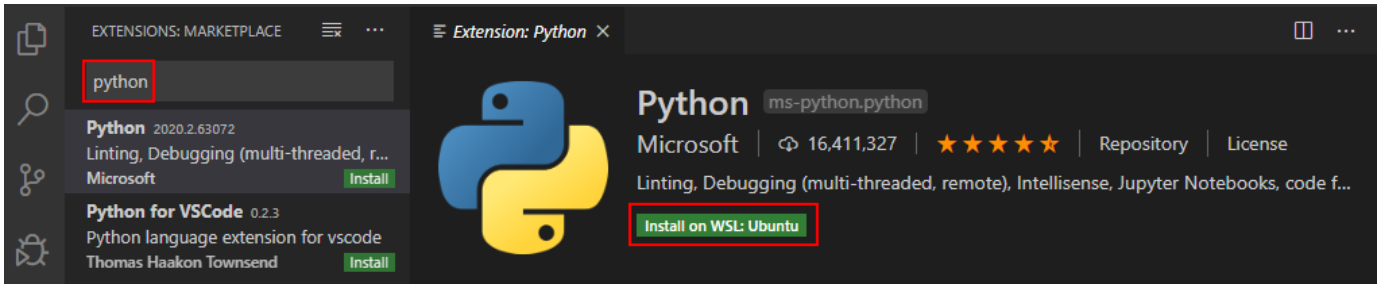


Preparing VS Code for Python

You can extend the VS Code editor experience using tons of extensions. The VS Code community has built hundreds of useful extensions available on the VS Code Marketplace.

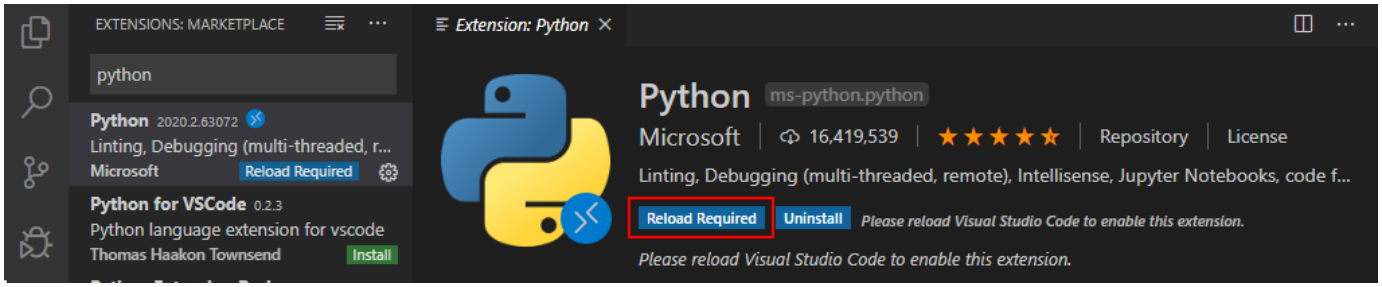
There are popular ones for PowerShell, Python, Ansible...

- Click on **Extensions** on the Activity bar, and search for **Python** and click on **Install on WSL: Ubuntu**



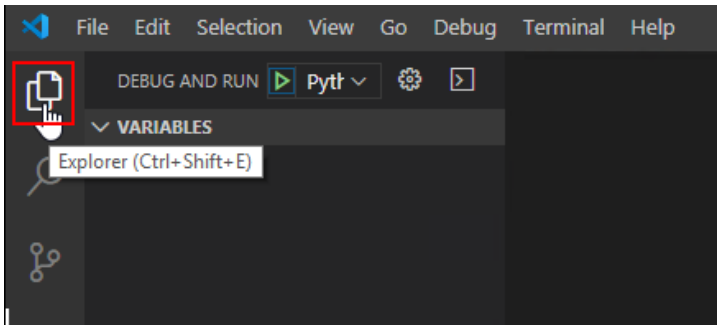
This extension provides nice advanced features like Syntax highlighting, IntelliSense, debugging, code formatting, access to module documentation, ability to run the active script file in the VS Code terminal console, etc.

- Once the installation is completed, click on **Reload Required** to activate the extension.

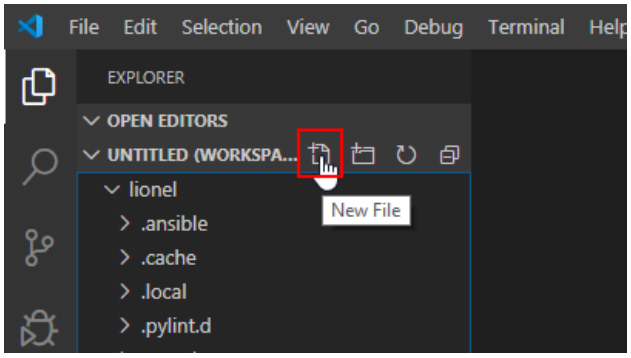


Note: For the Python extension, we are going to use the Python interpreter running in our Ubuntu Linux distribution hosted by WSL (Windows Subsystem for Linux). Another good option if you don't want to use WSL would be to run Python directly on your Windows system, see https://www.python.org/downloads/windows/ and https://docs.microsoft.com/en-us/windows/python/beginners

- Let's now test the Python interpreter, click now on **Explorer** on the Activity Bar

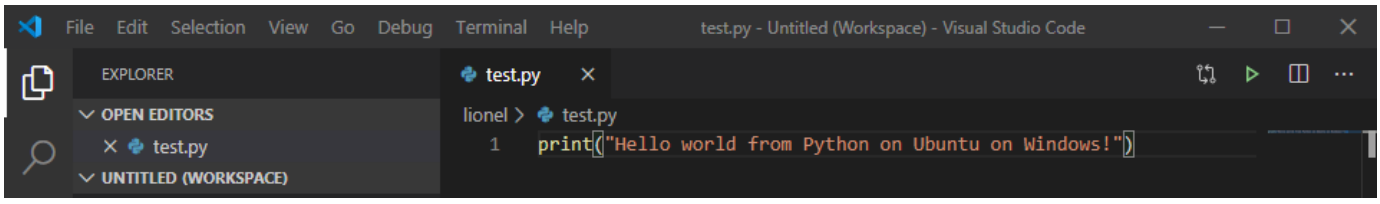


- Then click on **New File**



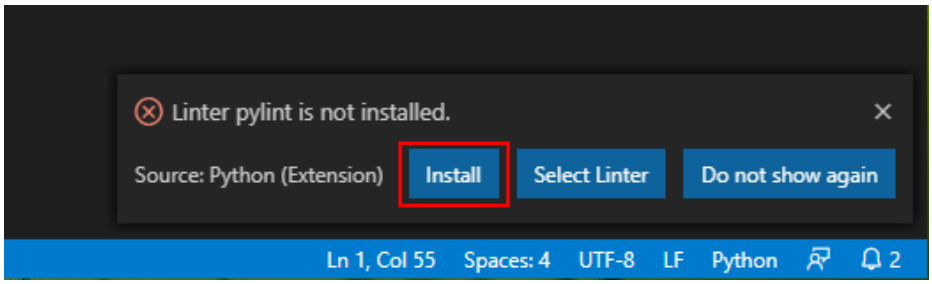
- Enter a name like **test.py** then press **ENTER**
- Enter the following line to build the Python script test.

```
print("Hello world from Python on Ubuntu on Windows!")
```



- Save the file by pressing **CTRL** + **S**

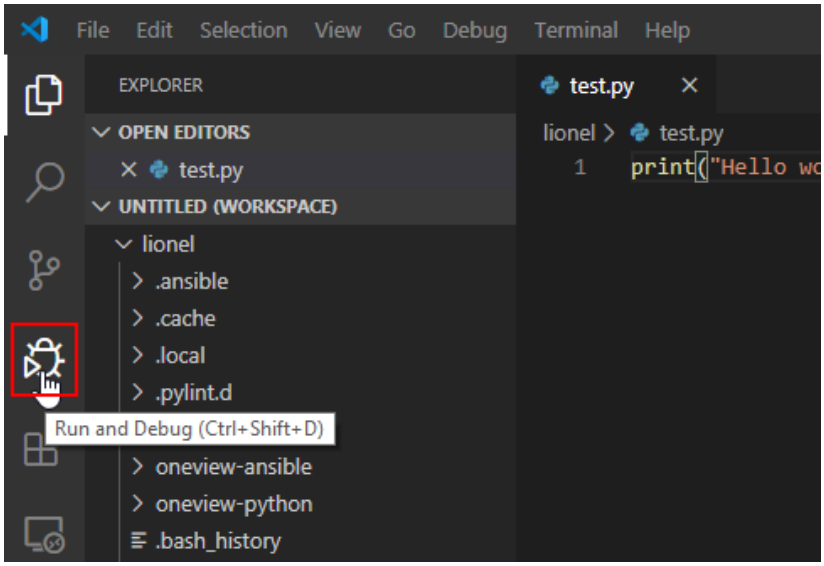
- You can install pylint by clicking on **Install** when the windows pops-up at the creation of the Python script:



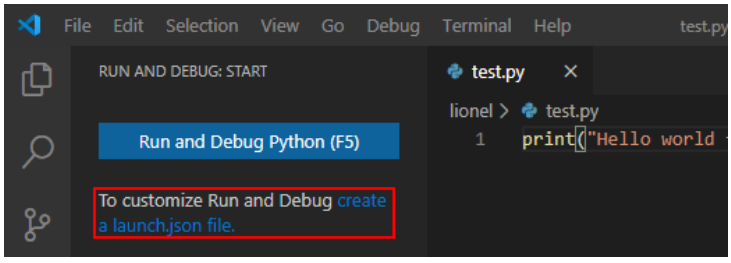
Pylint is a Python static code analysis tool which looks for programming errors, helps enforcing a coding standard, sniffs for code smells and offers simple refactoring suggestions.

Note: Behind a proxy, make sure you add `--proxy` to the command:
`/usr/bin/python3 -m pip install -U pylint --user --proxy http://web-proxy.corp.hpecorp.net:8088`

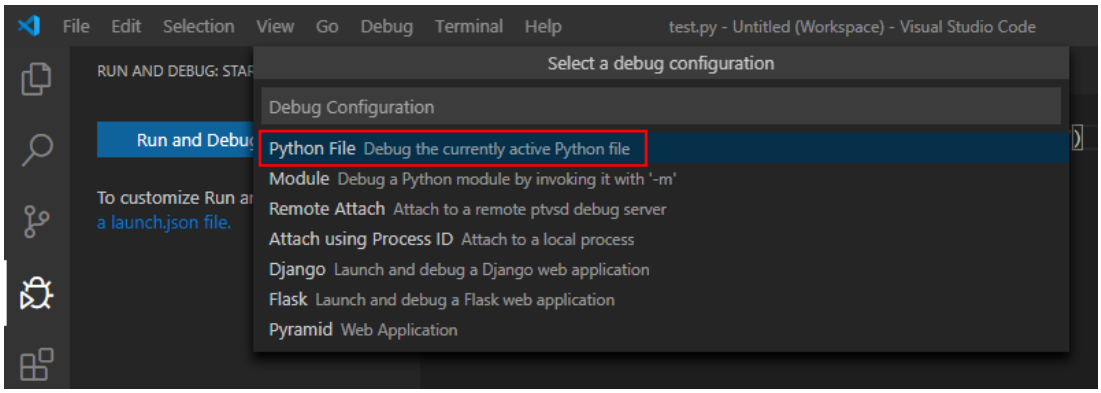
- Click on **Run and Debug**



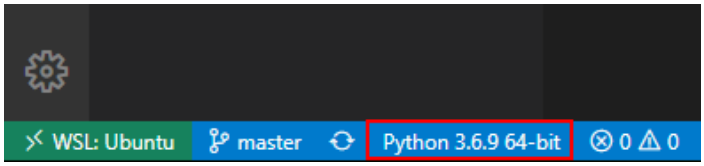
- Select **Customize Run and Debug create a launch.json file**



- Select **Python File**

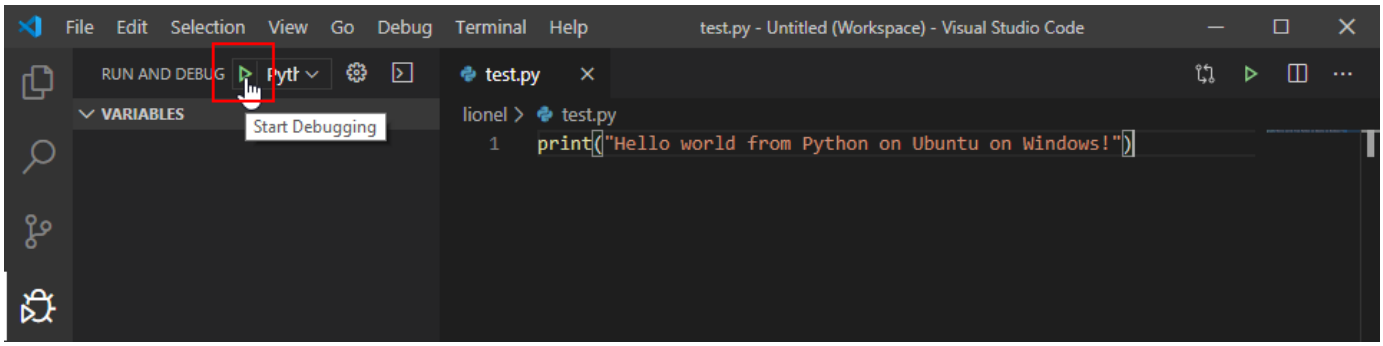


Tip: You can see the Python interpreter version in use in the status bar

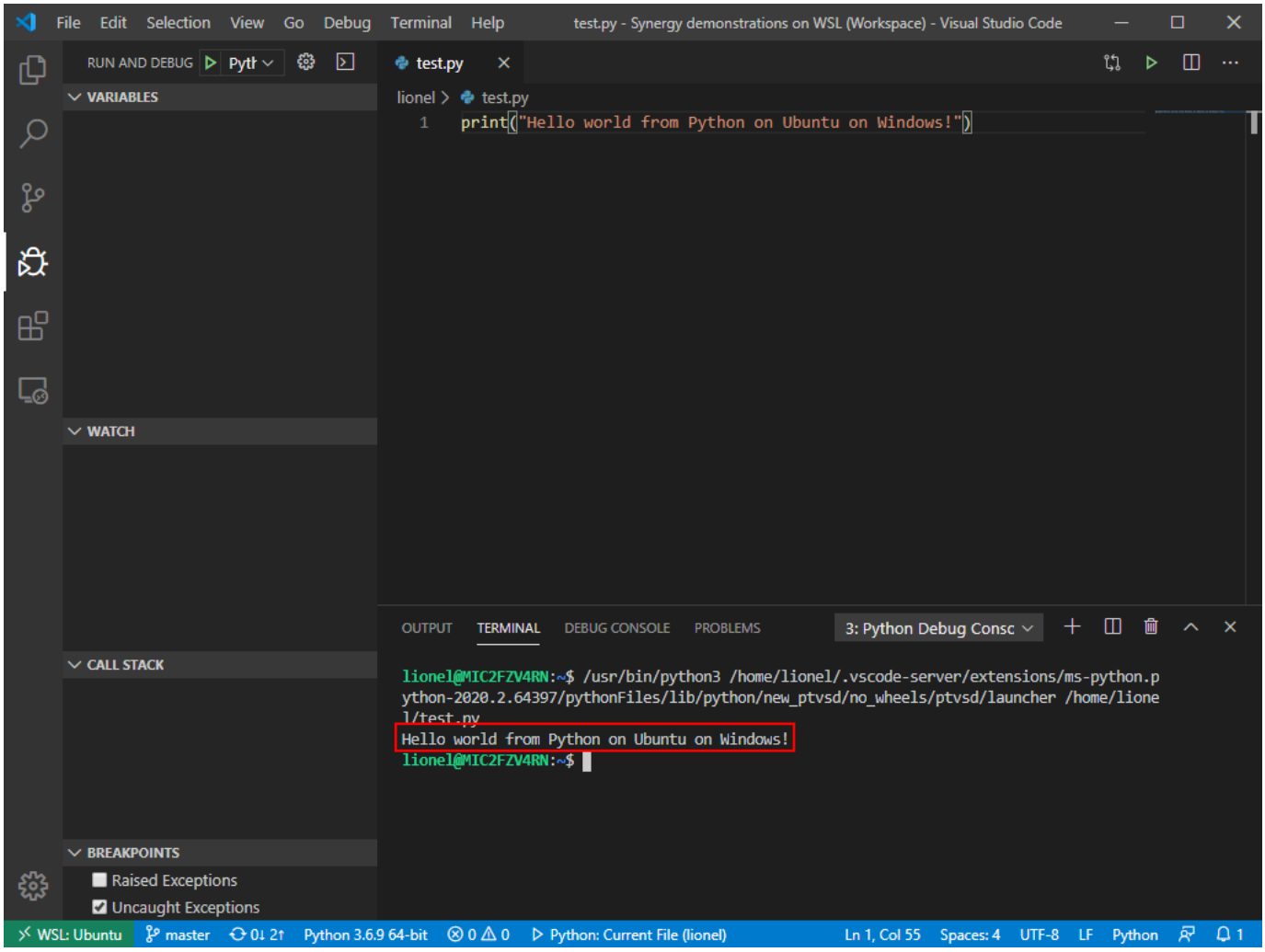


- To complete the Python debug and Run configuration, press **CTRL** + **S** to save the configuration file then **CTRL** + **F4** to close the configuration file.

- Now click on **Start Debugging**



- The VS Code console should display the *Hello world* message:

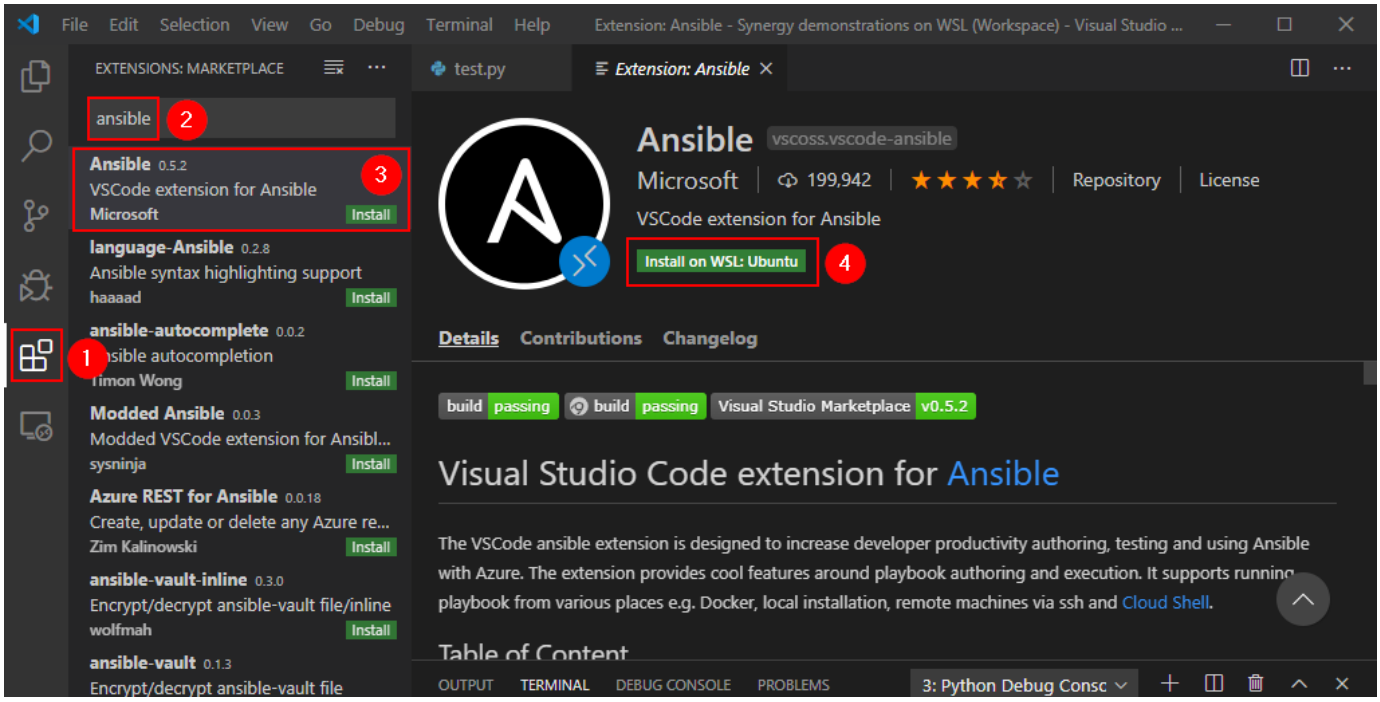


We are now all set for Python scripting and debugging.

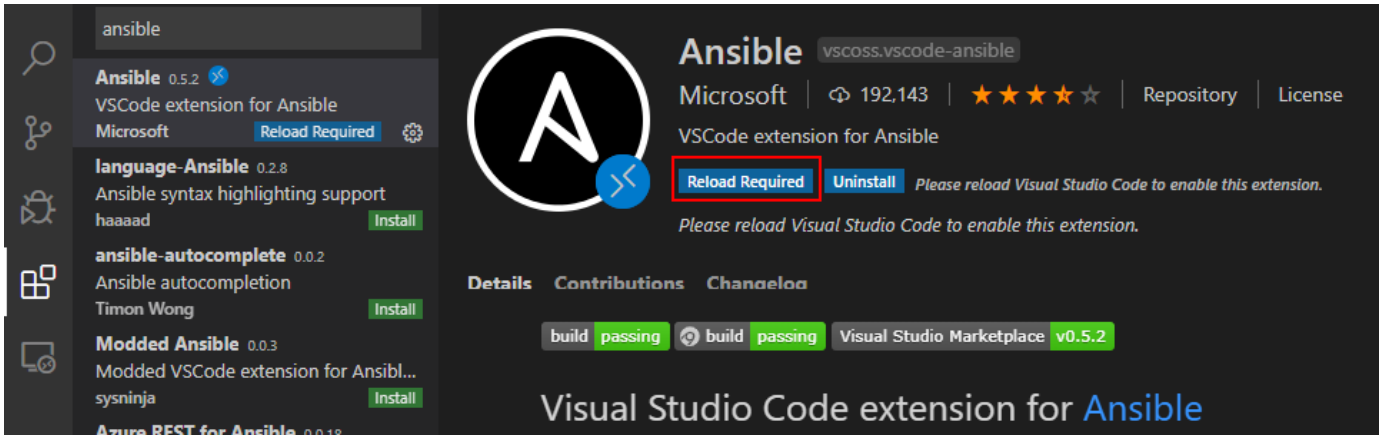
Preparing VS Code for Ansible

To extend our VS Code editor experience with Ansible, we are going to install an Ansible extension. This extension provides cool features around playbook authoring and execution and more importantly, it supports running playbook from the WSL Ubuntu instance.

- Go to the **Extensions** and search for the **Ansible** extension and install it.



- Once the installation is completed, click on **Reload Required** to activate the extension.



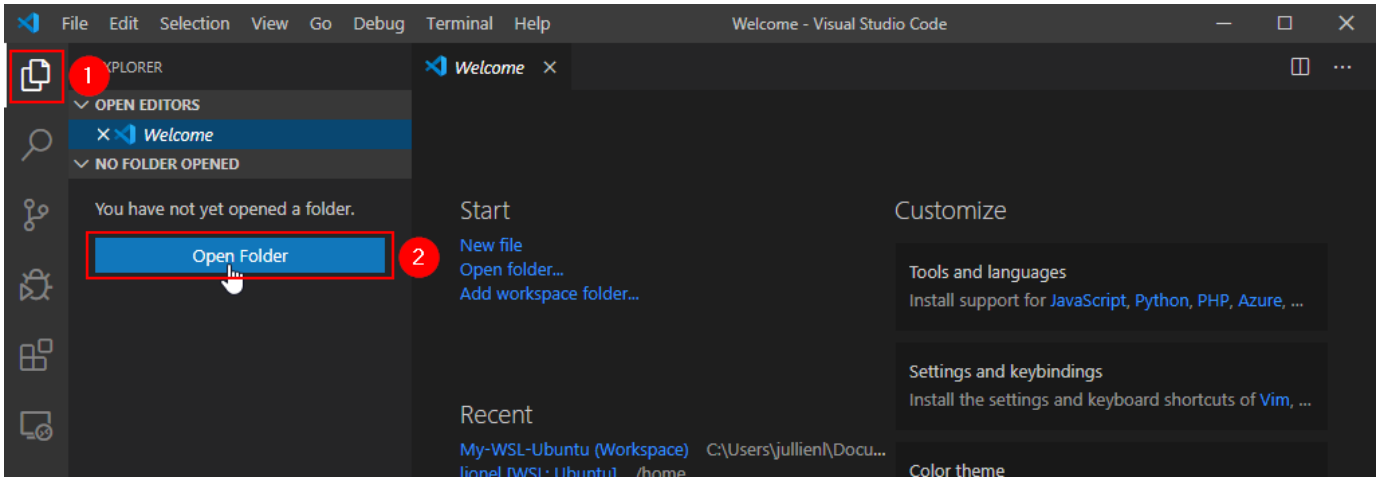
Preparing VS Code for PowerShell

Next, we can install the PowerShell extension to get also nice advanced features like Syntax highlighting, IntelliSense, debugging, code formatting, access to cmdlet documentation, ability to run the active script file in the VS Code terminal console, etc.

For PowerShell, we need to use a different VS Code workspace as we cannot mix WSL Linux oriented project with a PowerShell one:

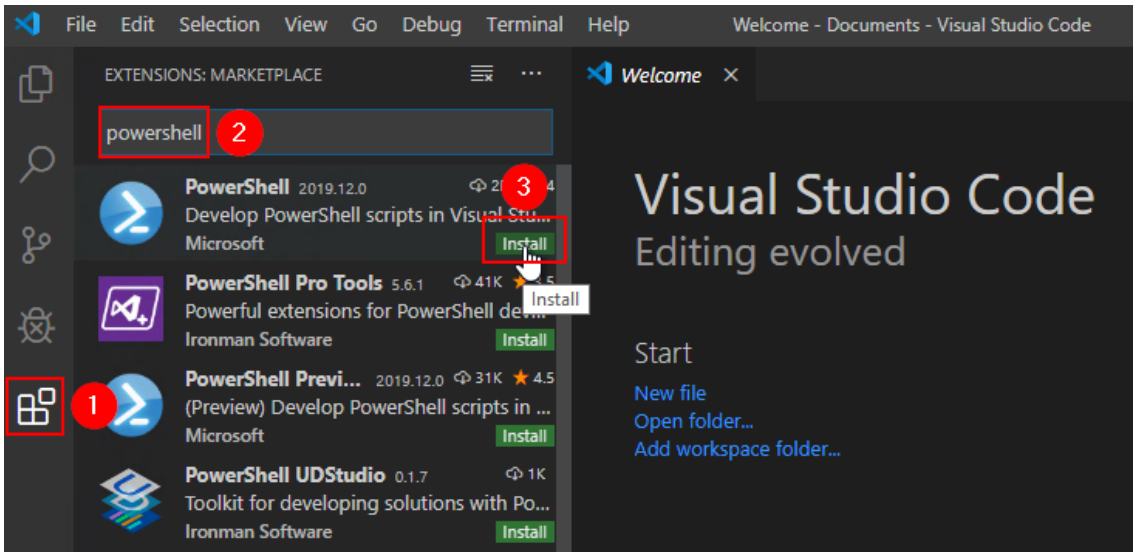
- Open a new VS Code instance by clicking on the Visual Studio Code icon on your desktop:

- Then click on the **Explorer** icon on the Activity bar and then click **Open Folder**.

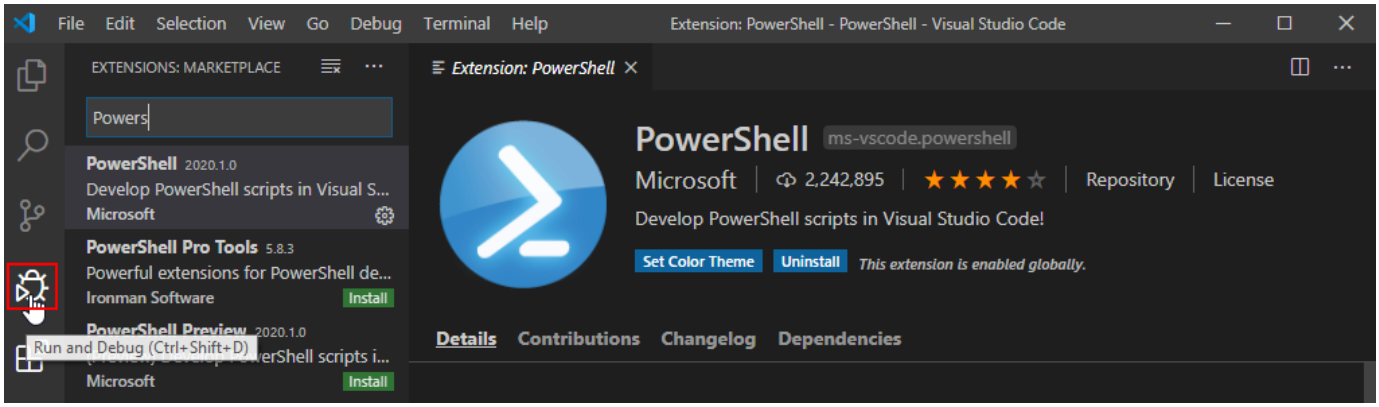


- Open the folder you want your PowerShell project to be in (e.g. \Documents\PowerShell) and click **Select Folder**.

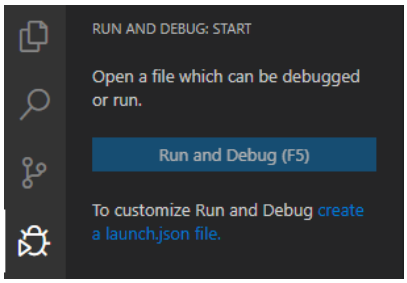
- Go to the **Extensions** pane and search for the **PowerShell** extension and click on the **Install** button:



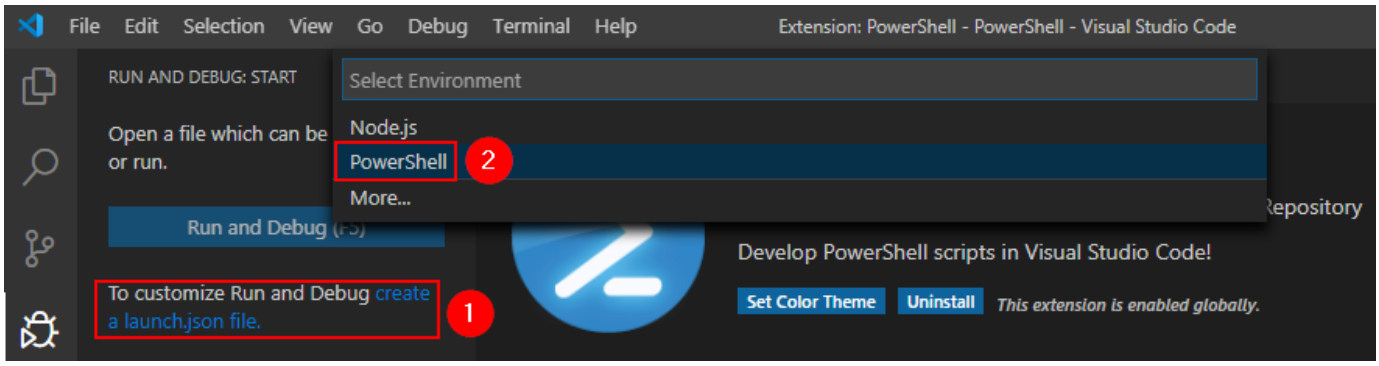
- To configure the PowerShell interpreter once the extension is installed, click on **Run and Debug** on the Activity Bar



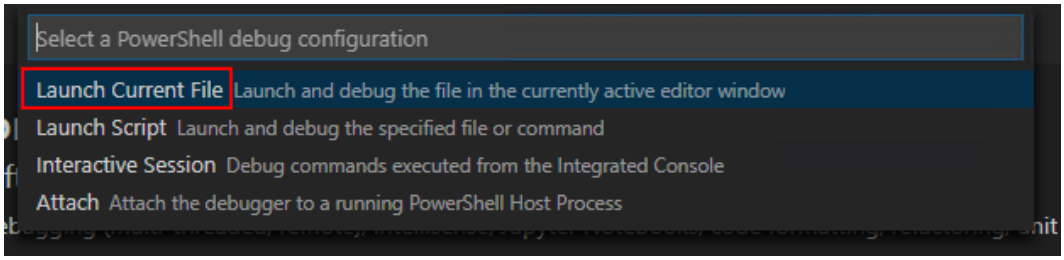
Visual Studio Code's built-in debugger needs some quick setup to run and debug PowerShell scripts. If your system is already configured, you can skip this section. When VS Code is not configured for PowerShell, the following dialog is displayed:



- Click on **Create a launch.json file** to configure Run and Debug, then select **PowerShell**

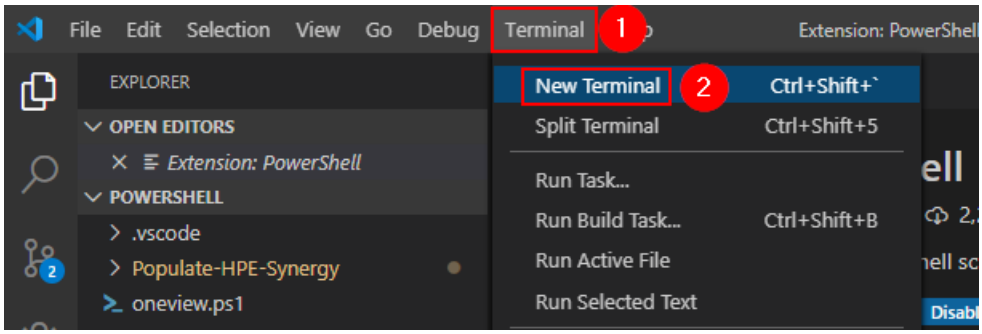


- Then select **Launch Current File**

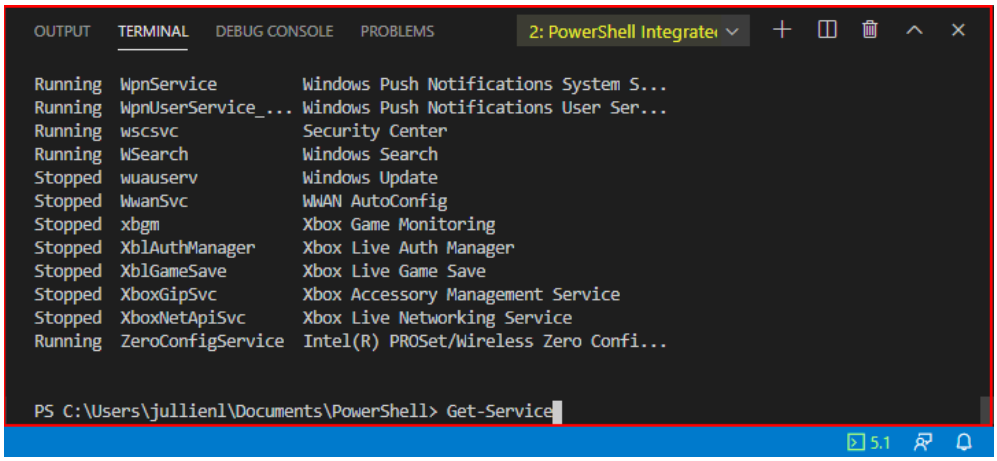


- Then press **CTRL** + **S** to save the configuration file then **CTRL** + **F4** to close the configuration file.

- Select now **Explorer** in the activity bar, a PowerShell Integrated console should start, or you can select **Terminal** / **New Terminal**

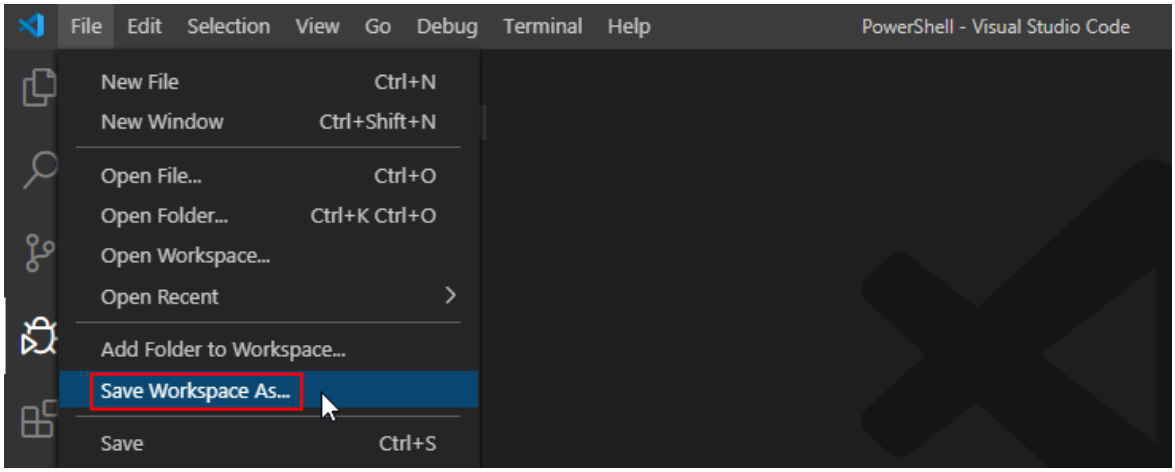


- You can enter **get-service** to make a quick test:

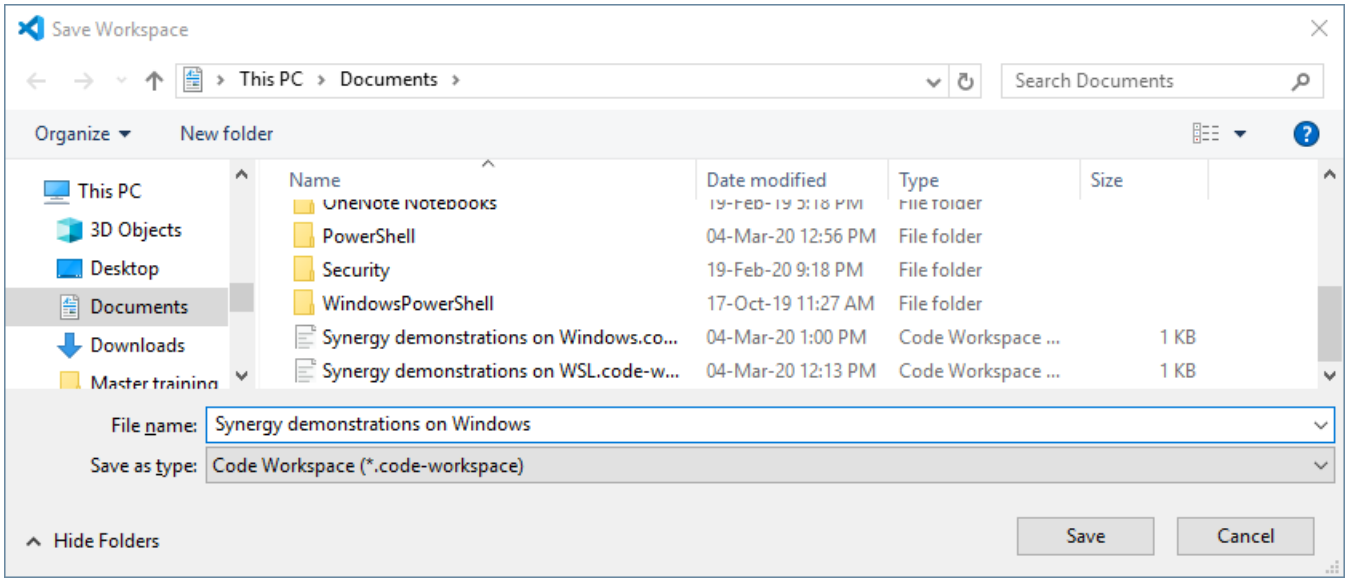


Last step is to save the workspace as our PowerShell workspace project.

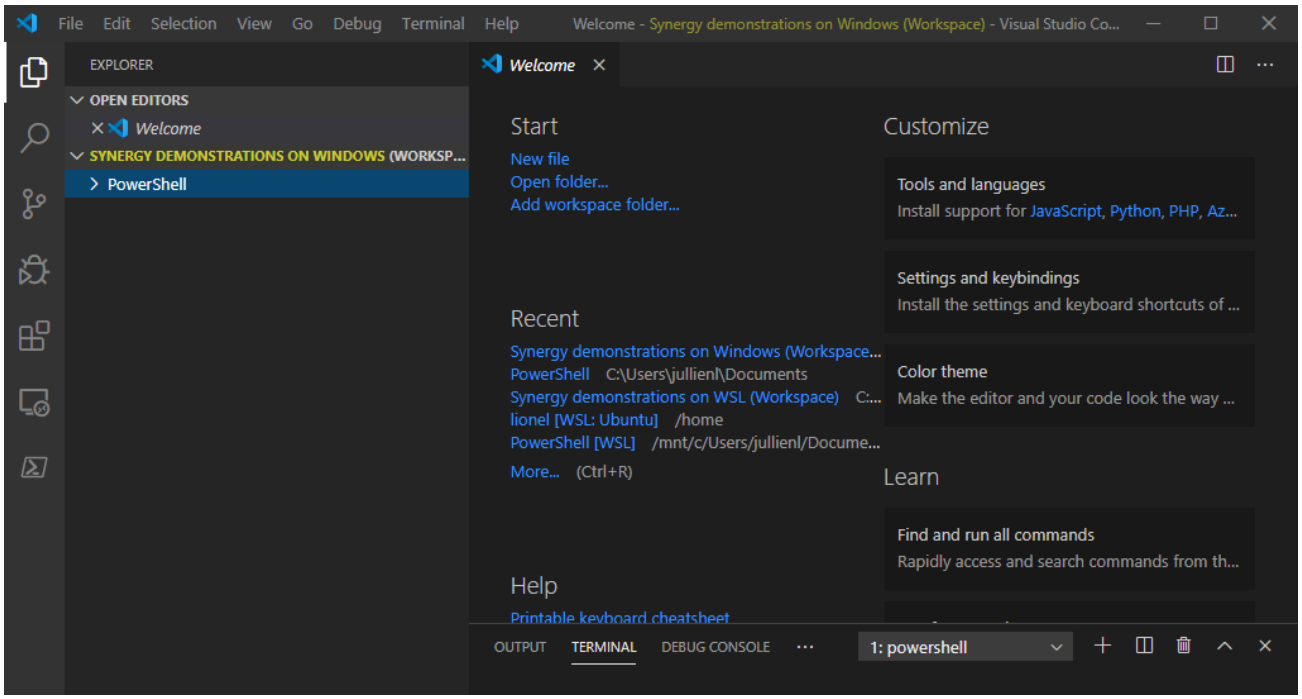
- Select the **File** menu then select **Save Workspace As...**



- Select your Windows User Home directory, enter a project name like **Synergy demonstrations on Windows** then click **Save**



Now like for the WSL workspace, each time you open VS Code, you will find the *Synergy demonstrations on Windows* workspace for the PowerShell activities.

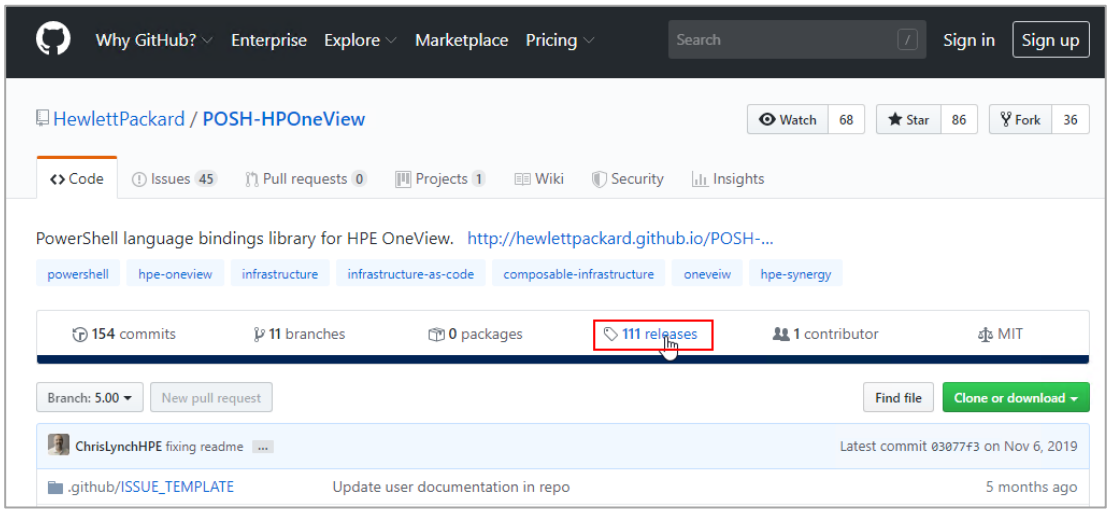


- You can also set the **Format on Save** option in **Preferences** to automatically format your code on save.

Installing the PowerShell library for HPE OneView

The PowerShell library for HPE OneView is available on HPE's GitHub site at https://github.com/HewlettPackard/POSH-HPOneView, it provides many functions to create nice Composable Infrastructure demonstration for customers.

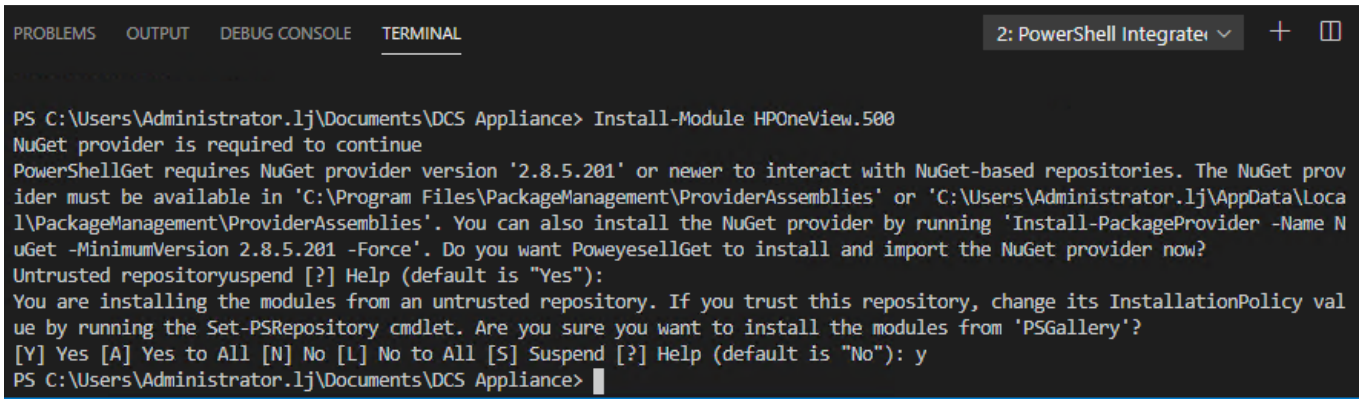
- Open a browser and visit https://github.com/HewlettPackard/POSH-HPOneView
- Select **Releases**



Notice that for 5.x release, we no longer provide any EXE installer so the library can only be installed from the Microsoft PowerShell Gallery.

- Back to Visual Studio Code, enter the following commands in the PowerShell Integrated Console:

```
# Install library from the PowerShell Gallery
Install-Module HPOneView.500
```



- Type **Yes** to Install all required providers and **Yes** to install the library from PSGallery
- You can then Import the module using:

```
Import-Module HPOneView.500
```

- Once the module is successfully imported, you can test the module by entering:

```
get-hpovversion
```

```
PS C:\Users\jullienl\Documents\PowerShell> Get-HPOVVersion

LibraryVersion Path
-------------- ----
5.0.2295.3359  C:\Users\jullienl\Documents\WindowsPowerShell\Modules\hponeview.500\5.0.2295.3359
```

If you get the library version as illustrated above, your module is successfully installed.

Note:
If you get the following error:
`Import-Module: The library is unable to load due to this system missing the required .Net Framework 4.7.2 client.`
You need to install .Net Framework 4.7.2 or later! You can download .Net Framework 4.8 from https://dotnet.microsoft.com/download/dotnet-framework/net48. Once installed, retry the import operation.

Note:
If you get the following error:
`import-module: File <…>.psm1 cannot be loaded because running scripts is disabled on this system`
You need to change your system policy to allow scripting. Enter:

```
Set-ExecutionPolicy -ExecutionPolicy unrestricted
```

or

```
Set-ExecutionPolicy -Scope Process -ExecutionPolicy Bypass -Force -Confirm:$False
```

Note:
If an old version of the module is already installed on your system, use the following commands to update to the latest version:

```
Get-Module HPOneView.500 -ListAvailable | Uninstall-Module
Install-Module -Name HPOneView.500
```

This completes the PowerShell configuration and concludes Chapter-3

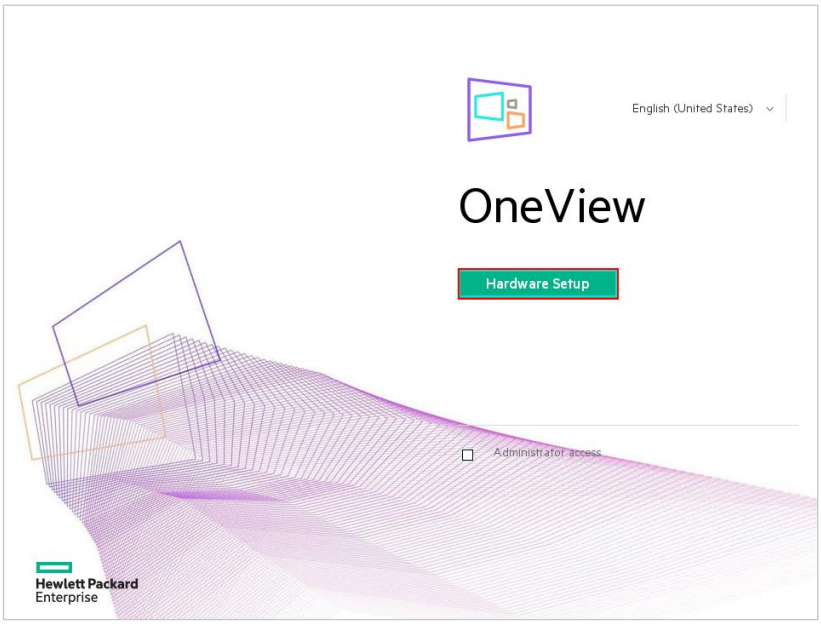
In the next chapter, we will configure HPE OneView.

Chapter-4 –Initial Configuration of the Demonstration Appliance

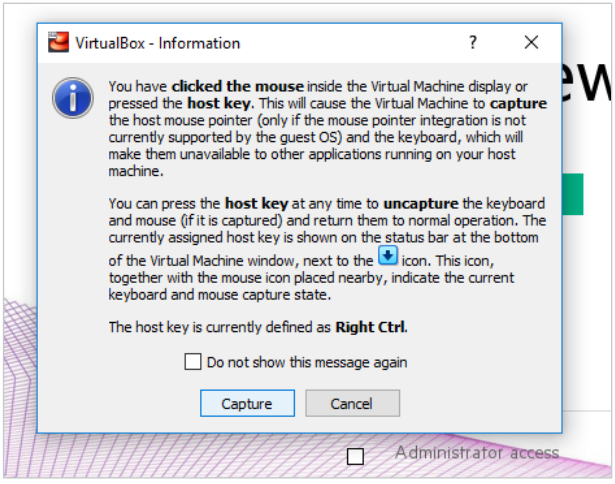
We have completed the installation of our PowerShell/Python scripting languages, prepared the Ansible environment with the required modules and our demonstration appliance must have finished booting up by now, so now we can finalize the configuration of our appliance.

Hardware discovery and initial appliance configuration

- Access to the console and press **Hardware Setup**



Tip: You may get a window popping-up, just check **Do not show this message again** and click **Cancel**

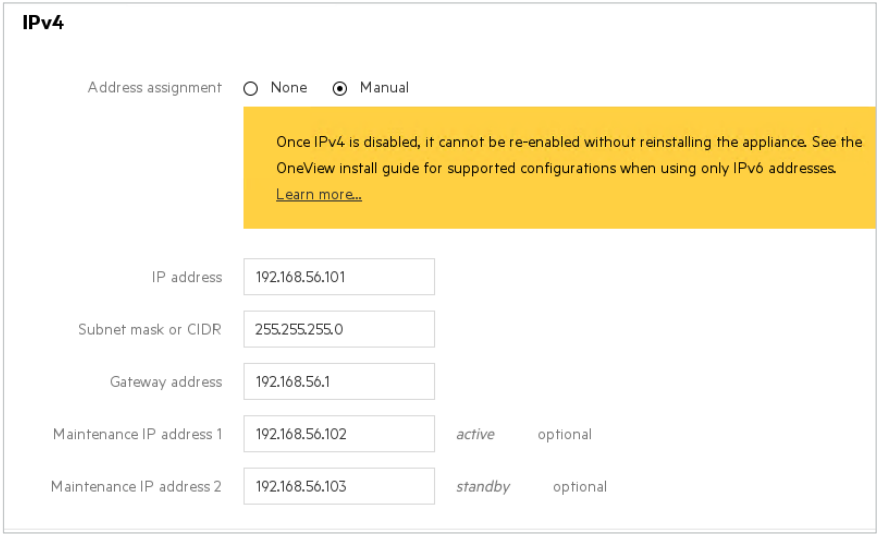


- Change the appliance name with **OneView.net**
- Then we can configure three static IP addresses taken from the "Host-only" VirtualBox subnet (192.168.56.0/24)

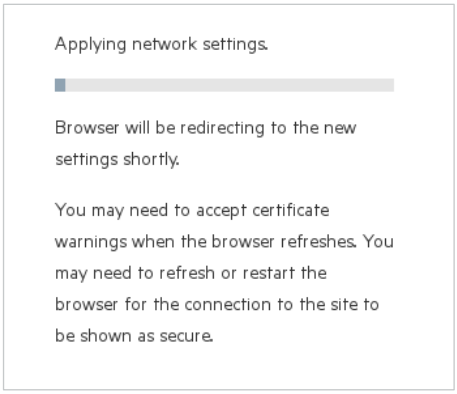
  Note: you can open a Windows command prompt and use `Ipconfig` to see the VirtualBox Host-only network adapter subnet

```
C:\Program Files\Oracle\VirtualBox>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet0:

   Connection-specific DNS Suffix  . : lj.lab
   IPv4 Address. . . . . . . . . . . : 192.168.0.25
   Subnet Mask . . . . . . . . . . . : 255.255.252.0
   Default Gateway . . . . . . . . . : 192.168.1.1

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :
```

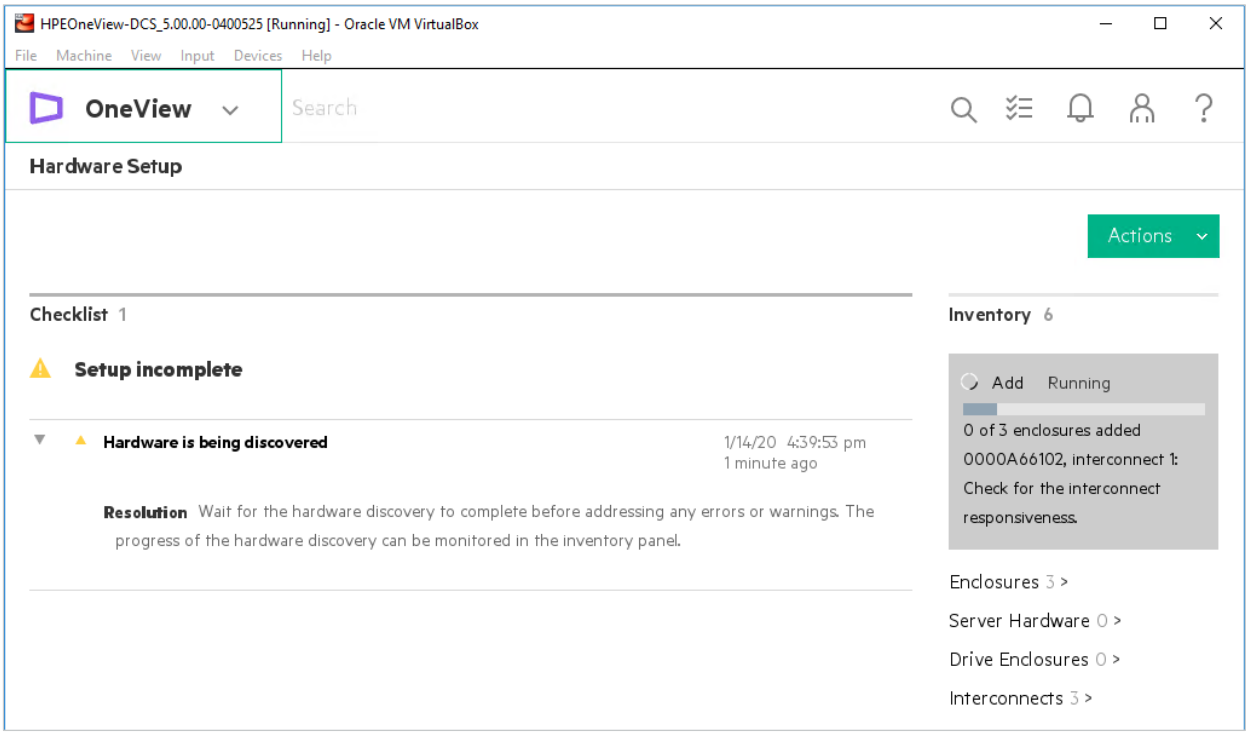
- We can enter the following IP addresses for the default "Host-only" VirtualBox subnet:
  - Primary IP address: **192.168.56.101**
  - Subnet mask: **255.255.255.0**
  - Gateway address: **192.168.56.1**
  - Maintenance IP1: **192.168.56.102**
  - Maintenance IP2: **192.168.56.103**



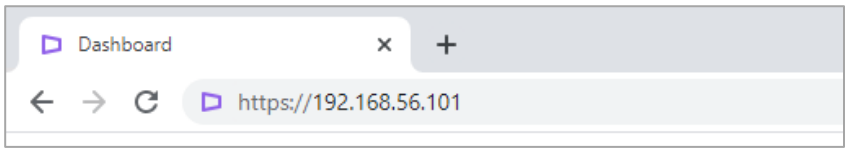
- Then click **OK**



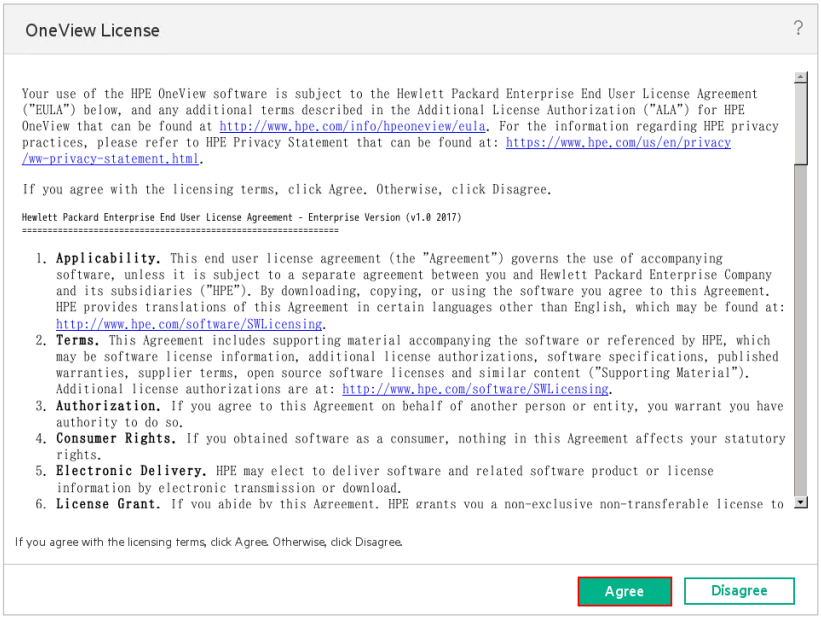
- Once network configuration completes, the initial round of hardware discovery starts:



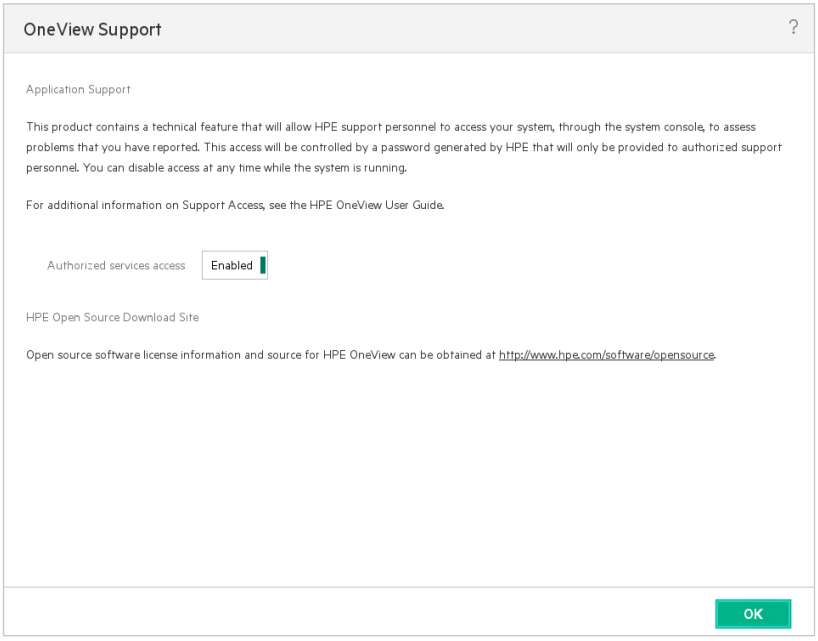
- At this point, you can access your demonstration appliance via a web browser using https://192.168.56.101



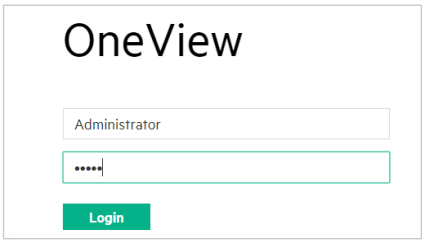
- Accept the OneView license agreement



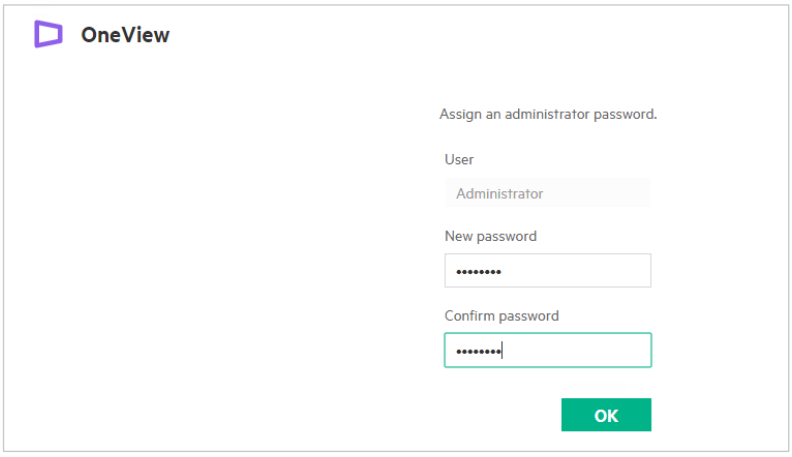
- Leave OneView Support enabled and select **OK**



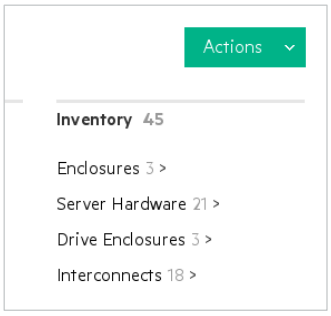
- Log in using **Administrator** / **admin**



- Then change the default password to **password**



- Verify the demonstration appliance is ready to be configured. When the initial hardware discovery is completed you should see:



- 3 Enclosures
- 18 Interconnects
- 21 Servers
- 3 Drive Enclosures

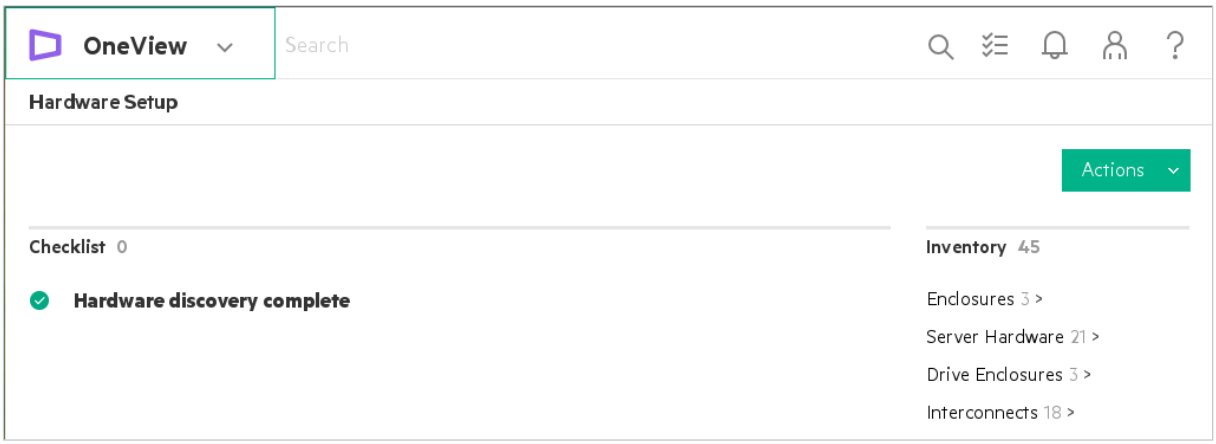
Note: Don't wait for the discovery to complete as it takes about 15-20mn, go to **Chapter-4** and start the installation/configuration of Postman. When the discovery is complete, you can continue Chapter-3.

Creation of an initial setup snapshot

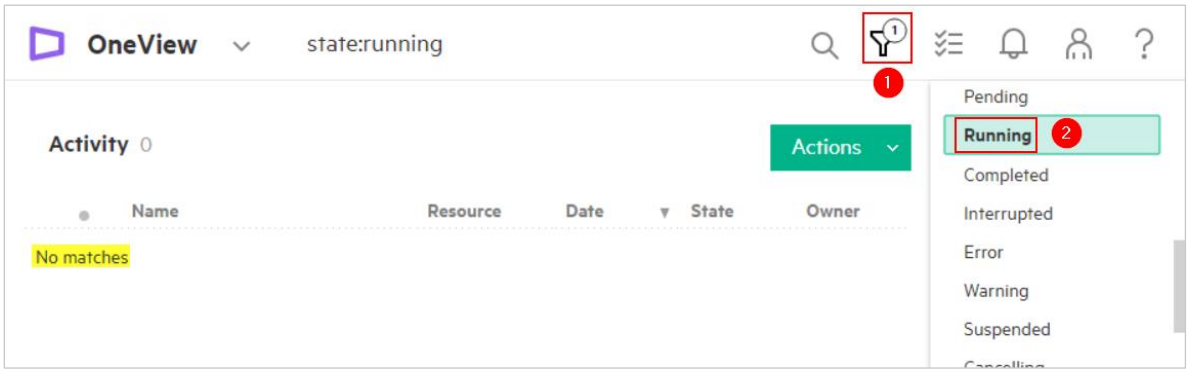
The initial appliance configuration is completed, we can create a snapshot so that we have the initial configuration saved.

Note: Before creating the snapshot:

- Make sure the initial hardware discovery is completed



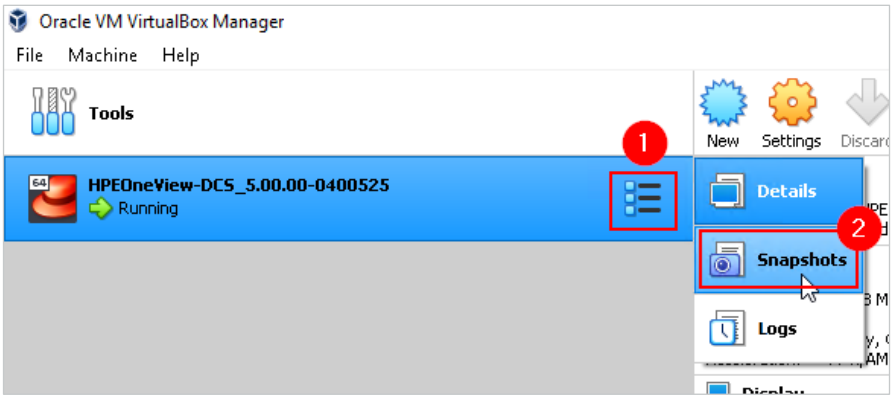
- Try to resolve any issues that may be reported by the appliance
- Make sure there is no OneView tasks that is still running
    - Go in OneView / **Activity** then use **Running** in the Filter tool:



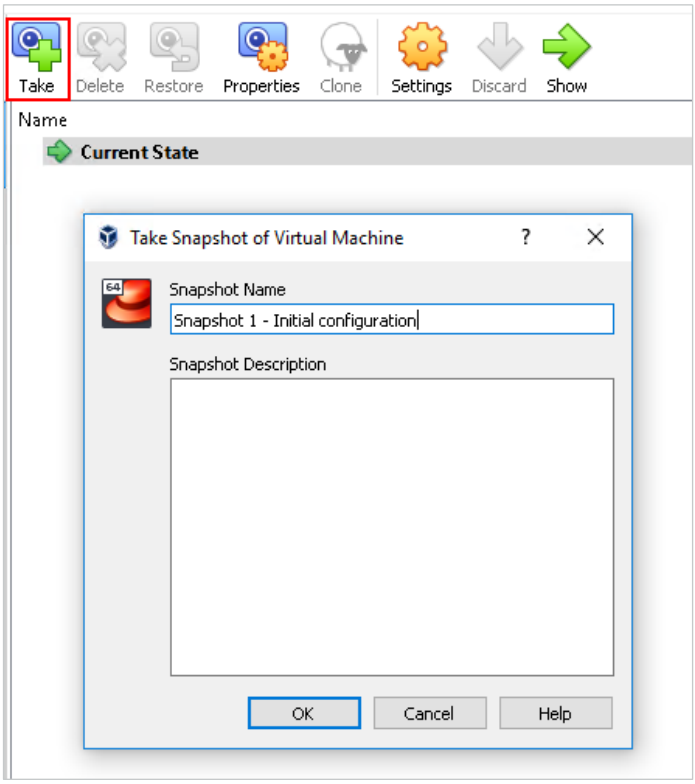
Note: Taking a snapshot while the appliance is running is a key practice to get the appliance up and running almost instantaneously.

To create a snapshot with the initial configuration:

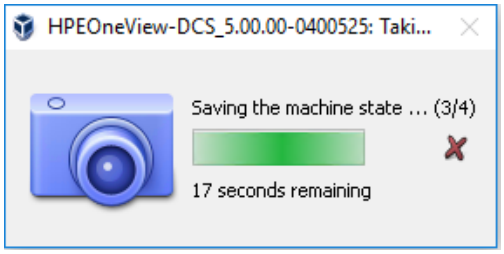
- In VirtualBox, select the **Tools** menu



- Then press on **Take**, enter a snapshot name like **Snapshot 1 – Initial configuration** then click **OK**



- The snapshot creation usually takes about 1 minutes with an SSD drive.



This concludes Chapter-4

In the next chapter, we will install and configure Postman.

Chapter-5 – Preparing Postman

We have installed VS Code, one of the best editor tools to write and run scripts/playbooks against the appliance, however, if you want to place a REST call to the OneView API without writing any code, we need an additional tool.

Placing a REST call to the OneView API without writing any code can be useful when you want to quickly discover a resource, when you want to identify an API attributes, its components and so on.

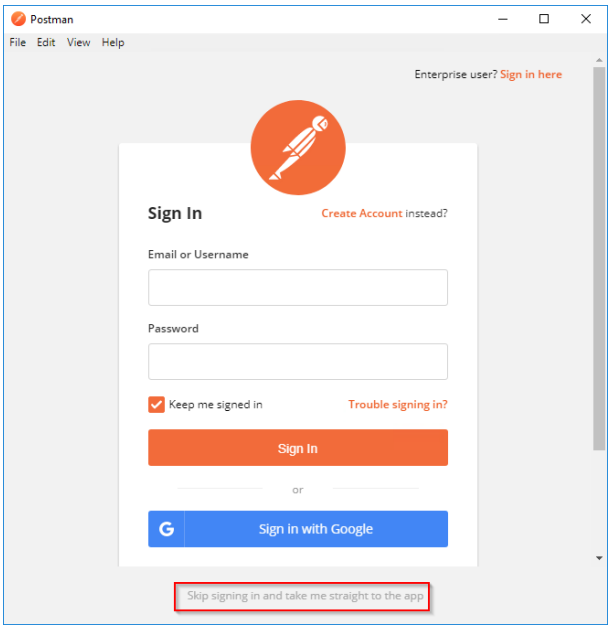
There are several simple solutions for this. My favorite is Postman as it is one of the most complete REST tools and offers useful features:

- You can save your REST calls and share the collections with others
- You can use variables to store for instance the OneView authentication session key

Installing and configuring Postman

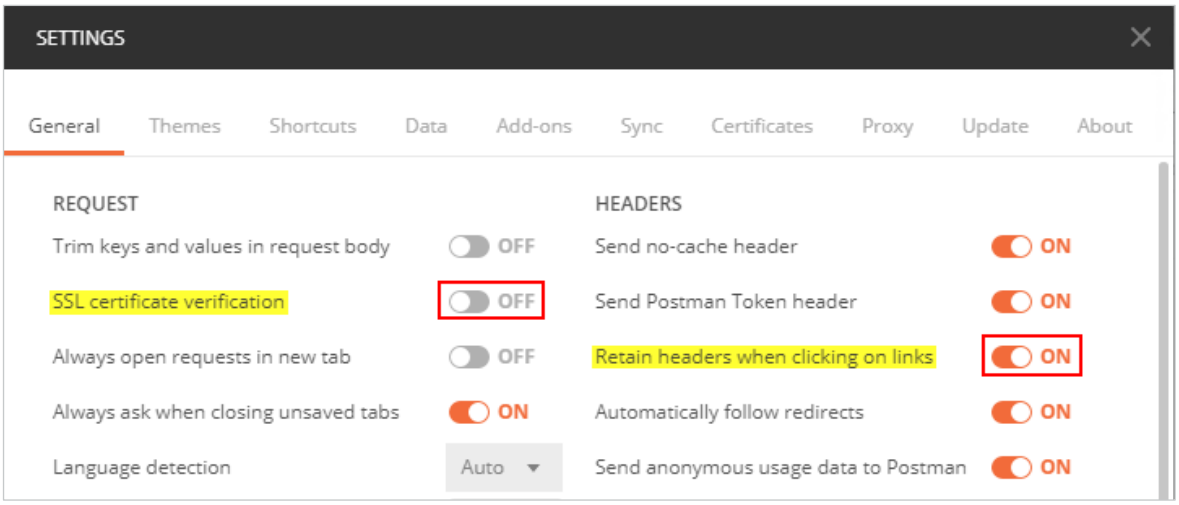
Postman can be downloaded from https://dl.pstmn.io/download/latest/win?arch=64

Once installed and started, you may want to create an account if you want to save your work and share your collections with others. Otherwise, you can skip the account creation by clicking on *Skip signing* at the bottom of the page:



With our OneView demonstration appliance, it is necessary to change two default settings.

- Go to **File / Settings** then set **SSL certificate verification** to **OFF** as HPE OneView uses by default a self-signed certificate:



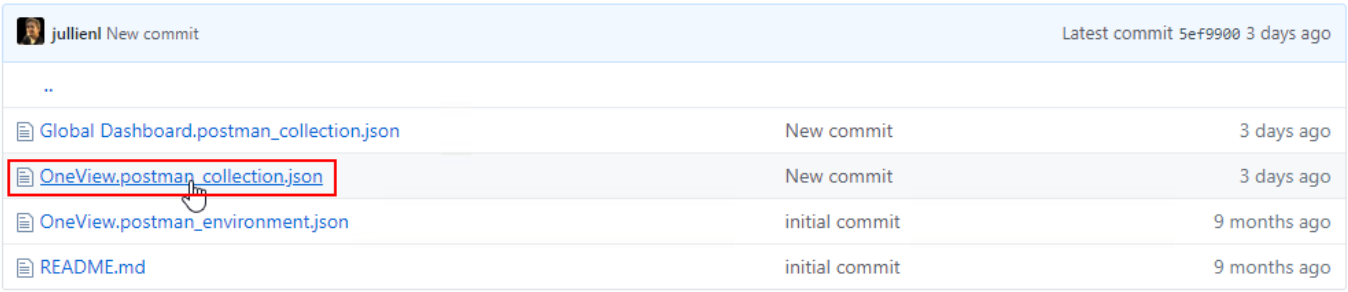
- Set also **Retain headers when clicking on links** to **ON** for greater convenience when clicking on links.

Importing collections

You can import a OneView API Postman Collection from https://github.com/jullienl/HPE-Synergy-OneView-demos/tree/master/OneView-Postman-Collections

This collection brings together several REST calls examples for use with Postman, from the login session to the collection of many different resources using GET requests but also some POST examples to change some settings.

- To import the collection, click on **OneView.postman_collection.json** to open the file content:



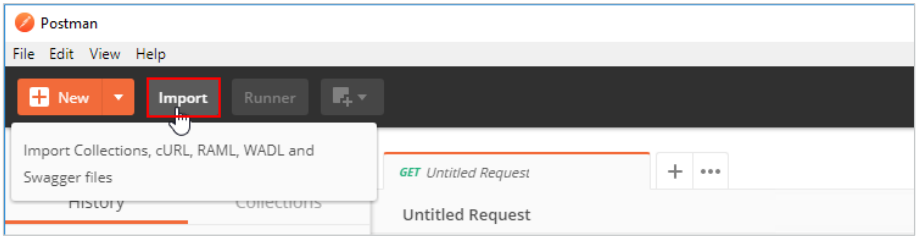
Note: Right-click then **Save link** *as* to save the collection on your system will give you a format not recognized error message when importing in Postman.

- Then click **Raw**

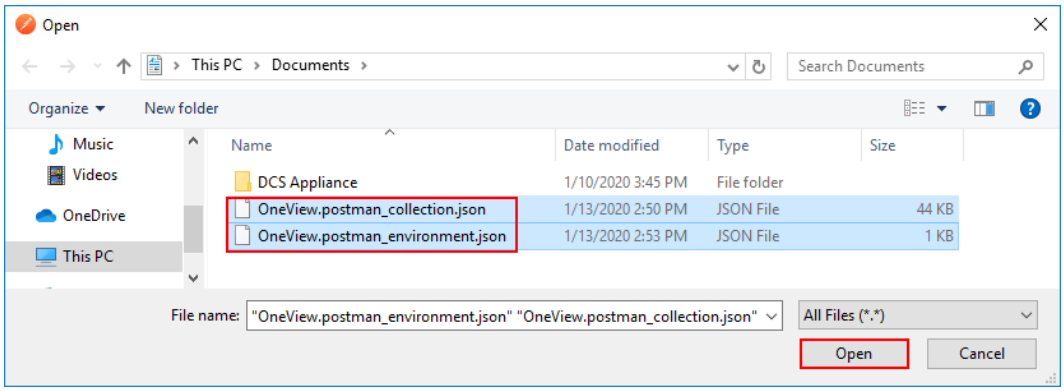
- Then right-click the page and click on **Save as...** to save the JSON file on your system:

- Do the same for **OneView.postman_environment.json**.

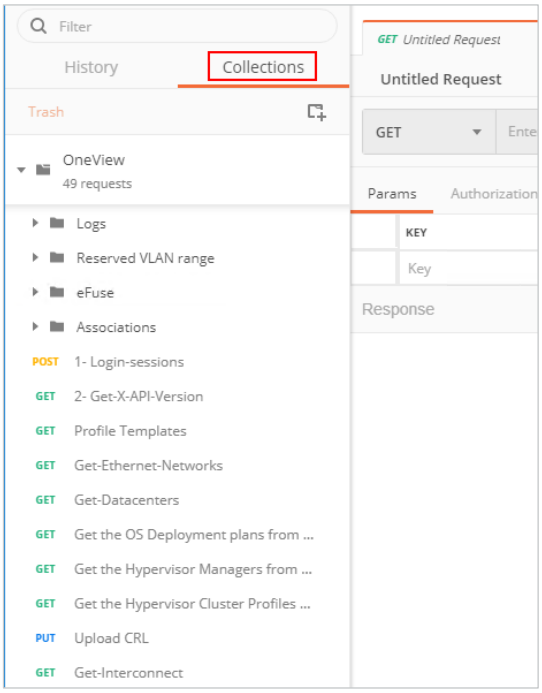
- Back in Postman, click on **Import**:



- Then select the two files and click **Open**



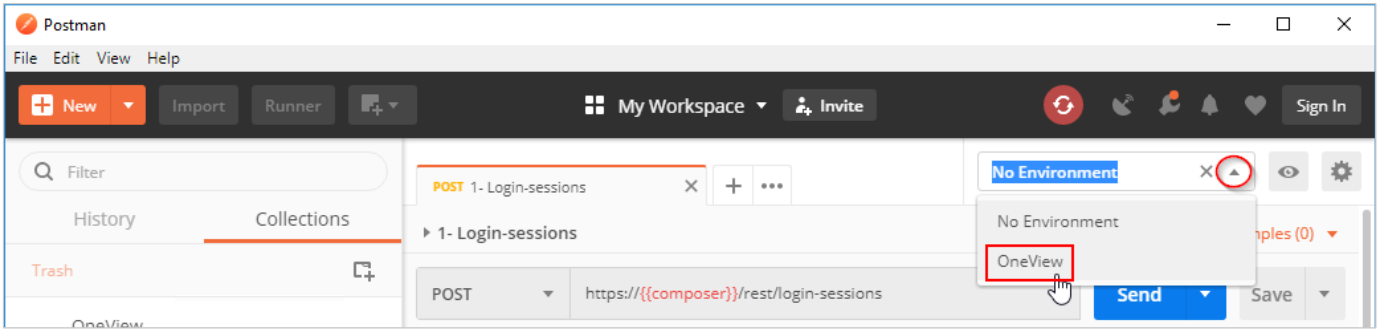
- You should see in collections, the new *OneView* collection



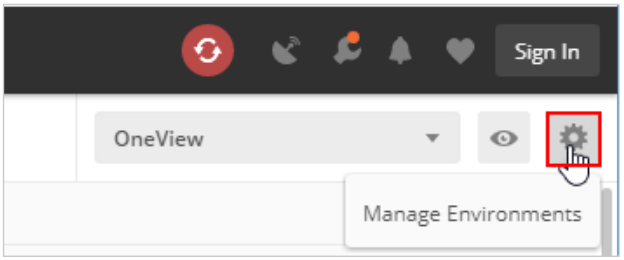
Configuration of the Postman environment

This collection works with a Postman environment (the second file that was imported) which provide a set of variables that allow us to reuse header values in different REST requests. This really simplifies the request creation and the overall use of Postman.

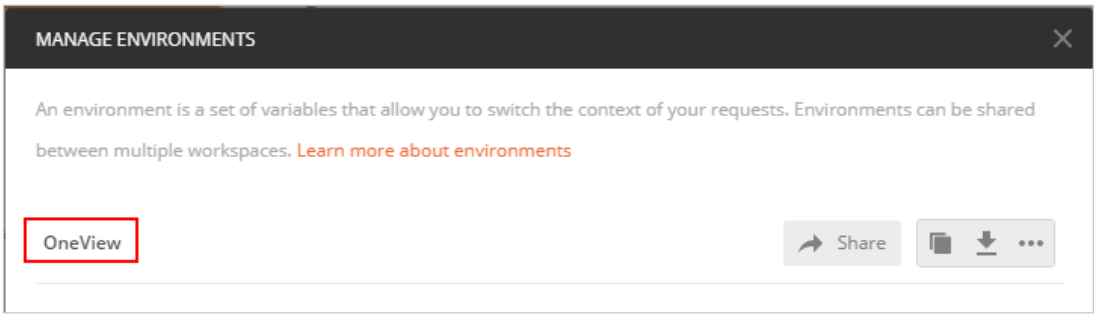
- Expand the environment menu and select **OneView**



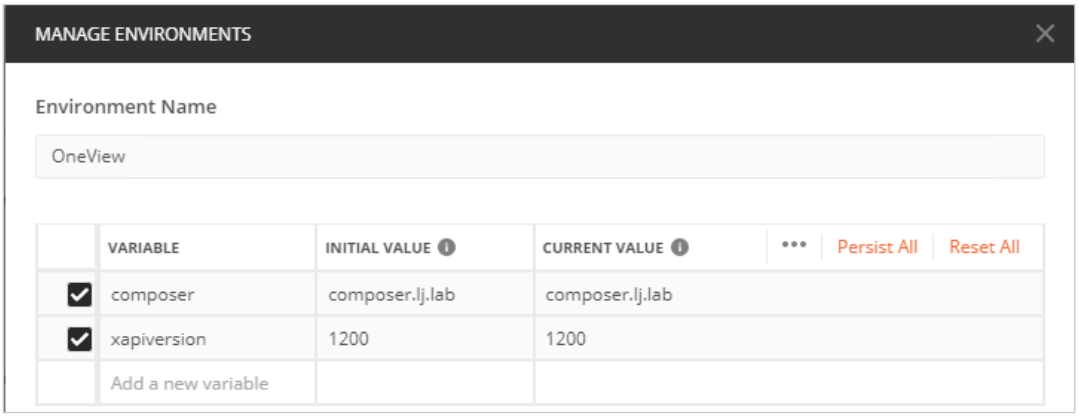
- Then select **Manage Environments**



- Click on **OneView**

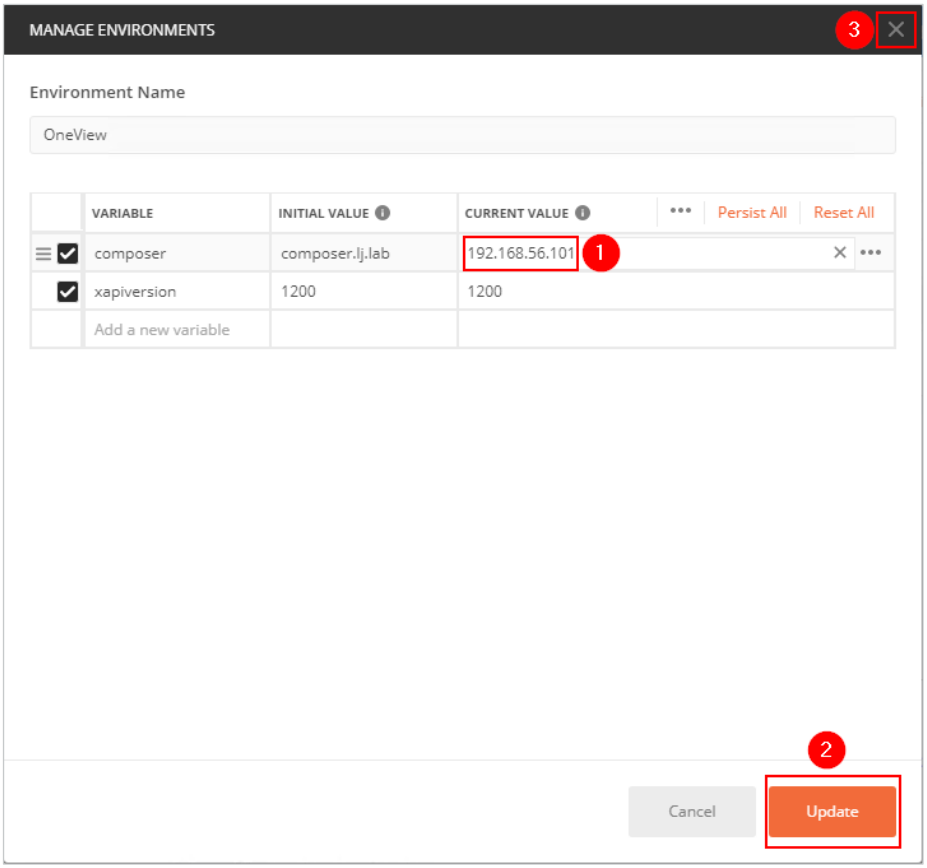


There are two variables defined as illustrated below:

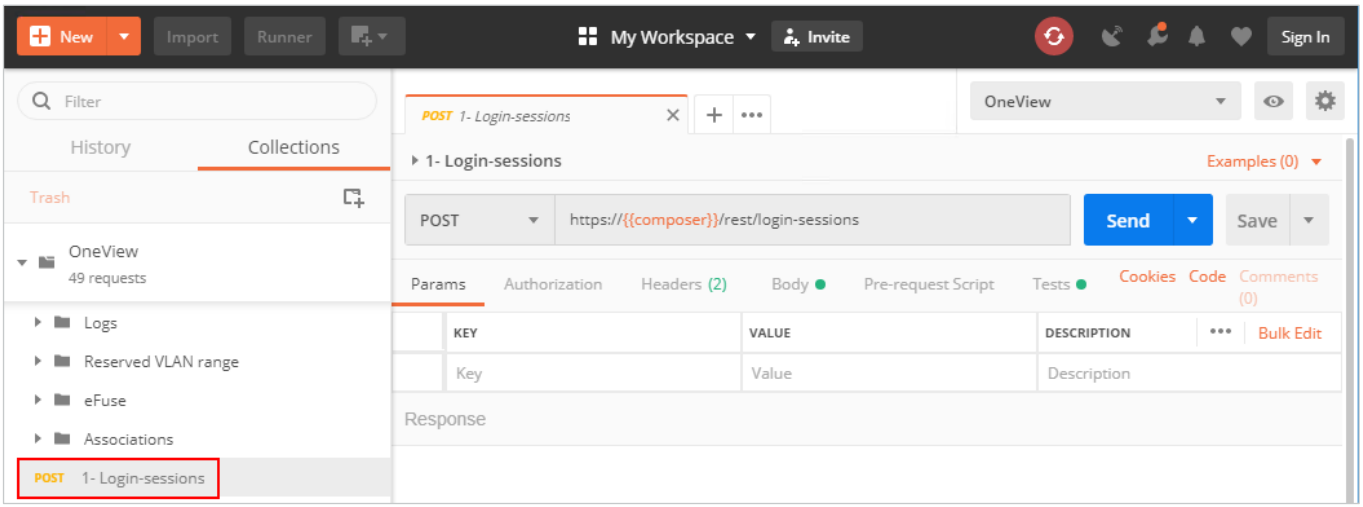


We need to modify the *composer* variable to match with our configuration.

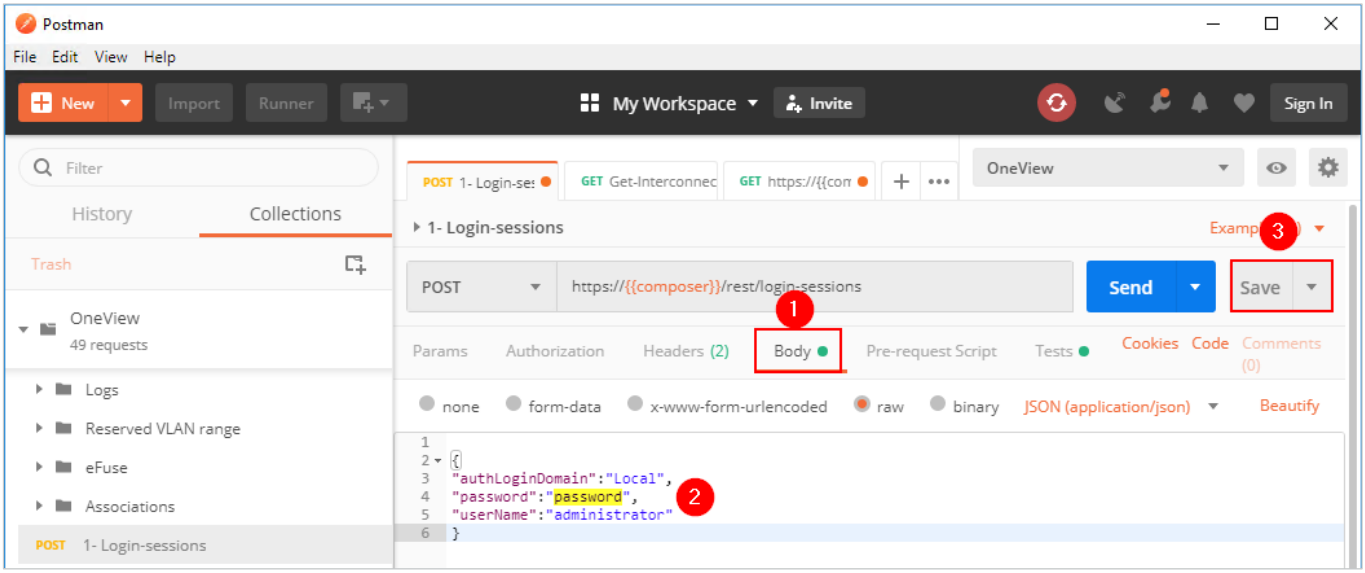
- Change the *composer* value with **192.168.56.101**, the IP address of the appliance then press **Update** then **Close**



- To test a `POST /REST/login-sessions` with the demonstration appliance, select **1-Login-sessions**

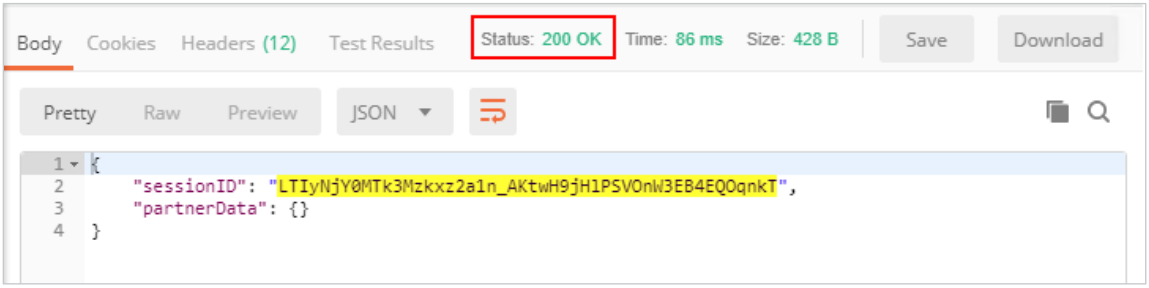


- Then we need to modify the password used by Administrator, select **Body** then enter the password you set in the previous section then click **Save**



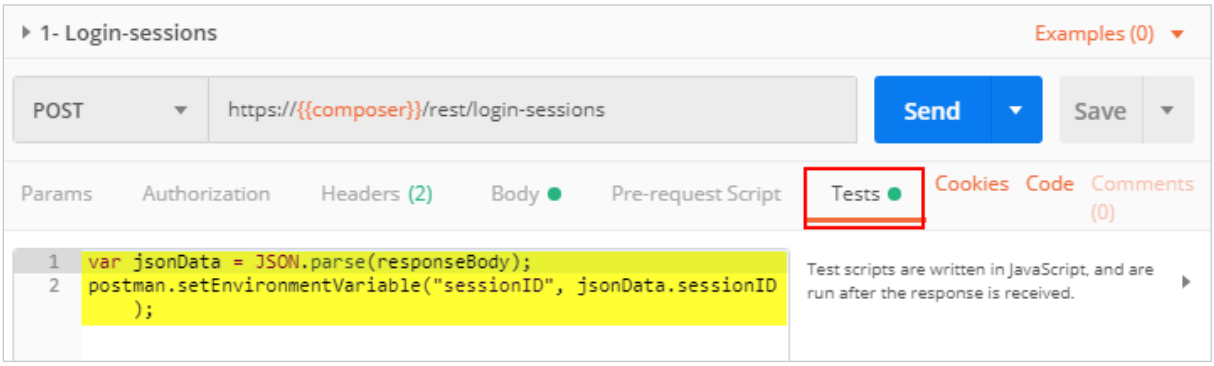
- Then press **Send**

The response we should get is the following:

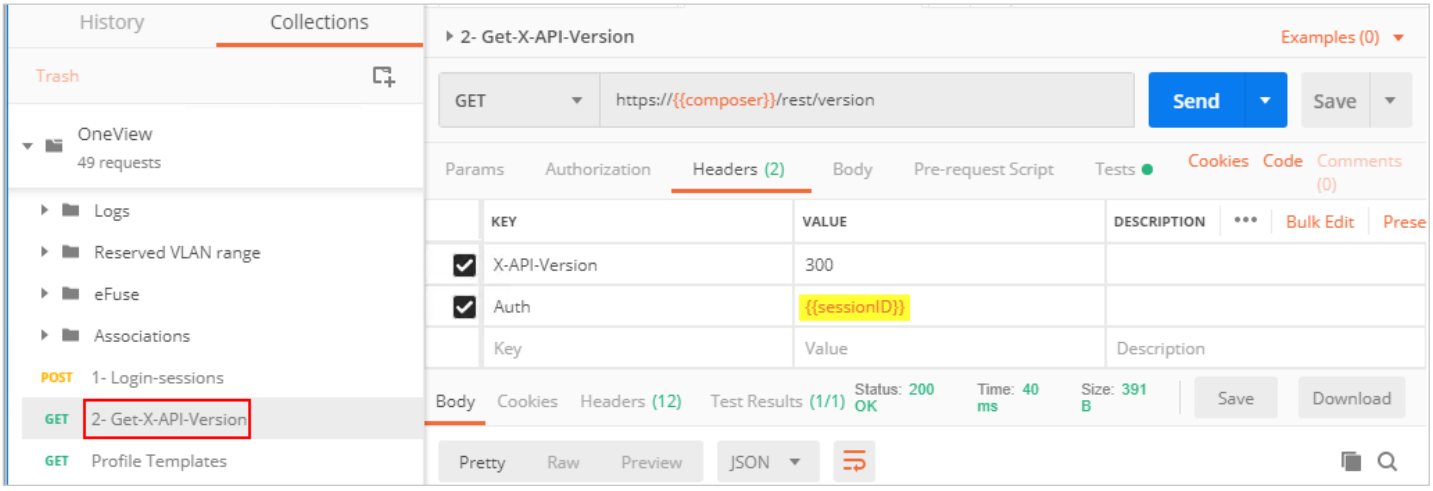


In the Response section, as illustrated above, you want to check the HTTP status code. A value of `200` means it was successful. In the body section, you should get a session ID for the authentication.

All other REST requests available in this OneView collection should work successfully as we are passing, using a variable, this session ID to all requests. The creation of this variable `sessionID` is done in the **Tests** menu of the Login-sessions request:



The variable `sessionID` is then set using `{{…}}` in the header of each request:



This concludes Chapter-5

In the next chapter, we will prepare a demo scenario.

Chapter-6 - Preparing your demonstration appliance for demos

HPE Synergy is a new class of system that falls under a category known as a composable infrastructure. This category is emerging as the datacenter infrastructure that seeks to reconstruct previously dedicated compute, storage and network fabric resources into shared, flexible resource pools that are available for on-demand allocation.

This on-demand availability and flexibility of all resources, identified as the core of the new composable infrastructure can be effectively demonstrated using scripting languages such as PowerShell, Python and others.

In this chapter, we are going to prepare the appliance to be ready for customer facing demonstrations.

If we need a fast method to run any type of demonstration, we must use snapshot technology and prepare at least 2 snapshots for different type of scenarios/use cases:

1- First snapshot: OneView appliance first time setup is done (IP addresses set, discovery of all enclosures and servers is done) but the Synergy frames are not configured (no LE, no LIG, no EG, no network)

   ⇨ Can be used to show how to automate the setup of Synergy and the power of our infrastructure as code implementation.

2- Second snapshot: same as first snapshot but here Synergy frames are fully configured with LE, EG, LIG and some networks.

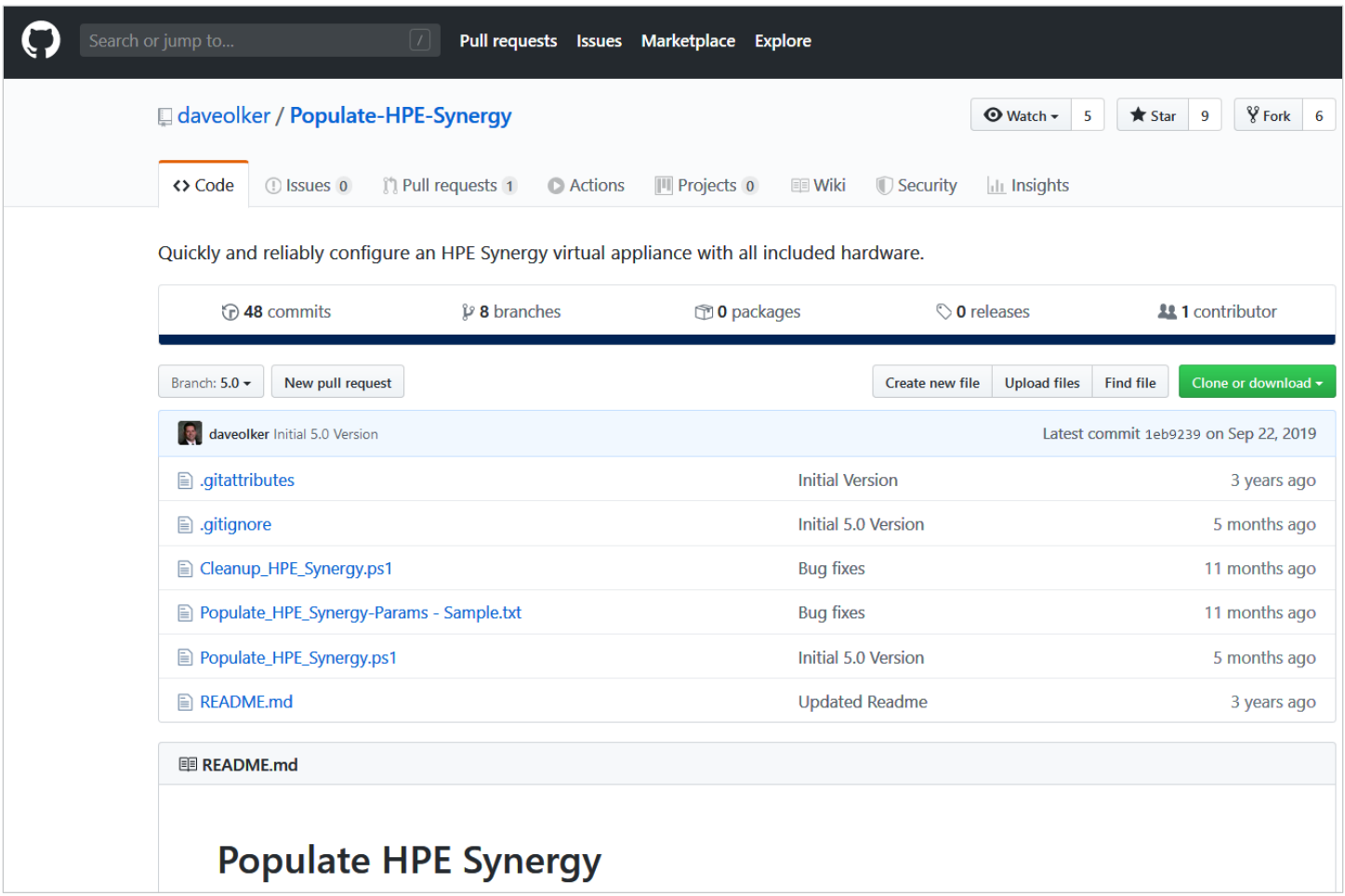
   ⇨ Can be used to run demos with an already configured environment to demonstrate features of the Composable infrastructure like creating server profiles, adding networks, modifying VC configuration, etc.

Final appliance configuration

To setup the HPE Synergy Composer appliance with all included hardware, we are going to use a PowerShell script.

Note: This script can also be used to show how we can fully configure a OneView/Synergy environment in front of a customer.

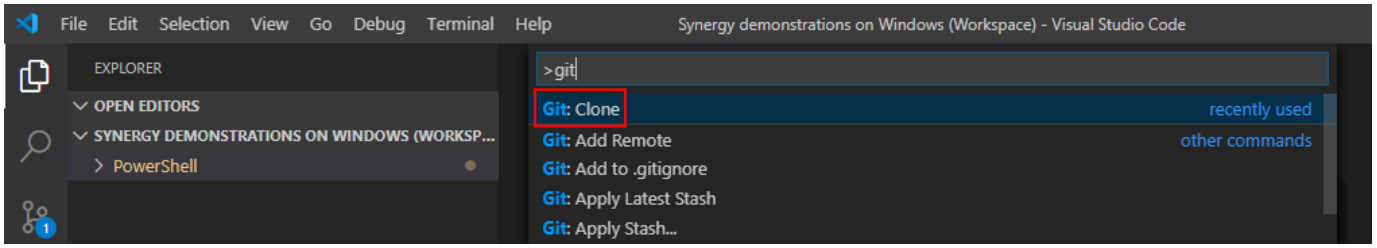
Dave Olker from HPE maintains a GitHub repository (https://github.com/daveolker/Populate-HPE-Synergy-DCS) with a powerful script to configure and populate entirely the HPE OneView DCS demonstration appliance.



To clone the Dave's repo in our VS Code workspace, we are going to use Git. One benefit of using git is that every time new scripts are pushed or changed in this repository, the VS Code Git source control will raise an alert.

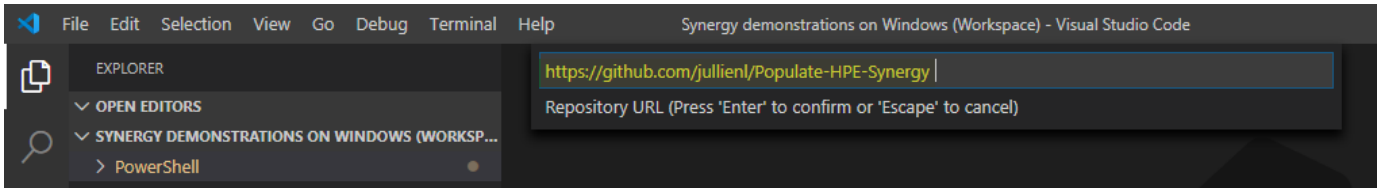
To clone the Dave's repo:

- Open **Synergy demonstrations on Windows** workspace in VS Code.
- Open the Command Palette (**Ctrl**+**Shift**+**P**) and enter **Git** and select the **Git: Clone** command:

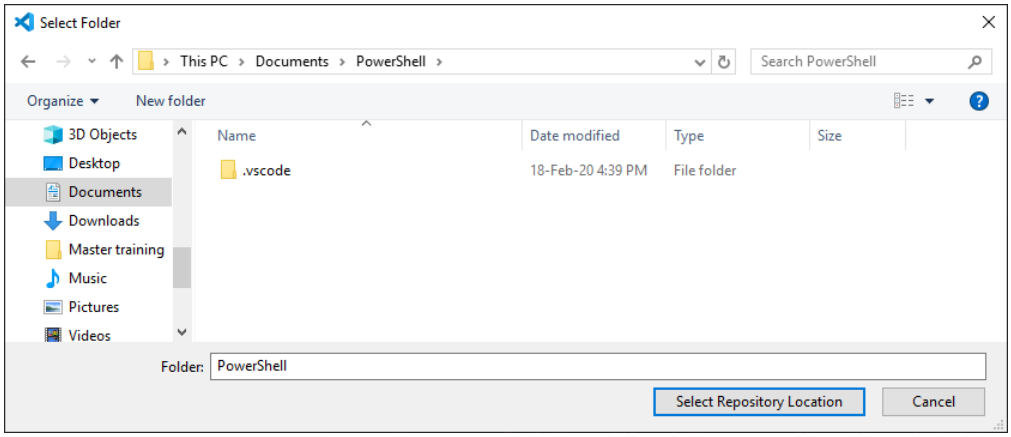


- Enter the following link: **https://github.com/jullienl/Populate-HPE-Synergy**

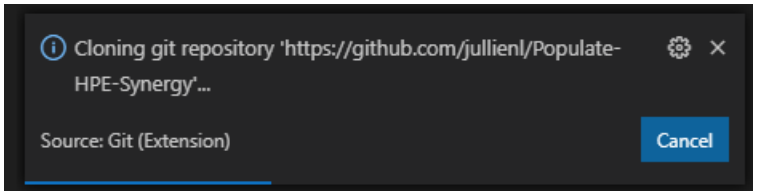
  Note: This repository is forked from daveolker/Populate-HPE-Synergy. This fork provides a few changes from Dave' repository to meet the needs of our demonstration scenarios.



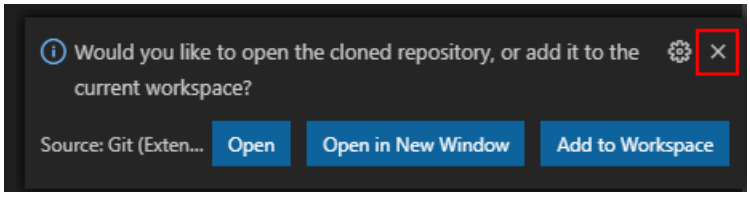
- Then select your Windows user home workspace folder as the parent directory under which to put the Dave's forked repository:



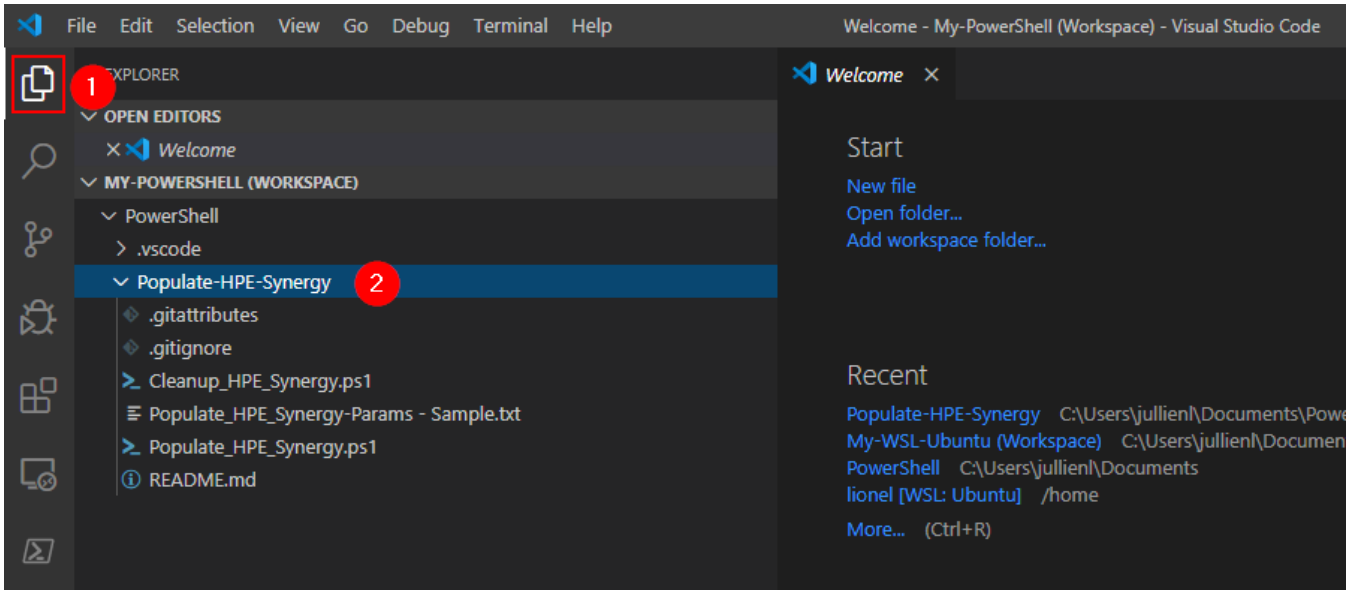
- Once selected, the cloning starts:



- Just close the pop-up window for now



- You can see now a new folder named **Populate-HPE-Synergy** in your user home directory:

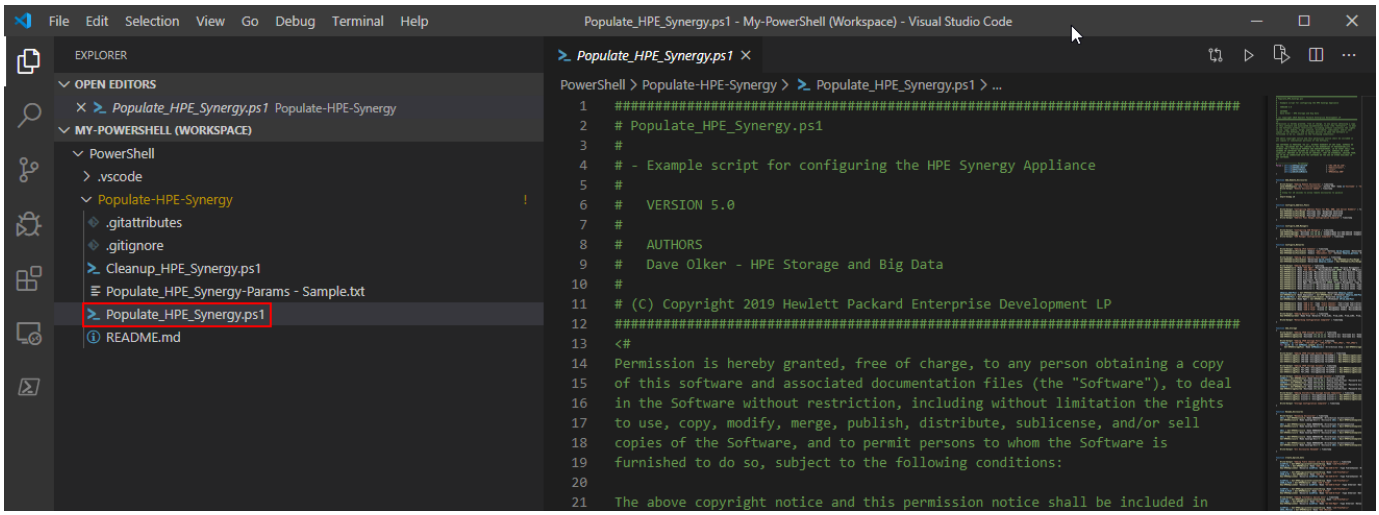


This repository provides two scripts, one to configure and populate entirely the HPE OneView DCS demonstration appliance and one to clean up everything:

`Populate_HPE_Synergy.ps1` script connects with the appliance and discovers/configures all the simulated hardware.

When the script is run, it prompts for the hostname or IP address of the Synergy appliance, the Administrator username (usually Administrator), and the Administrator password.

- Open **Populate_HPE_Synergy.ps1**



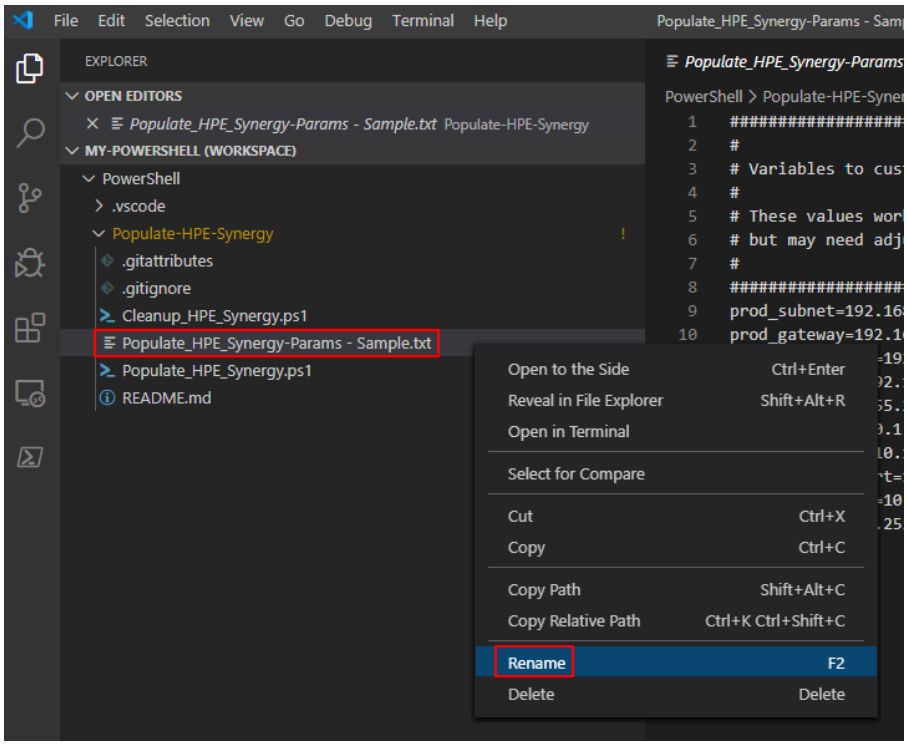
As described in the README.md, this script does the following:

- Prompts the user for the location of a Service Pack for ProLiant to upload as a Firmware Bundle
- Prompts the user for a text file containing OneView and Synergy 8GB Fibre Channel Licenses
- Configures two additional Synergy Enclosures
- Renames all five Synergy Enclosures
- Powers off all Compute Modules
- Configures the simulated Cisco SAN Managers
- Configures multiple Ethernet, Fibre Channel, and FCoE Networks
- Configures multiple 3PAR Storage Arrays, Volume Templates, and Volumes
- Adds various Users with different permissions
- Deploys an HPE Image Streamer OS Deployment instance
- Creates Logical Interconnect Groups
- Creates multiple Uplink Sets
- Creates an Enclosure Group
- Creates a Logical Enclosure
- Creates multiple sample Server Profile Templates
- Creates multiple sample Server Profiles
- Adds various Scopes
- Configures remote resources including: LE, LI, LIGs, Enclosure Group

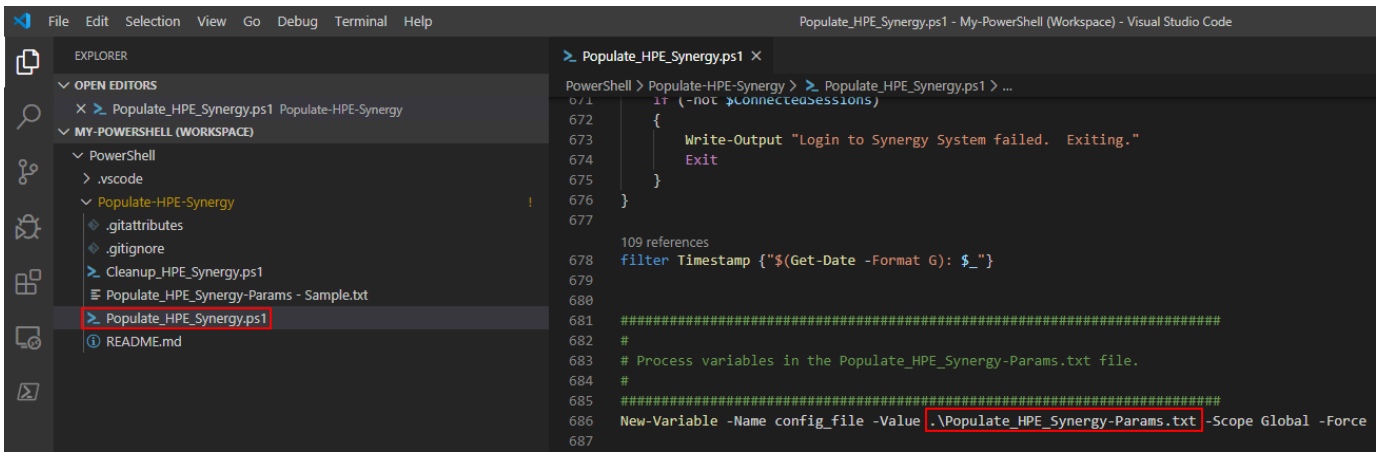
Note: To get a better display of the script, press **CTRL** + **K** + **CTRL** + **0** to collapse all regions

The next step is to set the `Populate_HPE_Synergy-Params - Sample.txt` used by this script to define some important variables. Good news, this configuration file is designed to work out-of-the-box with our VirtualBox using a host-only networking configuration so only one change is needed:

- Rename the file `Populate_HPE_Synergy-Params - Sample.txt` to **Populate_HPE_Synergy-Params.txt**



This configuration file is defined line 686 in the script:



- Scroll-down to line 700 in the script. This is where all functions defined at the beginning of the script are called:

```
698
699   Write-Output "Configuring HPE Synergy Appliance" | Timestamp
700
701   Add_Firmware_Bundle
702   Add_Licenses
703   Configure_Address_Pools
704   Add_Remote_Enclosures
705   Rename_Enclosures
706   PowerOff_All_Servers
707   Configure_SAN_Managers
708   Configure_Networks
709   Add_Storage
710   Add_Users
711   Create_OS_Deployment_Server
712   Create_Logical_Interconnect_Groups
713   Create_Uplink_Sets
714   Create_Enclosure_Group
715   Create_Logical_Enclosure
716   Add_Scopes
717   Create_Server_Profile_Template_SY480_Gen9_RHEL_Local_Boot
718   Create_Server_Profile_Template_SY660_Gen9_Windows_SAN_Storage
719   Create_Server_Profile_Template_SY480_Gen9_ESX_SAN_Boot
720   Create_Server_Profile_Template_SY480_Gen10_ESX_SAN_Boot
721   Create_Server_Profile_SY480_Gen9_RHEL_Local_Boot
722   Create_Server_Profile_SY660_Gen9_Windows_SAN_Storage
723   Create_Server_Profile_SY480_Gen9_ESX_SAN_Boot
724   Create_Server_Profile_SY480_Gen10_ESX_SAN_Boot
725
```

Each function runs a specific task:

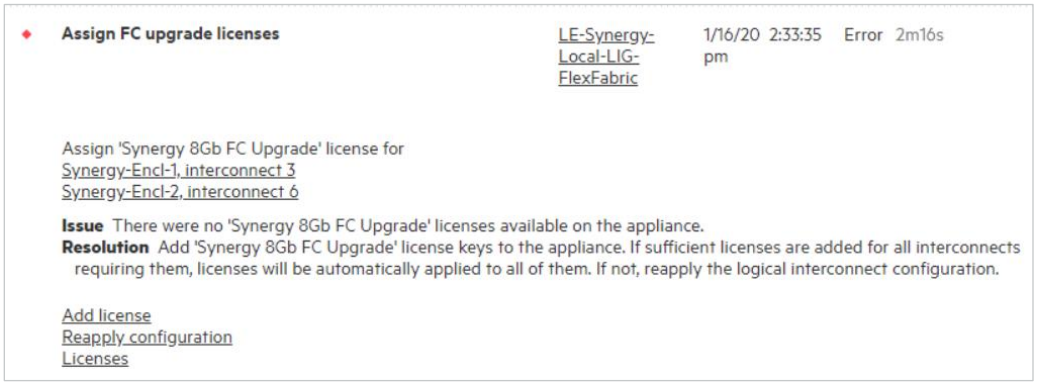
- `Add_Firmware_Bundle` adds a Service Pack for ProLiant ISO file to the OneView repository. This is optional but needed if you want to demonstrate firmware upgrade capabilities of HPE OneView but keep in mind that the firmware upgrade demonstration will be limited as you cannot update firmware of simulated hardware/server profiles.

Note: You can download an HPE Synergy SPP from https://www.hpe.com/downloads/synergy

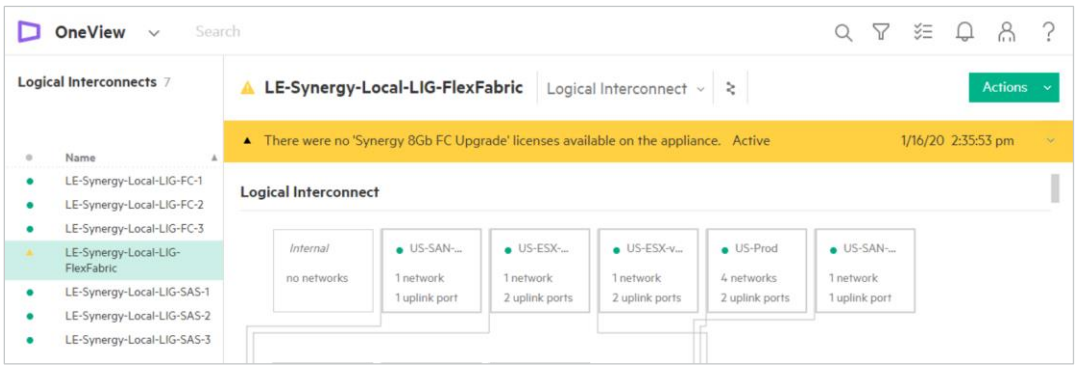
Note: You can always upload it later to your OneView appliance by going to Firmware Bundles in the Appliance section of the main menu

When run, the function asks to specify the location of a Service Pack for ProLiant ISO file.

- `Add_Licenses` adds a Synergy Fibre Channel license to OneView. When run, the function asks to specify the filename containing the license. OneView licenses is not required for a Synergy environment. For Fibre Channel connectivity with the Virtual Connect SE 40 Gb F8 Module, a license is required. Without this license, FC ports cannot be activated but this is not blocking any operations other than:
    - Throwing an error during the creation of the Logical Enclosure:

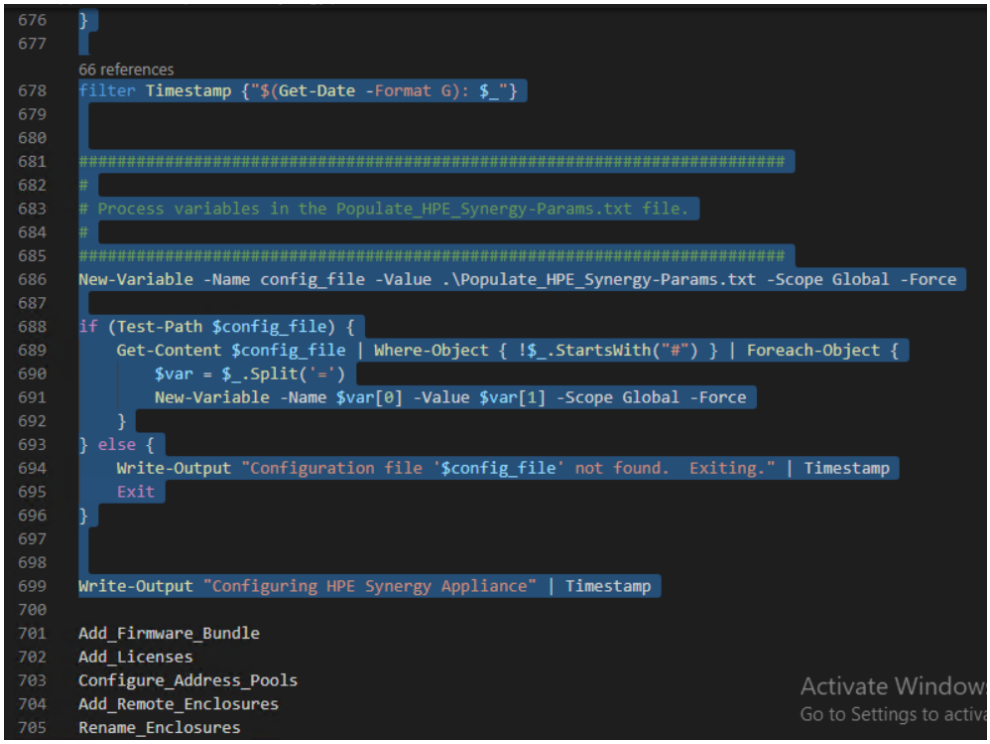


    - Displaying a warning message that there is no license for the VC Logical Interconnect:

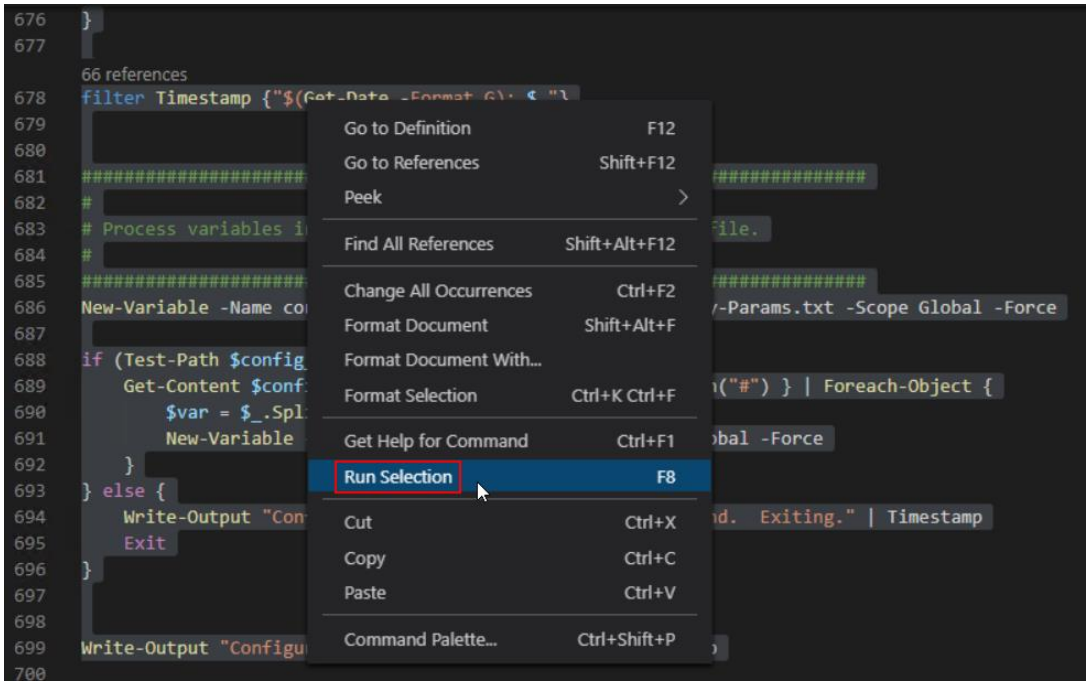


- `Configure_Address_Pools` configures the virtual address pools for MAC, WWN, and Serial Numbers.
- `Add_Remote_Enclosure` adds two additional enclosures in OneView (optional).
- `Rename_Enclosures` renames the 5 enclosures with more convenient names (e.g. Synergy-Encl-1, Synergy-Encl-2, etc.)
- `PowerOff_All_Servers` turns all servers off to prepare the creation of Server Profiles
- `Configure_SAN_Managers` adds two Cisco MDS 9250i switches
- `Configure_Networks` creates 15 networks (Ethernet, FC and FCoE)
- `Add_Storage` adds 2 x 3PAR 7200 Storage Systems and 3 x StoreVirtual then adds 3 x Volumes and 7 x Volume Templates
- `Add_Users` creates 5 new users with different roles.
- `Create_OS_Deployment_Server` configures the enclosures for Image Streamer
- `Create_Logical_Interconnect_Groups` creates 3 x LIGs (SAS, FC and FlexFabric)
- `Create_Uplink_Sets` configures 8 x uplink sets (2xFC, 2xFCoE, 1xMgmt, 1x vMotion, 1xImageStreamer, 1xProd)
- `Create_Enclosure_Group` creates an EG with 3 frames/LIGs + Image Streamer
- `Create_Logical_Enclosure` creates the LE with EG/LIGs/Streamer configured previously
- `Add_Scopes` creates a new scope with the first frame and the production networks
- `Create_Server_Profile_xxx` creates different server profiles types using Gen9 and Gen10 servers

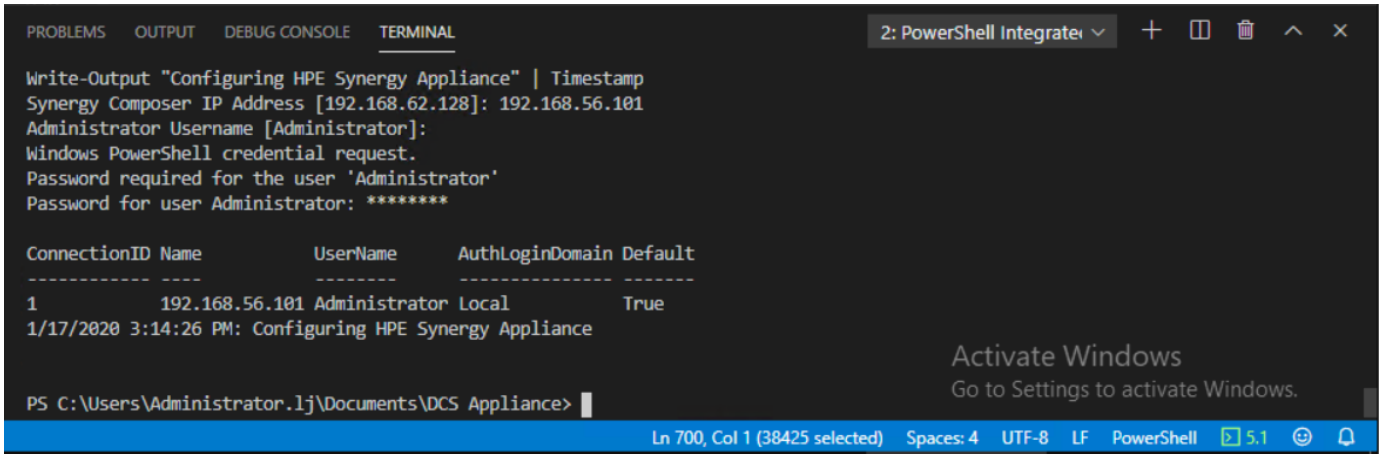
- Now select the first part of the script from line 1 to 699



- Once selected, press **F8** (or right-click **Run Selection**) to execute only the selected lines:

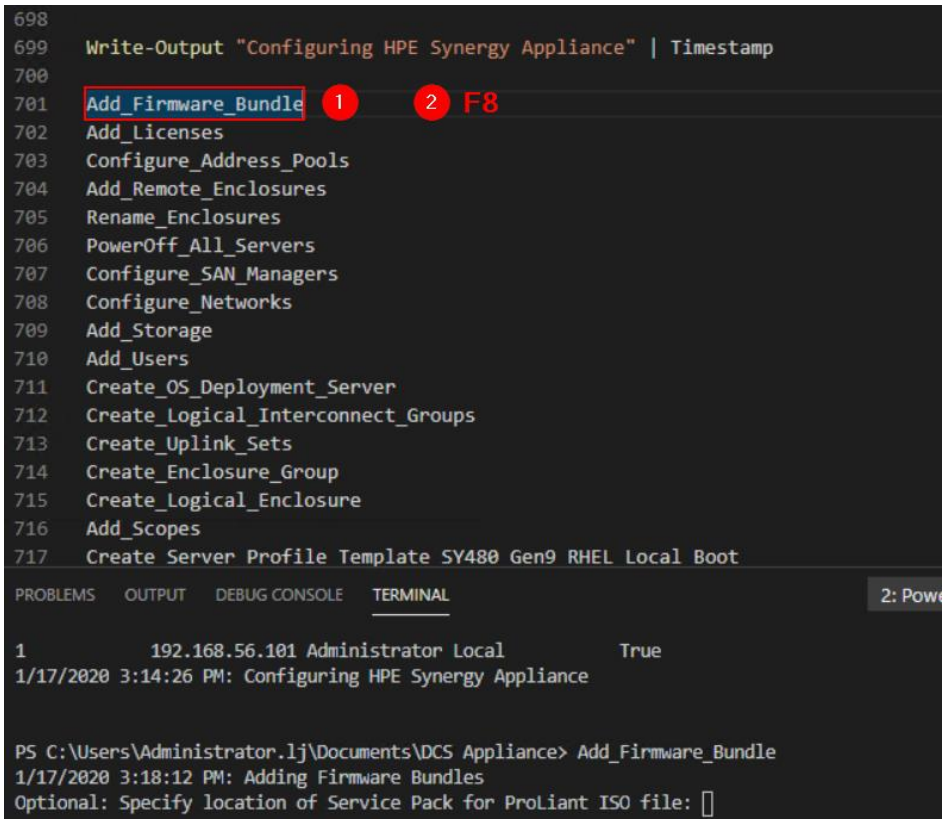


- As requested, enter the Composer IP: **192.168.56.101**
- Then **Administrator** / **password** for the OneView credentials



- Make sure no error is thrown.

- Then the idea is to select and run one at a time each function by pressing **F8** so that we see the output in the console. You can move back and forth between VS Code and OneView web interface to see the result of each step.



Note: Only the first two steps require some input. They are optional.

- For `Add_Firmware_Bundle`, the SPP ISO file is optional, you can press **ENTER**
- For `Add_License`, the licenses are optional, you can press **ENTER**

Note: `Add_Remote_Enclosures` takes some time but is optional so for the sake of time, we will skip it!

- Stop after the creation of the second server profile Template line 718. The other profile creations and setup of remote enclosures will be kept for customer demonstration.

```
713   Create_Uplink_Sets
714   Create_Enclosure_Group
715   Create_Logical_Enclosure
716   Add_Scopes
717   Create_Server_Profile_Template_SY480_Gen9_RHEL_Local_Boot
718   Create_Server_Profile_Template_SY660_Gen9_Windows_SAN_Storage
719   Create_Server_Profile_Template_SY480_Gen9_ESX_SAN_Boot
720   Create_Server_Profile_Template_SY480_Gen10_ESX_SAN_Boot
721   Create_Server_Profile_SY480_Gen9_RHEL_Local_Boot
722   Create_Server_Profile_SY660_Gen9_Windows_SAN_Storage
723   Create_Server_Profile_SY480_Gen9_ESX_SAN_Boot
724   Create_Server_Profile_SY480_Gen10_ESX_SAN_Boot
725
726   #
727   # Add Second Enclosure Group for Remote Enclosures
728   #
729   Create_Logical_Interconnect_Groups_Remote
730   Create_Enclosure_Group_Remote
731   Create_Logical_Enclosure_Remote
732
733   Write-Output "HPE Synergy Appliance Configuration Complete" | Timestamp
```

- For the last step, enter the following command in the console to disconnect VS Code from the appliance:

```
Disconnect-HPOVMgmt
```

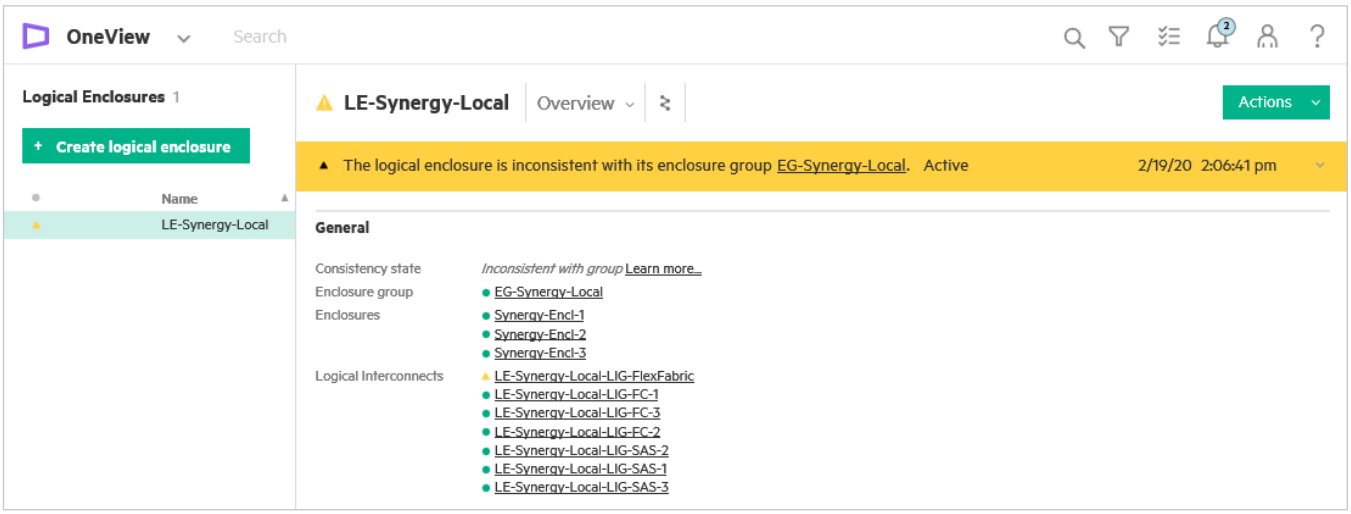
Creation of a final setup snapshot

Once the setup is completed, we can create a snapshot to save the appliance final configuration.

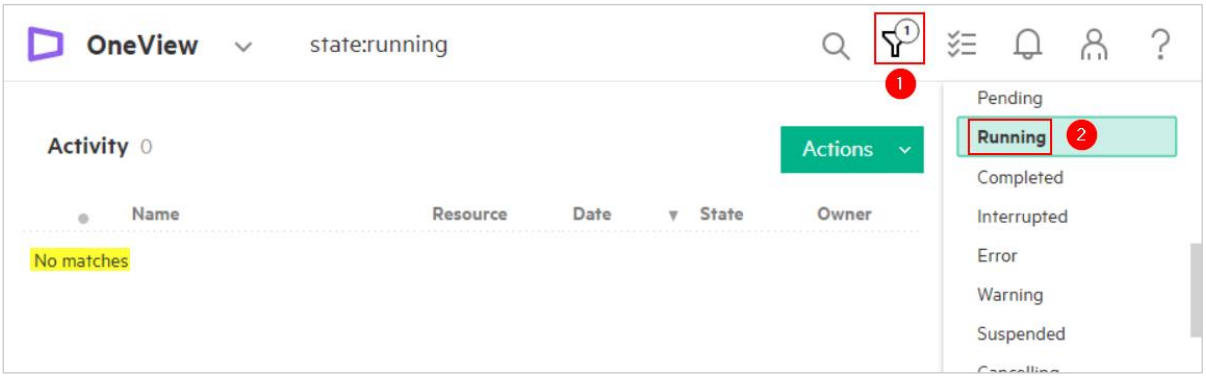
Note: Before creating the snapshot:

- Try to resolve any issues that may be reported by the appliance

  Note: The Logical Enclosure inconsistent error is expected as we don't have any Synergy 8Gb FC Upgrade licenses.



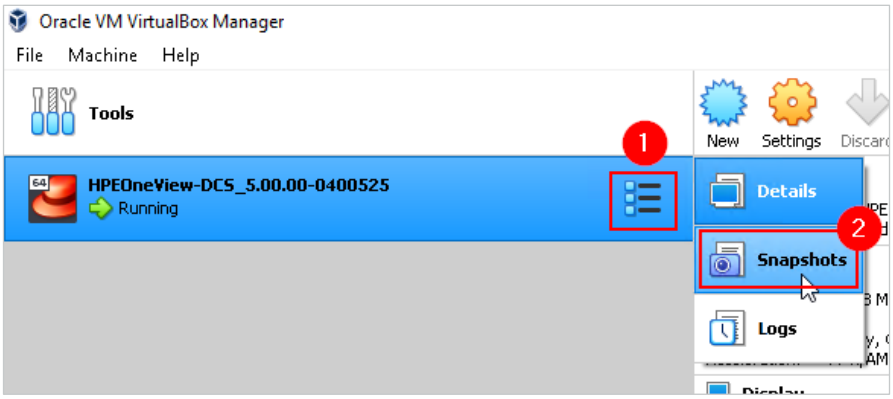
- Make sure there is no OneView tasks that is still running
  - Go in OneView / **Activity** then use **Running** State in the Filter tool:



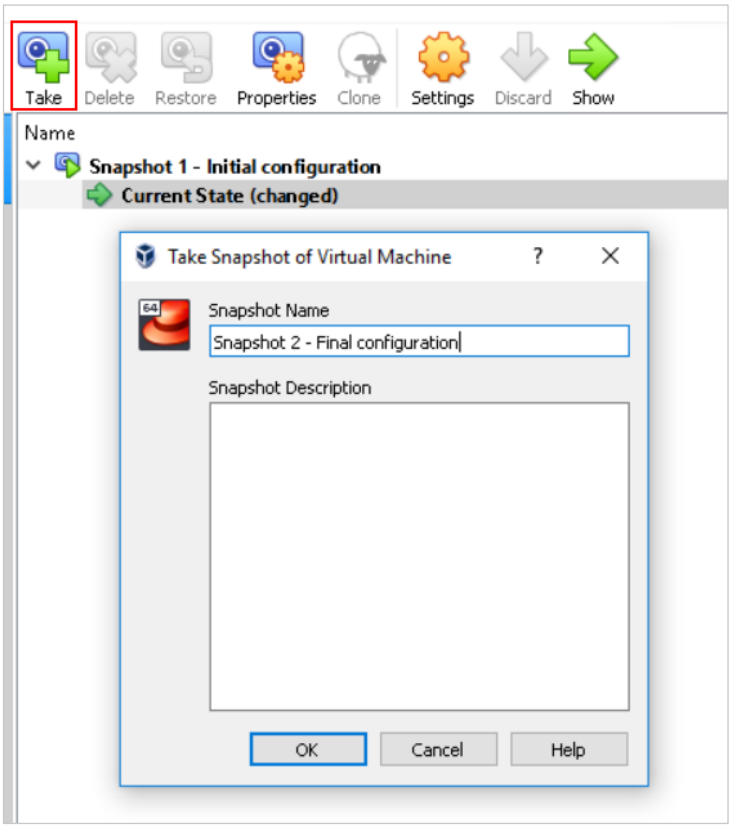
Note: Taking a snapshot while the appliance is running is a key practice to avoid waiting long minutes for the appliance to start.

To create a snapshot to save the appliance final configuration:

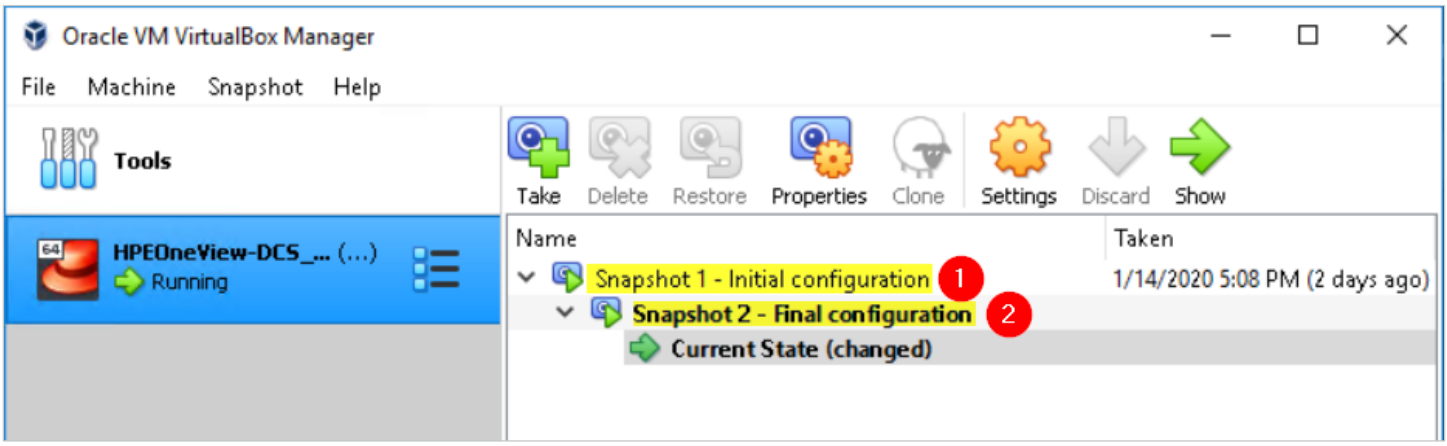
- Go to the VirtualBox interface, select the **Tools** menu then **Snapshots**



- Then press on **Take**, enter a snapshot name like **Snapshot 2 – Final configuration** then click **OK**



To sum up, we have now two snapshots:



1- First snapshot to show how to automate the setup of Synergy and the power of our infrastructure as code implementation. OneView appliance first time setup is done (IP addresses set, discovery of all enclosures and servers is done) but the Synergy frames are not configured (no LE, no LIG, no EG, no network).

2- Second snapshot is with a fully configured environment to demonstrate features of the Composable infrastructure like creating server profiles, adding networks, modifying VC configuration, etc.

Chapter-7 – Preparing the live demonstration scenarios

Demonstrating Synergy Composer and OneView Key features

If you simply want to highlight the Synergy/OneView key features, you can refer to the latest *HPE OneView Deployment and Management Guide* you can find in the OneView documentation.

Demonstrating Infrastructure programmability

To demonstrate Software-Defined infrastructure, infrastructure programmability and total datacenter automation with OneView/Synergy and positively impact our customers, we need some good preparation.

If you need to introduce the REST API, show the resource model, show a typical OneView object content, etc. we usually recommend the use of Postman. In *Postman - Scenario 1* we provide some guidelines to drive you into the REST API introduction speech.

To demonstrate any aspects of the Software Defined Infrastructure, you can use the tons of PowerShell scripts available on various GitHub repos, however, to help you, we have built three PowerShell scenarios showing:

- A day-to-day operation task automation
- A report creation
- Accelerating a configuration change.

For Python, we have two scenarios:

- A script to automate the creation of a server profile
- A report creation
- Accelerating a configuration change.

For Ansible, we have three scenarios:

- A playbook to collect information in OneView
- A playbook to automate the provisioning of several servers
- A playbook to unprovision several servers automatically

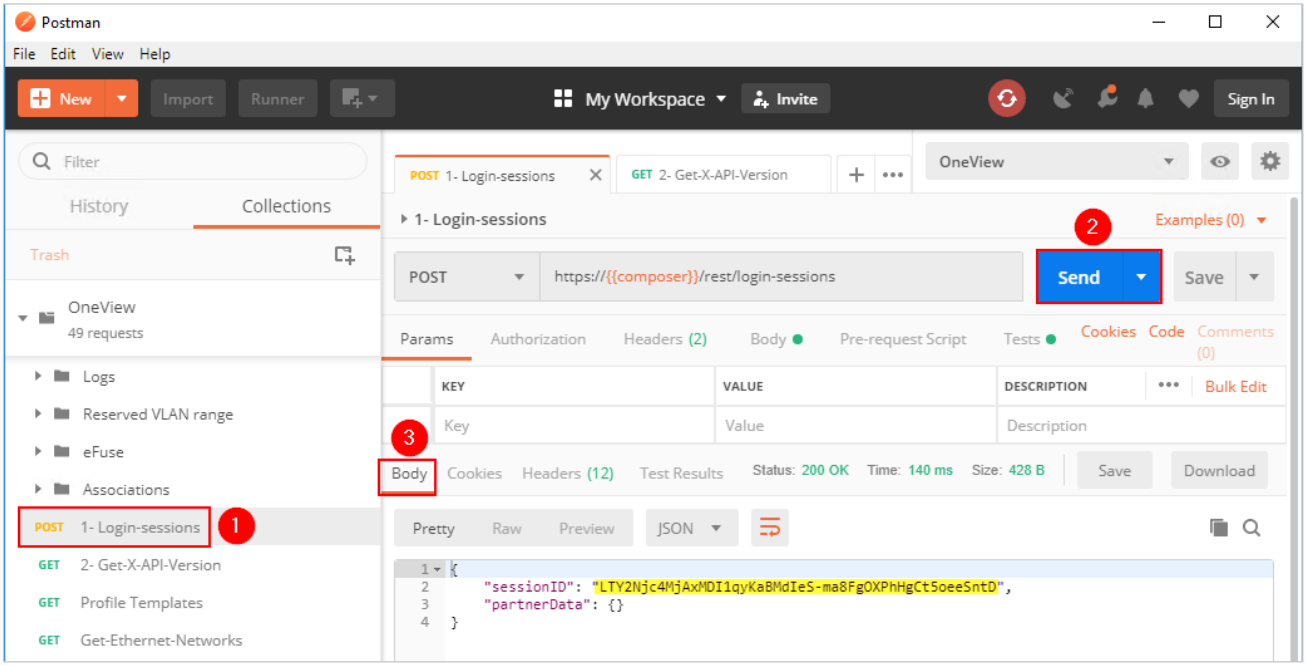
More scenarios will be added over time…

Postman - Scenario 1 – Introduction to the OneView REST API

Notice: This scenario can be run with either the initial or final configuration snapshot.

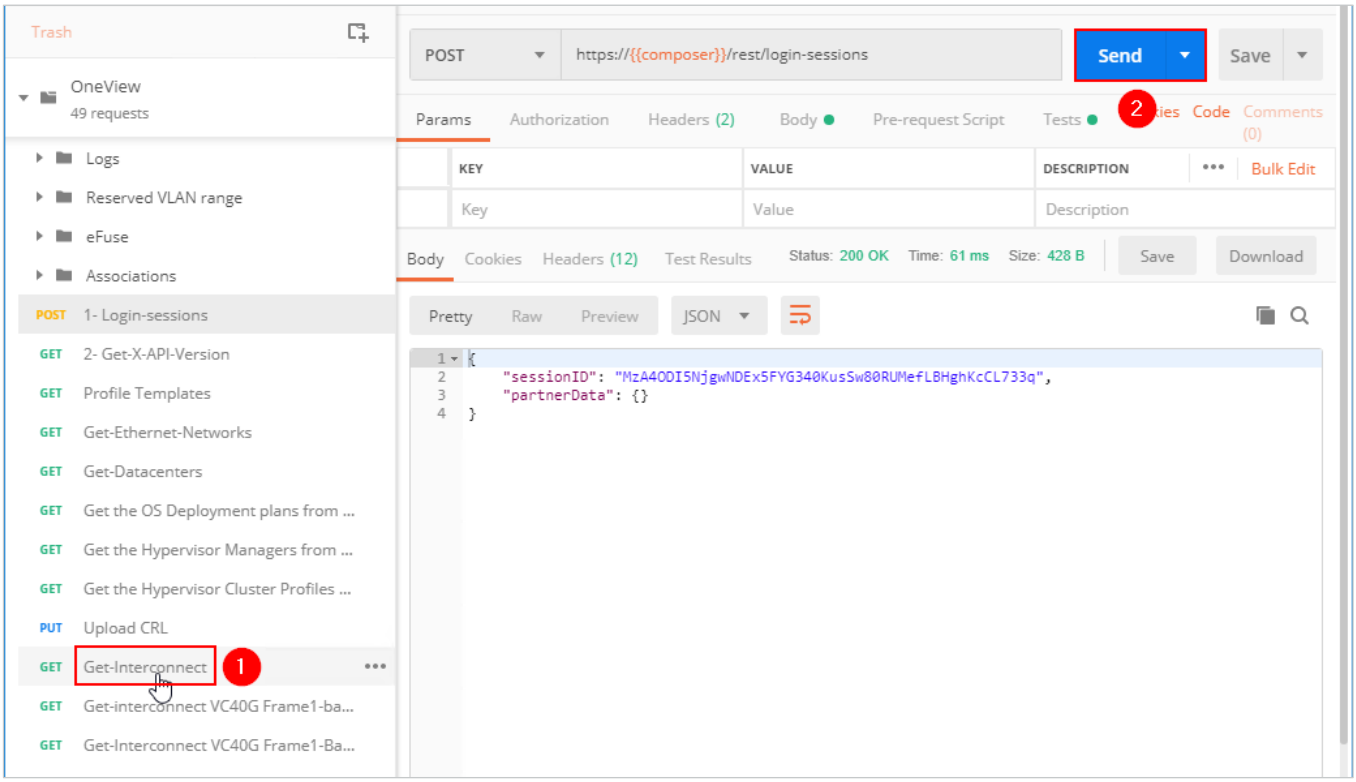
In this scenario, we are going to use Postman to show the OneView resource model, and some typical OneView object content:

- Open **Postman**
- Select **1-Login-sessions** from the collection pane, then press **Send**



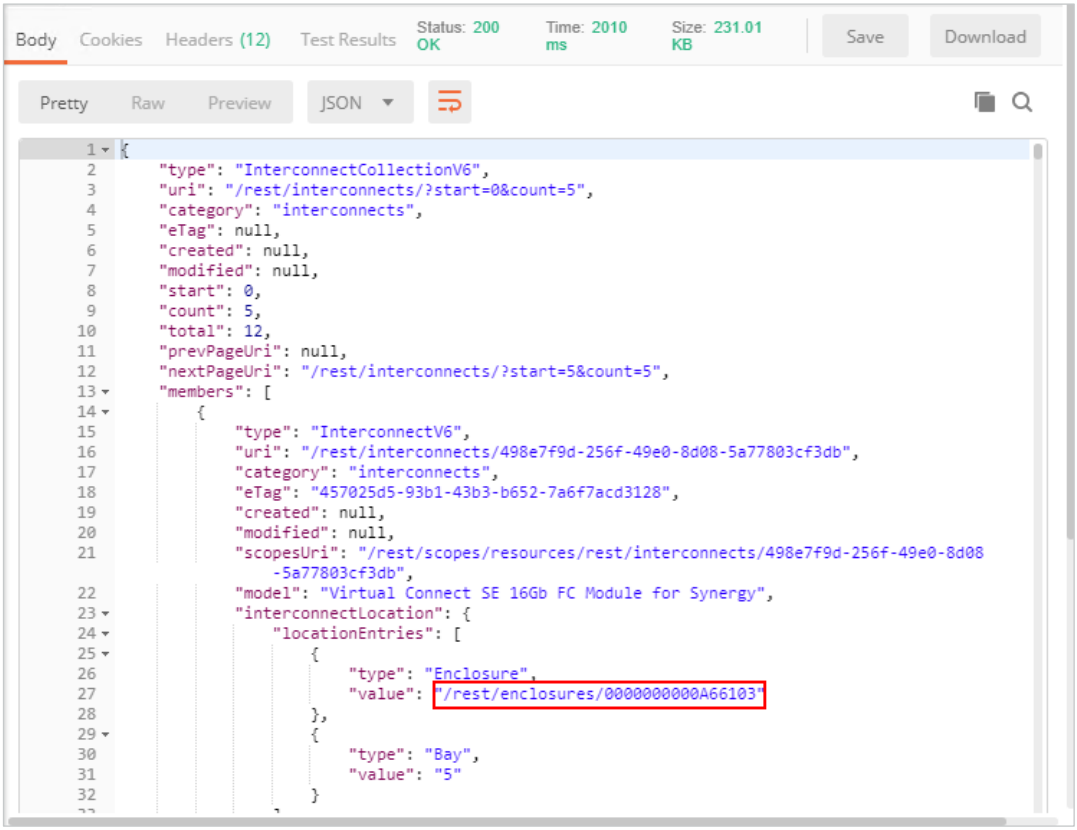
- Explain `sessionID` is our API authentication token that will be used to pass all other REST calls.

- Next select **Get-Interconnect** and press **Send**

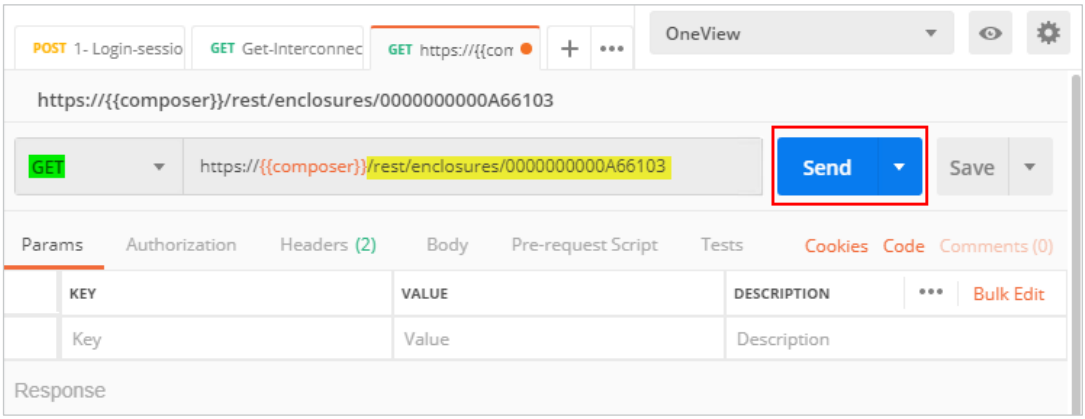


- The response displays all interconnects managed by OneView

- Click on the enclosure link of the first interconnect

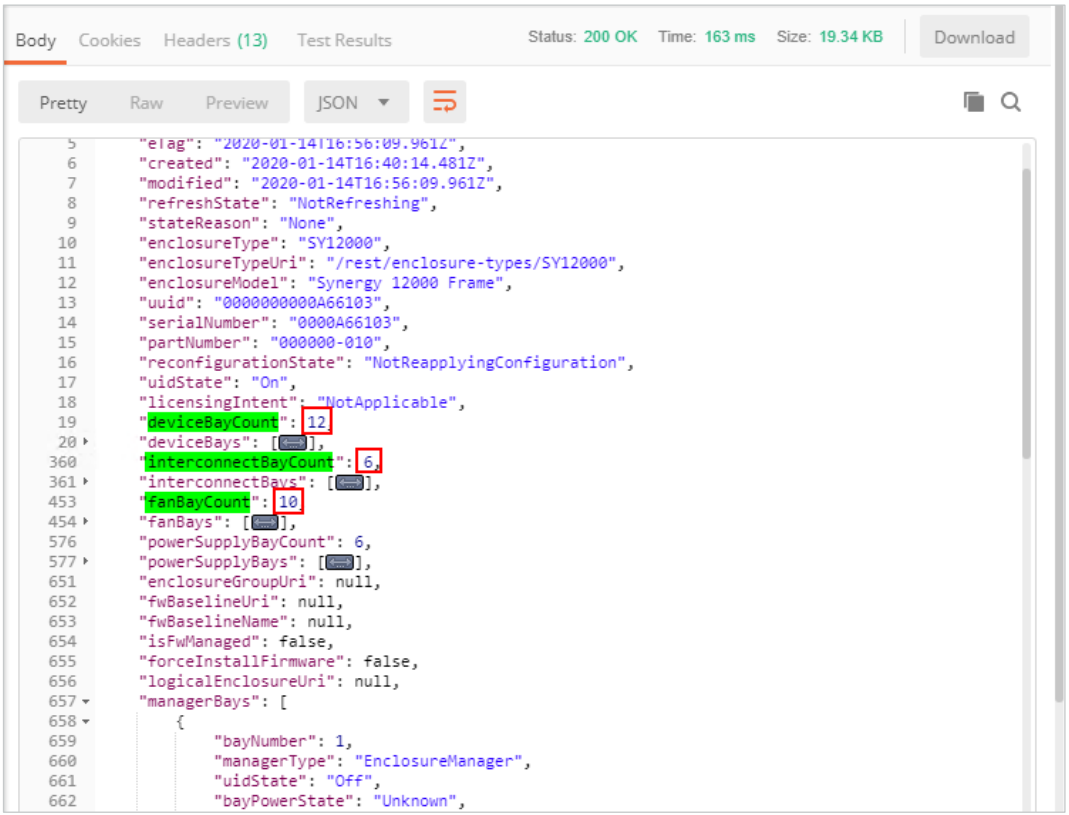


- Notice that when doing so, Postman creates a **GET** request using this URI, press **Send**



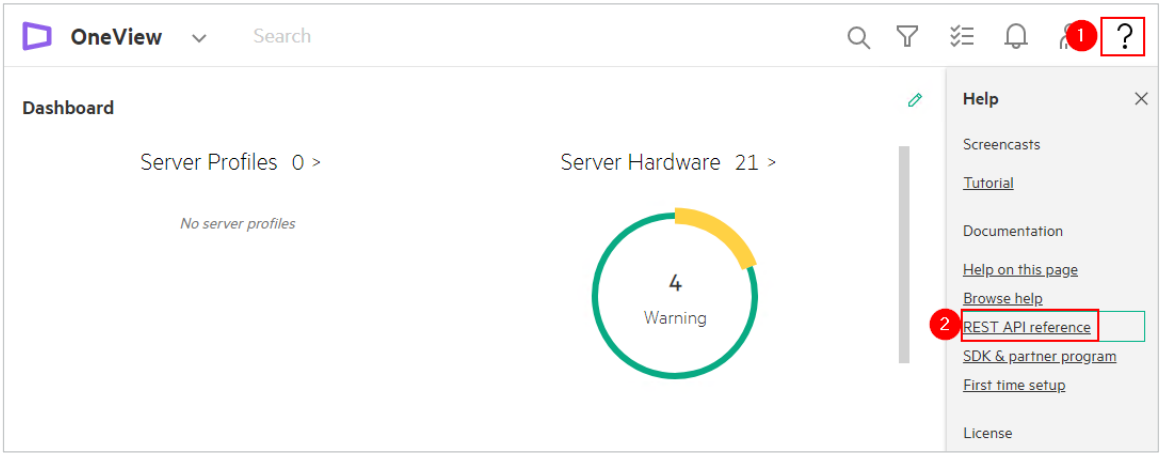
- The response provides information about the enclosure UUID `0000000000A66103`

- Explain quickly the different components that are found in the JSON response body, an enclosure with 12 Compute bays, 6 Interconnect bays and 10 Fans, etc.

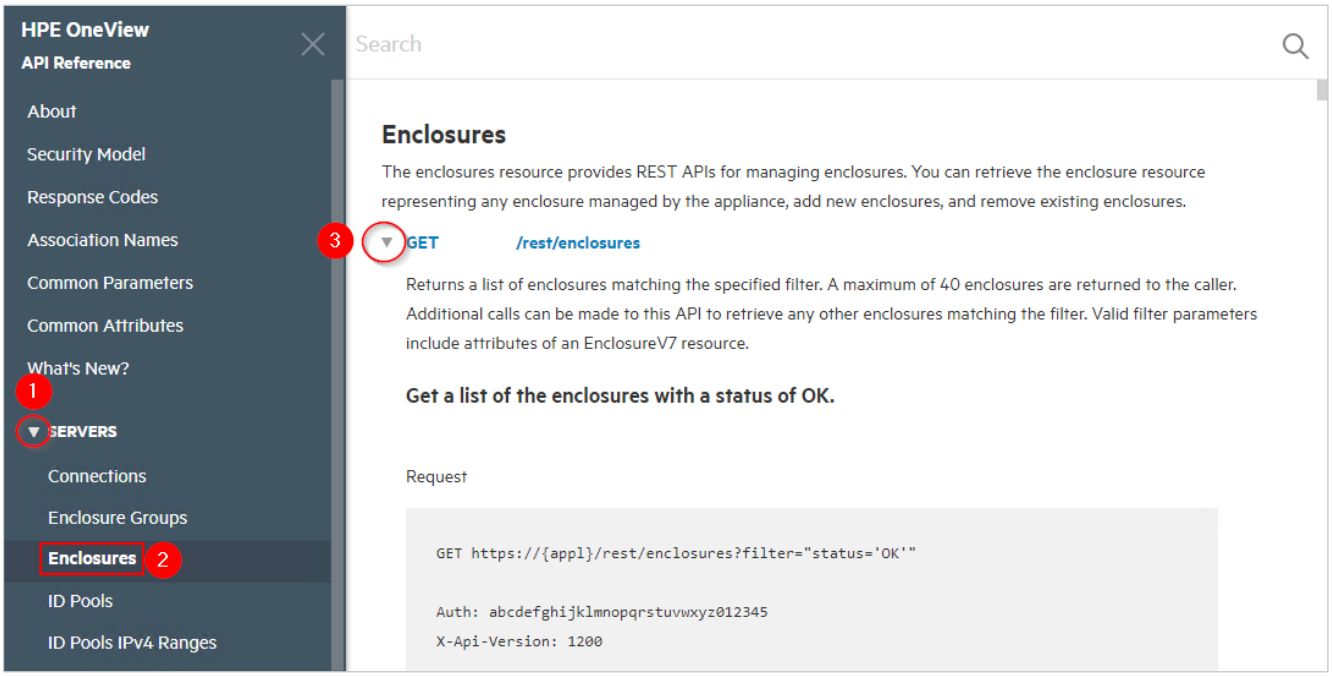


Note: You can use the expand icon to unfold the different sections to get a better display

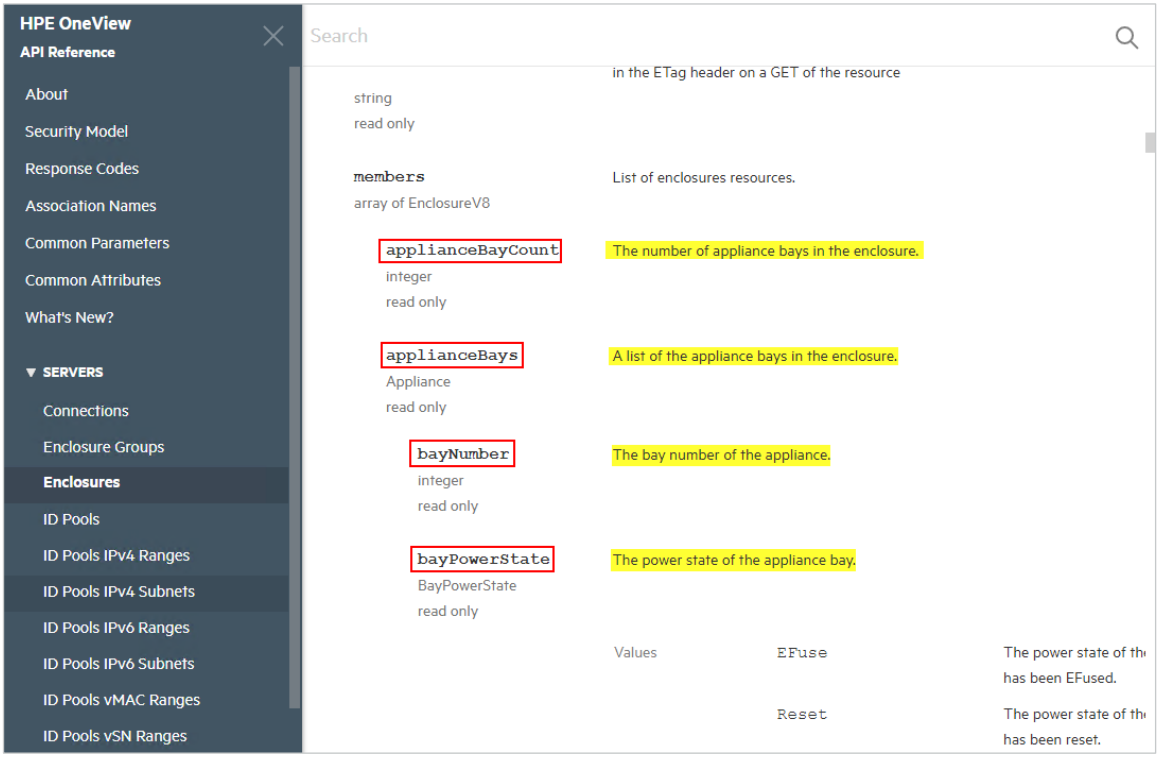
- A description of all these components is available in the REST API Reference document accessible from the Help section of OneView



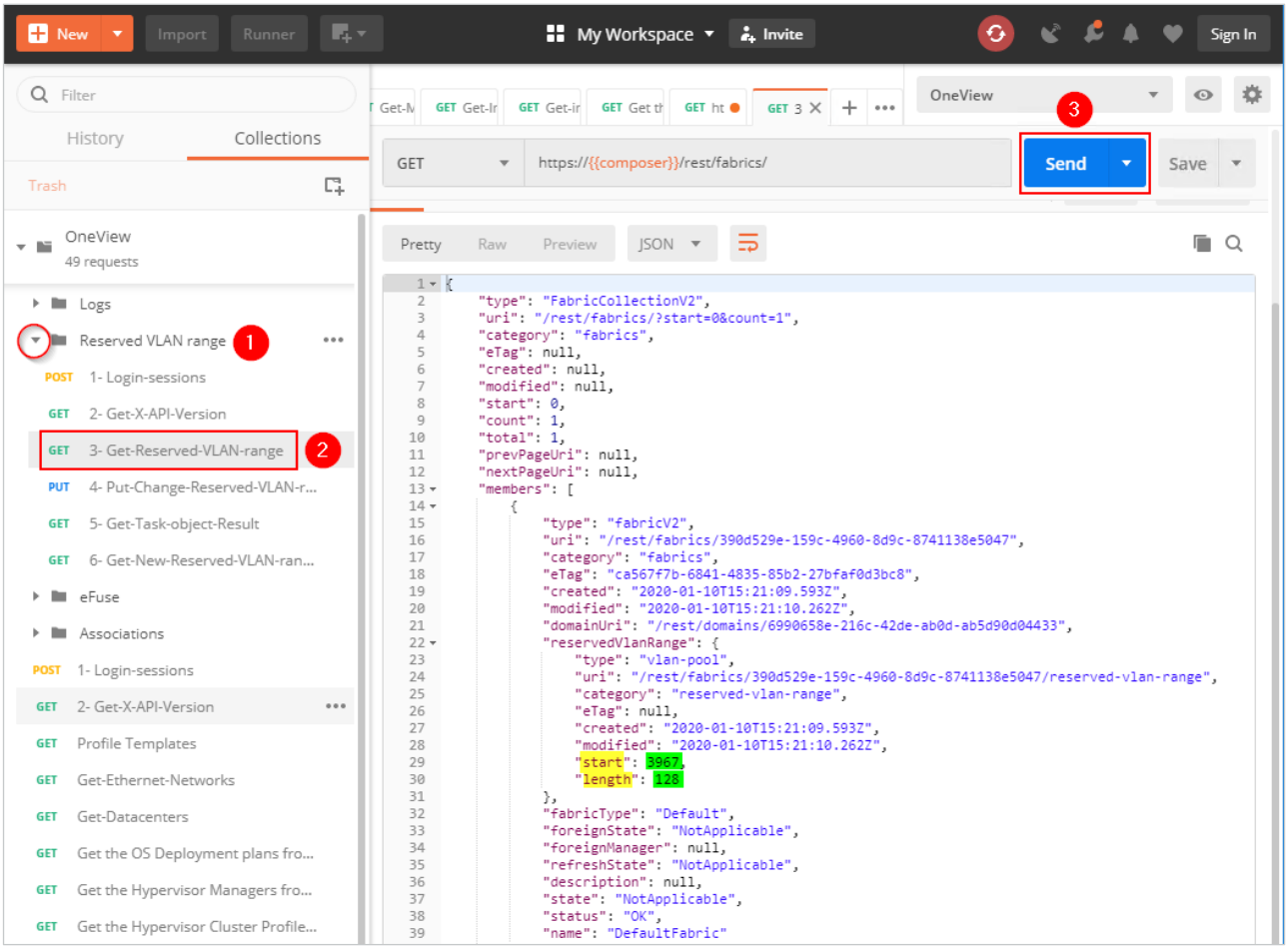
- In the REST API Reference document, select **Server** / **Enclosure** / **Get /rest/enclosures**



- Scroll-down to **Response Body** and show the different component with their descriptions



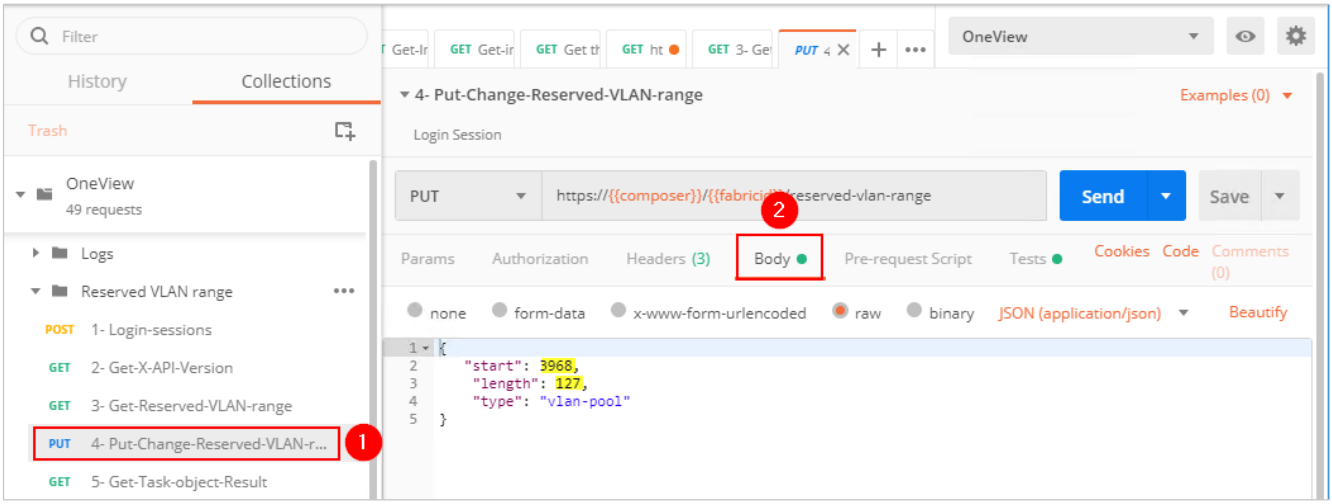
- Next you can show the Reserved VLAN range set in OneView, this information can only be accessible from the REST API, in other words, it cannot be found in the GUI. Expand **Reserved VLAN range**, select **3-Get-Reserved-VLAN-range** then press **Send**



Note: There is a reserved VLAN pool, a range of VLANs used for Tunnel, Untagged and Native FC networks. These VLAN IDs are reserved and cannot be used. `128` is the default reserved range [3967-4094]. The minimum size of the pool must be `60` VLANs [4035-4094] to ensure the pool is not exhausted.
The pool can only be reduced using the REST API.

Note: The OneView PowerShell library provides a cmdlet to change the Reserved VLAN range:
`Set-HPOVReservedVlanRange -start 4035 -Length 60`

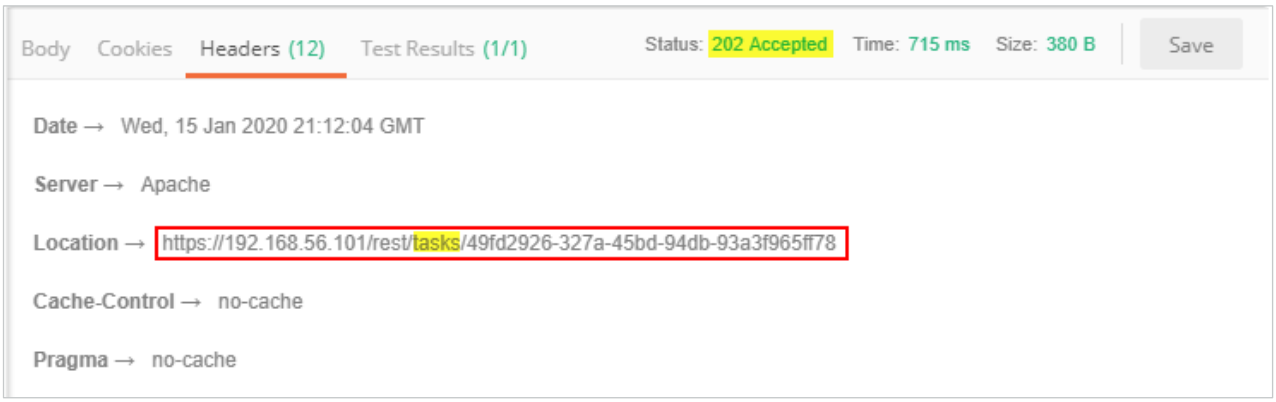
- To demo how to reduce the reserved range, you can run the next REST query in the list: **4- Put-Change-Reserved-VLAN-range** then select **Body**



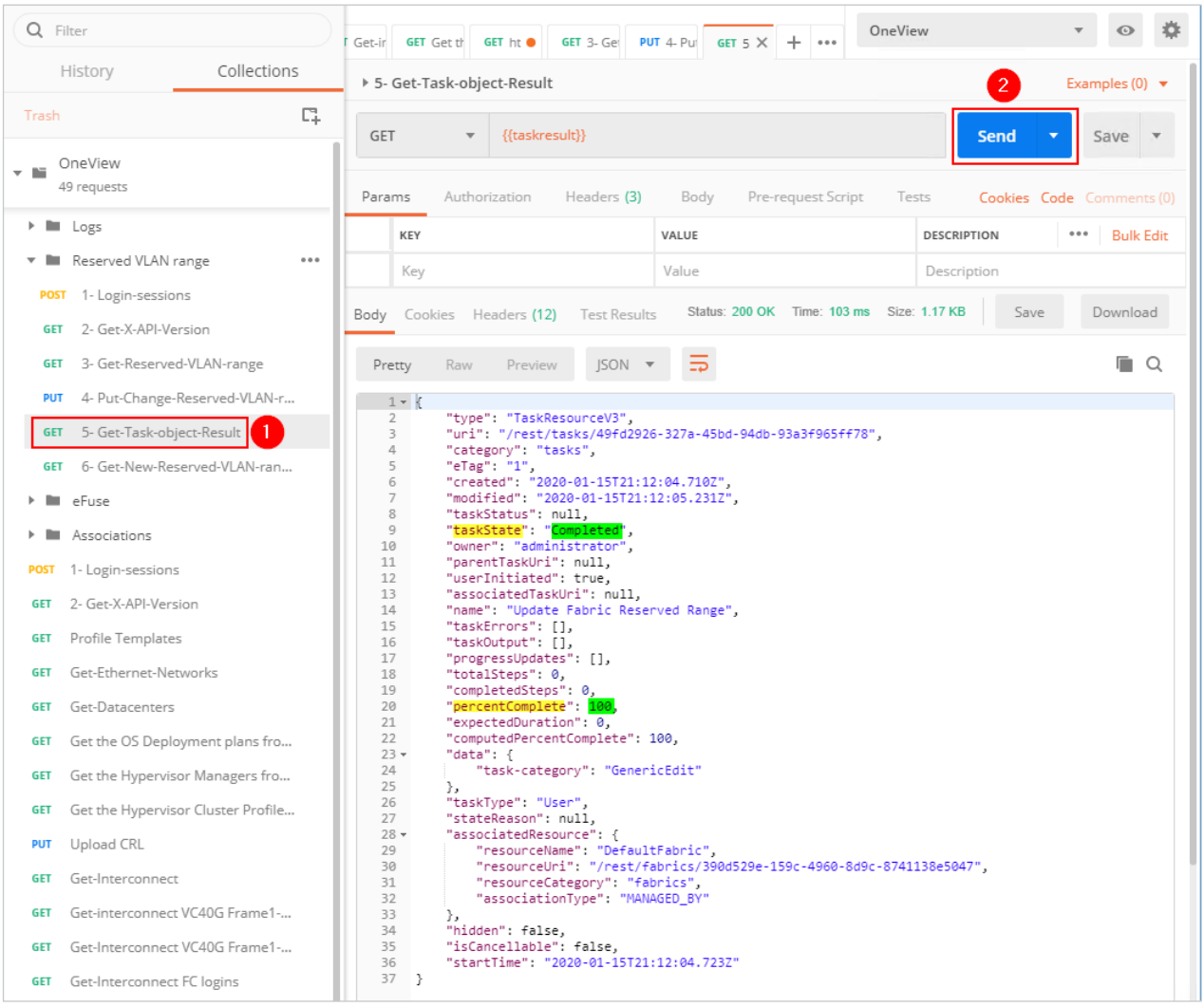
- This example shows how to reduce the reserved VLAN to `127` VLANs and set the reserved range to [3968-4094] releasing VLAN 3967 for other use like in a Cisco ACI environment.

  Note: VLAN 3967 is a recommended Cisco choice for the ACI infrastructure VLAN

- Click **Send** to modify the reserved range. You should not see any Body Response. This is as expected. This request does not return any Body but a Headers response with a task ID.

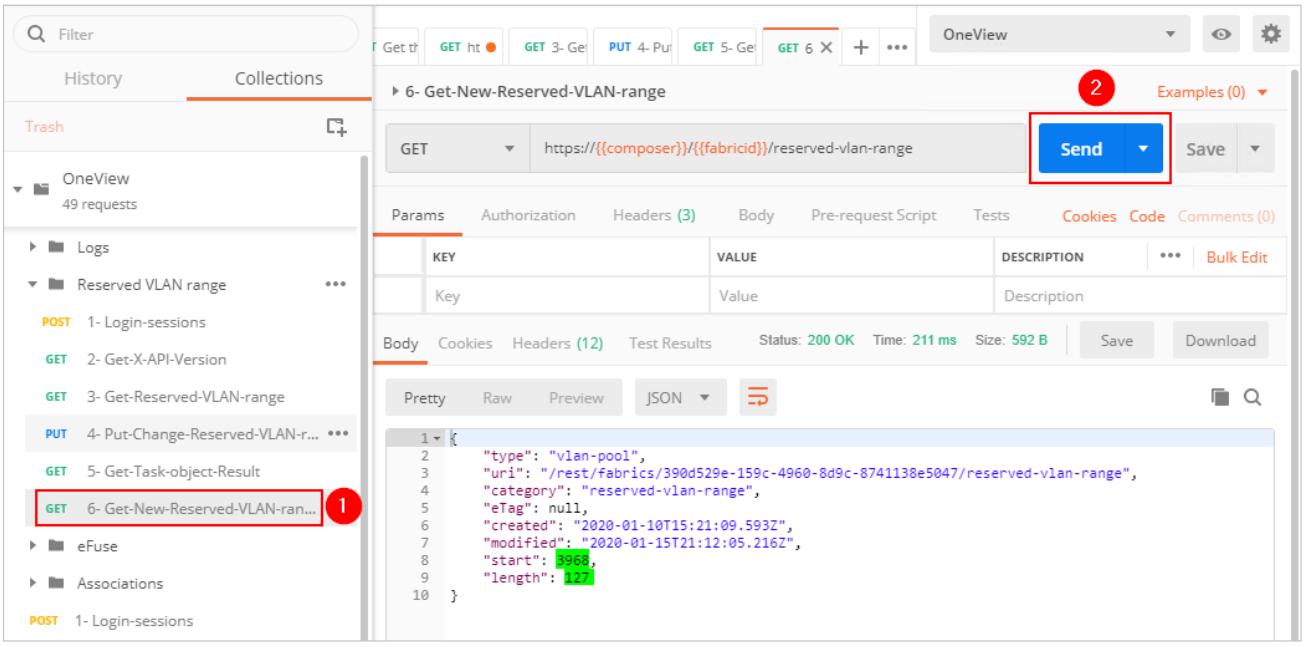


- Select the next REST call in the list **5- Get-Task-object-Result** to query this task ID, press **Send**



- You should see the task completion in the response body

- Select step **6- Get-New-Reserved-VLAN-range** call then press **Send**



- You should see the new reserved range starting now at VLAN 3968 as requested

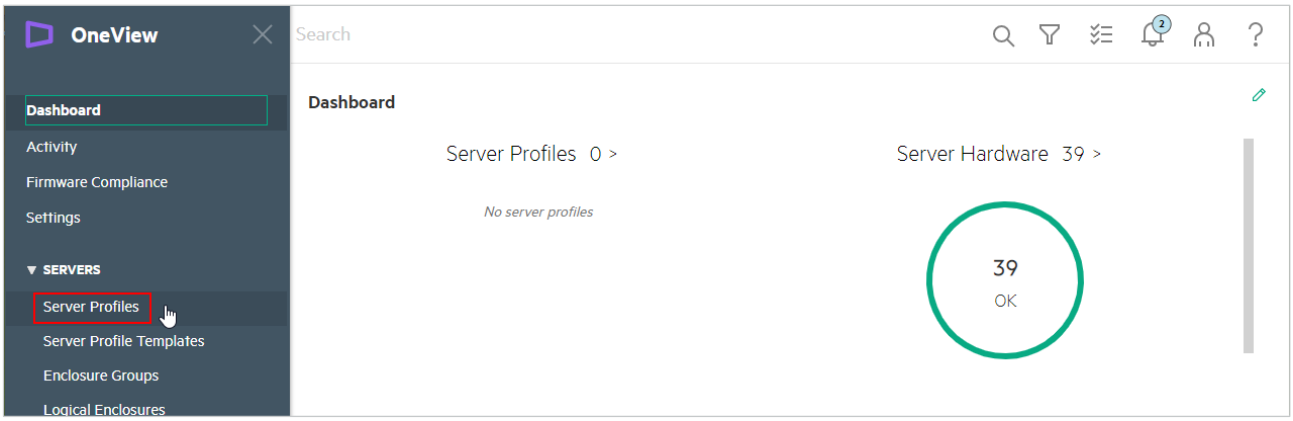
This concludes Postman – scenario 1

PowerShell – Scenario 1 - Day-to-day operation task automation

In this scenario, we are going to show how easy it is to generate script code from existing OneView resources. The code generated is a starting point to be used for repeating similar tasks performed by the UI, or to incorporate into scripts or workflows.

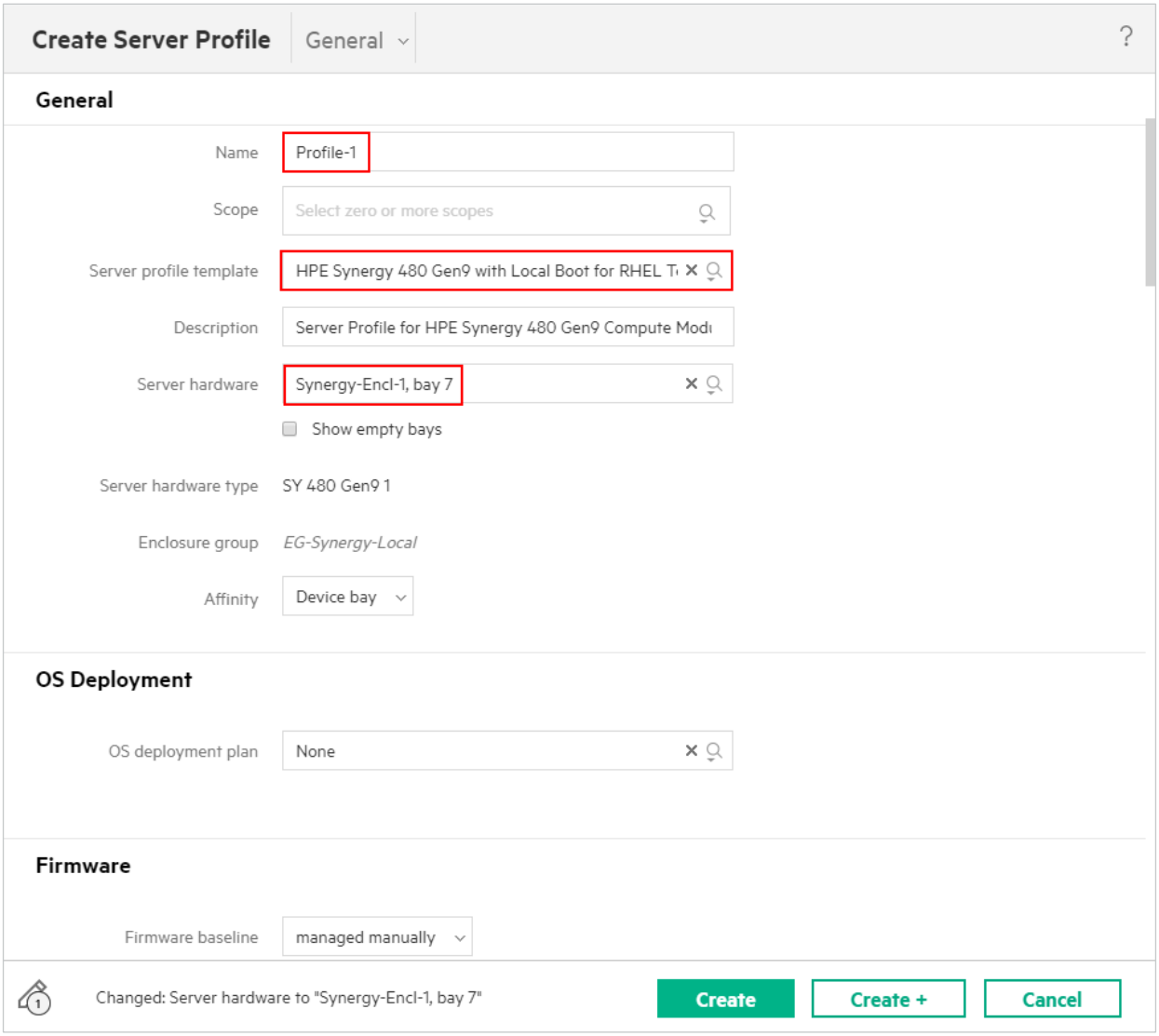
Import notice: This scenario can only be run with the Final configuration snapshot (i.e. when a Logical Enclosure is available)

- Open OneView GUI, log in using **Administrator / password**
- Go to **Server Profiles**



- Click on **Create profile**

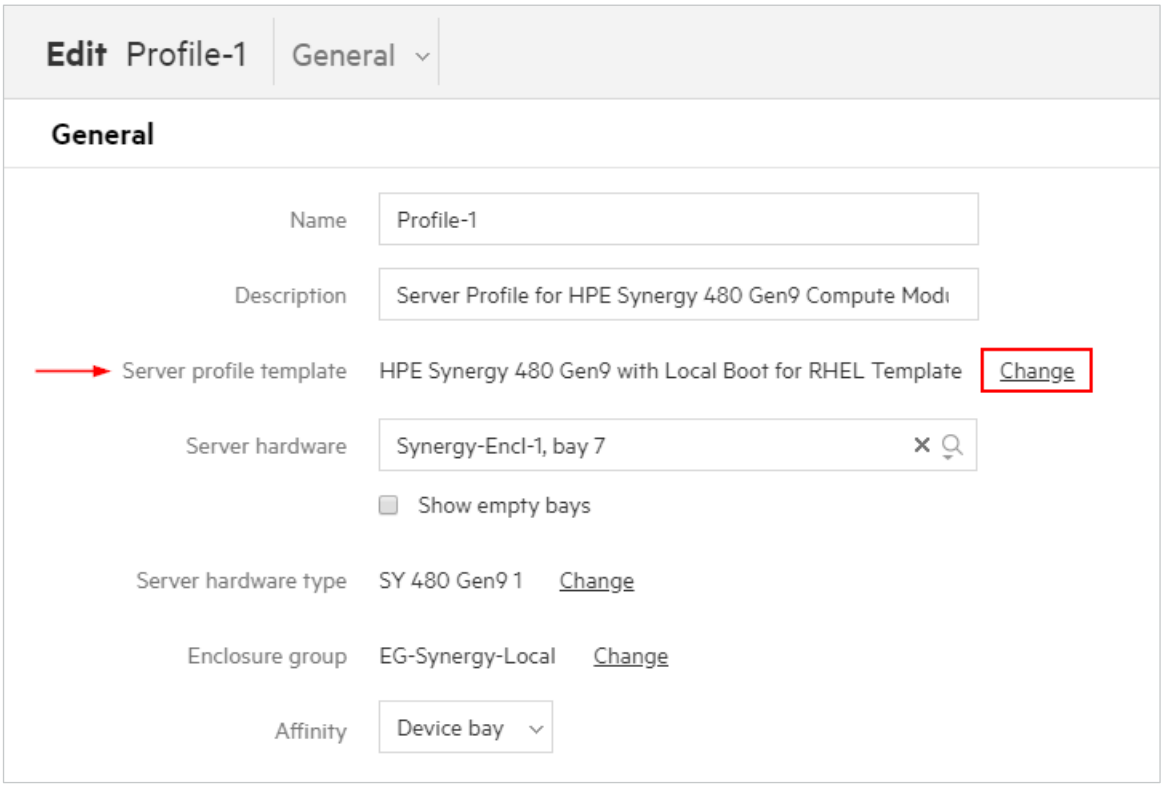
- Name the profile **Profile-1**, use the server hardware **Synergy-Encl-1, bay 7** with the Server Profile Template **HPE Synergy 480 Gen9 with Local Boot for RHEL Template**:



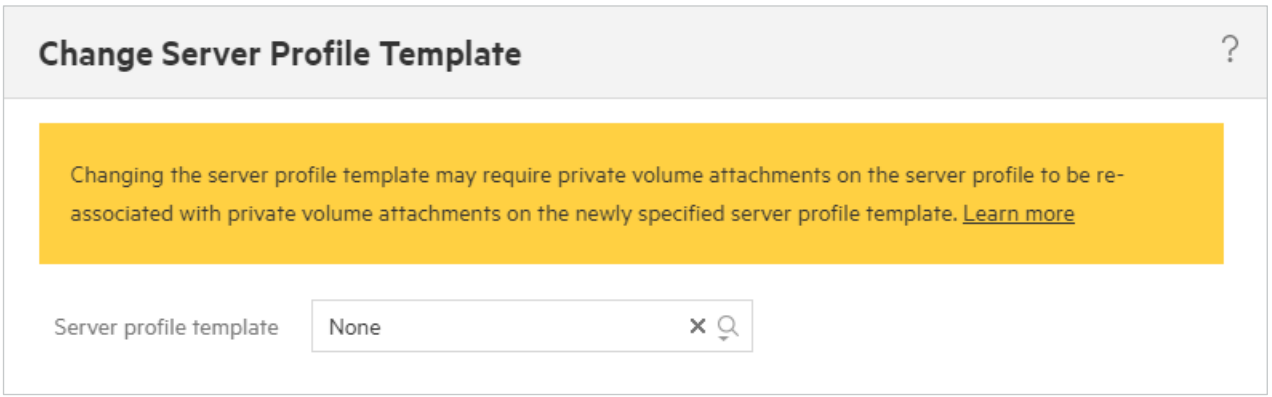
- Then click **Create**

Once created, it is necessary to unlink the server Profile from the Server Profile Template to get the most from the `ConvertTo-HPOVPowerShellScript` cmdlet that we are going to use next.

- **Edit** the Profile then click **Change** remove the Server Profile Template



- Then select **None** in the dropdown menu and click **OK** twice



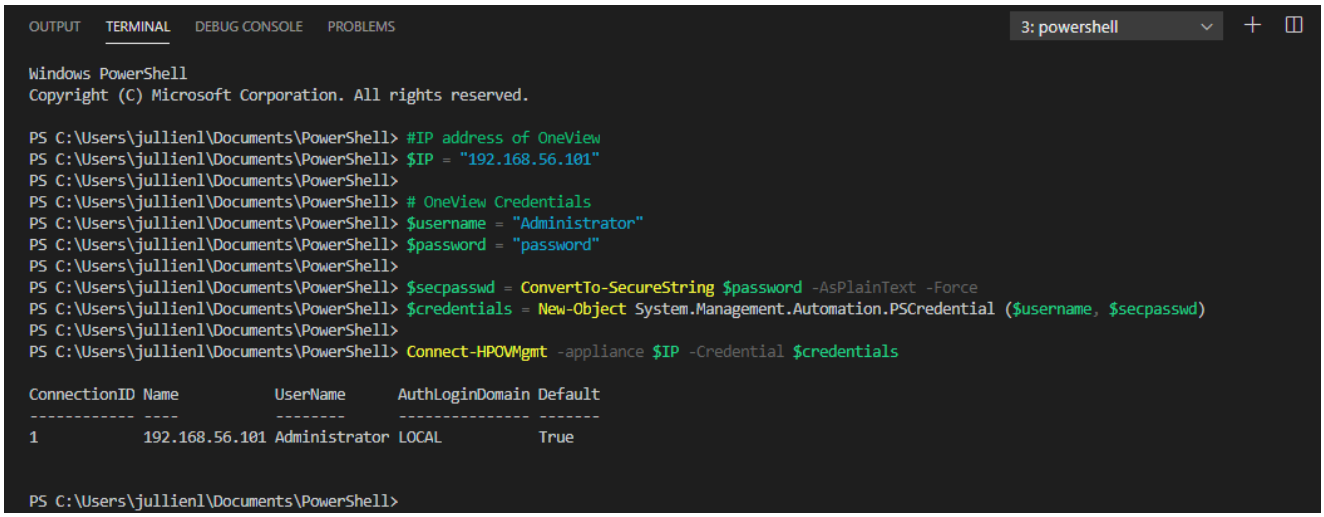
- Open VS Code using the **Synergy demonstrations on Windows** workspace

- Copy/paste the following commands in the console to connect to OneView:

```
#IP address of OneView
$IP = "192.168.56.101"

# OneView Credentials
$username = "Administrator"
$password = "password"

$secpasswd = ConvertTo-SecureString $password -AsPlainText -Force
$credentials = New-Object System.Management.Automation.PSCredential ($username, $secpasswd)

Connect-HPOVMgmt -appliance $IP -Credential $credentials
```

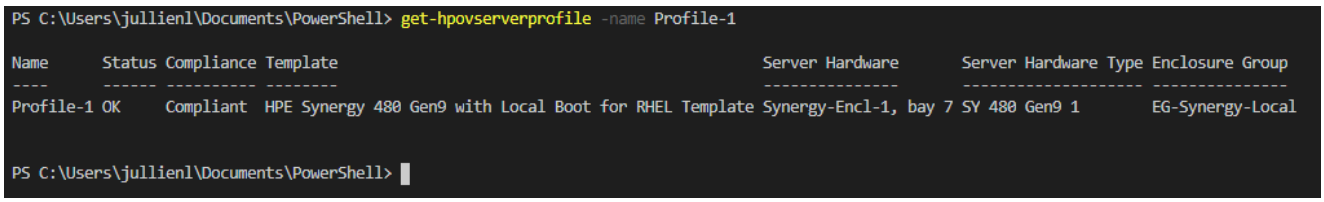
Note: You can open the PowerShell console using **CTRL** + **SHIFT** + `

- A OneView connection confirmation should be displayed:



- Next, we can use the `get-hpovserverprofile` cmdlet to get the list of server profiles. To reduce the response to our server profile, we can enter:

```
get-hpovserverprofile -name Profile-1
```



- The next step is to use the `ConvertTo-HPOVPowerShellScript` to generate the required lines of code to produce this server profile.

```
Get-HPOVServerProfile -Name Profile-1 | ConvertTo-HPOVPowerShellScript
```

```
PS C:\Users\Administrator.lj\Documents\DCS Appliance> Get-HPOVServerProfile -Name Profile-1 | ConvertTo-HPOVPowerShellScript
# -------------- Attributes for ServerProfile "Profile-1"
$name                   = "Profile-1"
$server                 = Get-HPOVServer -Name "Synergy-Encl-1, bay 11"
$affinity               = "Bay"
# -------------- Attributes for connection "1"
$connID                 = 1
$connType               = "Ethernet"
$netName                = "ESX Mgmt"
$ThisNetwork            = Get-HPOVNetwork -Type Ethernet -Name $netName
$portID                 = "Mezz 3:1-a"
$requestedMbps          = 2500
$Conn1                  = New-HPOVServerProfileConnection -ConnectionID $connID -ConnectionType $connType -Network $ThisNetwork
rtID -RequestedBW $requestedMbps
# -------------- Attributes for connection "2"
$connID                 = 2
$connType               = "Ethernet"
$netName                = "ESX Mgmt"
$ThisNetwork            = Get-HPOVNetwork -Type Ethernet -Name $netName
$portID                 = "Mezz 3:2-a"
$requestedMbps          = 2500
```

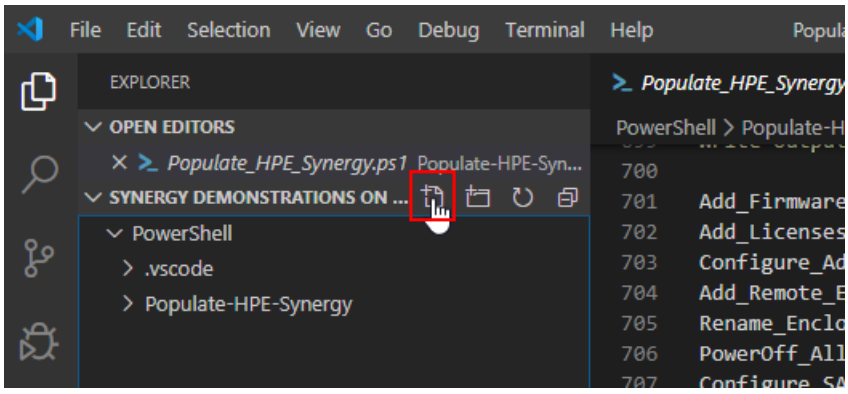
Explain to the customer that this cmdlet can assist administrators or scripters to help generate script code from specific resources. The code generated is a starting point to be used for repeating similar tasks performed by the UI, or to incorporate into scripts or workflows.

Note: Not all resources are supported by `ConvertTo-HPOVPowerShellScript`, you can use the `Get-Help` command to see the list of supported resources: `Get-help ConvertTo-HPOVPowerShellScript`

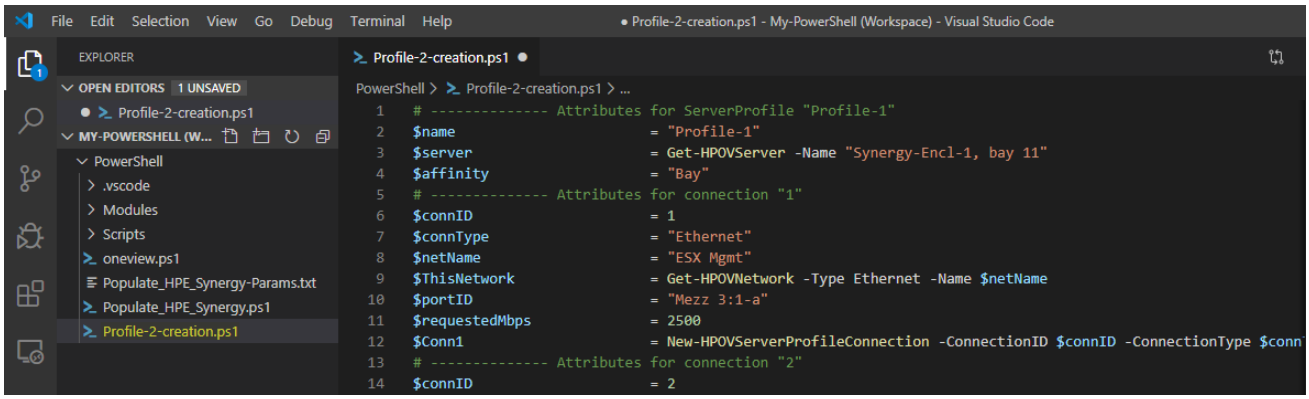
- Lastly, to disconnect properly the PowerShell client to the appliance, enter:

```
Disconnect-HPOVMgmt
```

- You can create now a new file using **New File**



- Name it **Profile-2-creation.ps1**. Make sure you name the new file with a *.ps1* extension.
- Copy/paste the code generated by `ConvertTo-HPOVPowerShellScript` in this new PowerShell script



- Next, we can show the creation of a new Server Profile by changing a few settings in the code.
- First, we need to connect to the appliance, add the following lines at the beginning of the script:

```
#IP address of OneView
$IP = "192.168.56.101"

# OneView Credentials
$username = "Administrator"
$password = "password"

$secpasswd = ConvertTo-SecureString $password -AsPlainText -Force
$credentials = New-Object System.Management.Automation.PSCredential ($username, $secpasswd)

Connect-HPOVMgmt -appliance $IP -Credential $credentials
```

- Then change the following values:
    - `$name` with **Profile-2**
    - `$server` with **Synergy-Encl-2, bay 7**
    - The requested bandwidth of connection **1** and **2** to **7500** Mbps

```
PowerShell > Profile-2-creation.ps1 > ...
11  Connect-HPOVMgmt -appliance $IP -Credential $credentials
12
13
14  # -------------- Attributes for ServerProfile "Profile-2"
15  $name                       = "Profile-2"
16  $description                = "Server Profile for HPE Synergy 480 Gen9 Compute Module with Local Boot for RHEL"
17  $server                     = Get-HPOVServer -Name "Synergy-Encl-2, bay 7"
18  $affinity                   = "Bay"
19  # -------------- Attributes for connection "1"
20  $connID                     = 1
21  $connName                   = "Prod-NetworkSet-1"
22  $connType                   = "Ethernet"
23  $netName                    = "Prod"
24  $ThisNetwork                = Get-HPOVNetworkSet -Name $netName
25  $portID                     = "Mezz 3:1-c"
26  $requestedMbps              = 7500
27  $Conn1                      = New-HPOVServerProfileConnection -ConnectionID $connID -Name $connName -ConnectionType $connTy
28  # -------------- Attributes for connection "2"
29  $connID                     = 2
30  $connName                   = "Prod-NetworkSet-2"
31  $connType                   = "Ethernet"
32  $netName                    = "Prod"
33  $ThisNetwork                = Get-HPOVNetworkSet -Name $netName
34  $portID                     = "Mezz 3:2-c"
35  $requestedMbps              = 7500
36  $Conn2                      = New-HPOVServerProfileConnection -ConnectionID $connID -Name $connName -ConnectionType $connTy
37  # -------------- Attributes for connection "3"
38  $connID                     = 3
39  $connName                   = "Deployment Network A"
40  $connType                   = "Ethernet"
41  $netName                    = "Deployment"
42  $ThisNetwork                = Get-HPOVNetwork -Type Ethernet -Name $netName
43  $portID                     = "Mezz 3:1-a"
44  $requestedMbps              = 2500
45  $bootPriority               = "Primary"
46  $volSource                  = ""
47  $Conn3                      = New-HPOVServerProfileConnection -ConnectionID $connID -Name $connName -ConnectionType $connTy
48  # -------------- Attributes for connection "4"
49  $connID                     = 4
50  $connName                   = "Deployment Network B"
51  $connType                   = "Ethernet"
52  $netName                    = "Deployment"
53  $ThisNetwork                = Get-HPOVNetwork -Type Ethernet -Name $netName
54  $portID                     = "Mezz 3:2-a"
55  $requestedMbps              = 2500
56  $bootPriority               = "Secondary"
57  $volSource                  = ""
58  $Conn4                      = New-HPOVServerProfileConnection -ConnectionID $connID -Name $connName -ConnectionType $connTy
59  $connections                = $Conn1, $Conn2, $Conn3, $Conn4
60  # -------------- Attributes for logical disk "SAS RAID1 SSD(RAID1)"
```

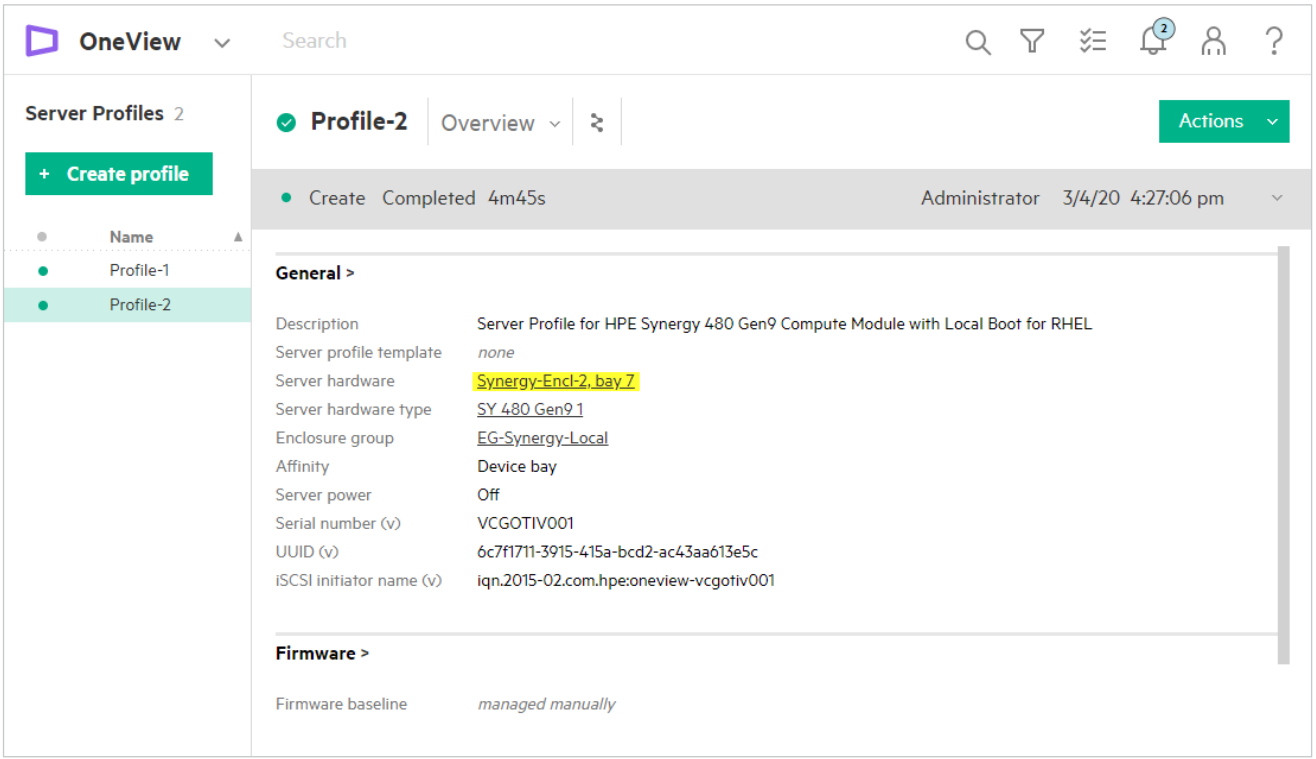
- Then add the following line at the end of the script to disconnect properly the client to the appliance:

```
Disconnect-HPOVMgmt
```

- Once changes completed, save the file by pressing **CTRL** + **S** then press **F5** to run the script.

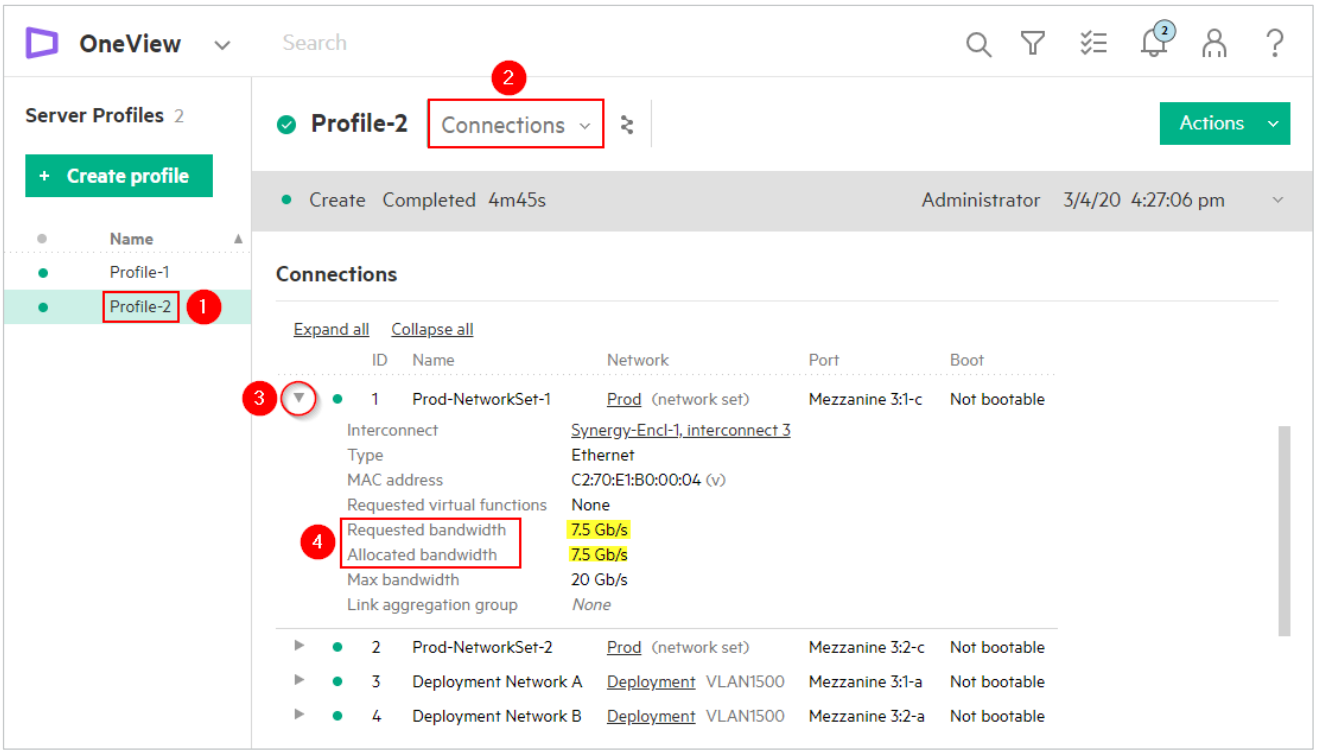
```
# -------------- Attributes for ServerProfile "Profile-1"
$name                   = "Profile-2"
$server                 = Get-HPOVServer -Name "Synergy-Encl-3, bay 11"
$affinity               = "Bay"
# -------------- Attributes for connection "1"
$connID                 = 1
$connType               = "Ethernet"
$netName                = "ESX Mgmt"
$ThisNetwork            = Get-HPOVNetwork -Type Ethernet -Name $netName
$portID                 = "Mezz 3:1-a"
$requestedMbps          = 500
$Conn1                  = New-HPOVServerProfileConnection -ConnectionID $connID -ConnectionType $connT
# -------------- Attributes for connection "2"
$connID                 = 2
$connType               = "Ethernet"

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL        2: PowerShell Integrate

PS C:\Users\Administrator.lj\Documents\DCS Appliance> c:\Users\Administrator.lj\Documents\DCS Appliance\Profile-creation.ps1
```

- You can then jump to the OneView GUI to show the creation of Profile-2



As illustrated above, the profile has been assigned to **Synergy-Encl-2, bay 7** as requested in our code

- To show the new profile parameters that have been changed, click on the **Profile-2**, select **Connections** in the profile menu, expand connection **1** then show the 7500Mbps (*7.5Gps)* requested bandwidth that was defined in our code:



This concludes PowerShell – Scenario 1

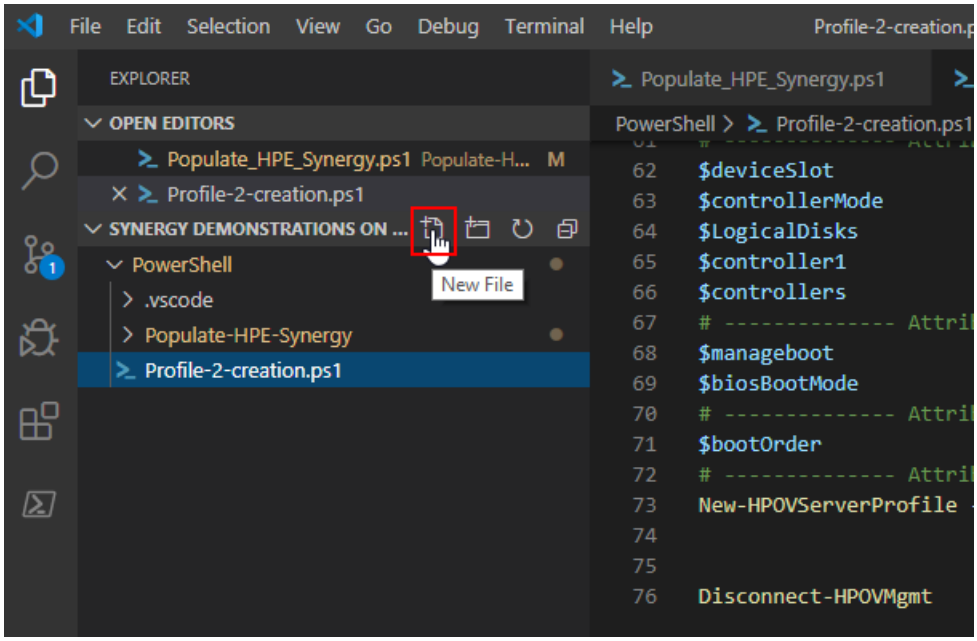
PowerShell – Scenario 2 - Creating a report

In this scenario, we are going to demonstrate how to generate a Synergy FW inventory report of all managed compute modules using the following output format:

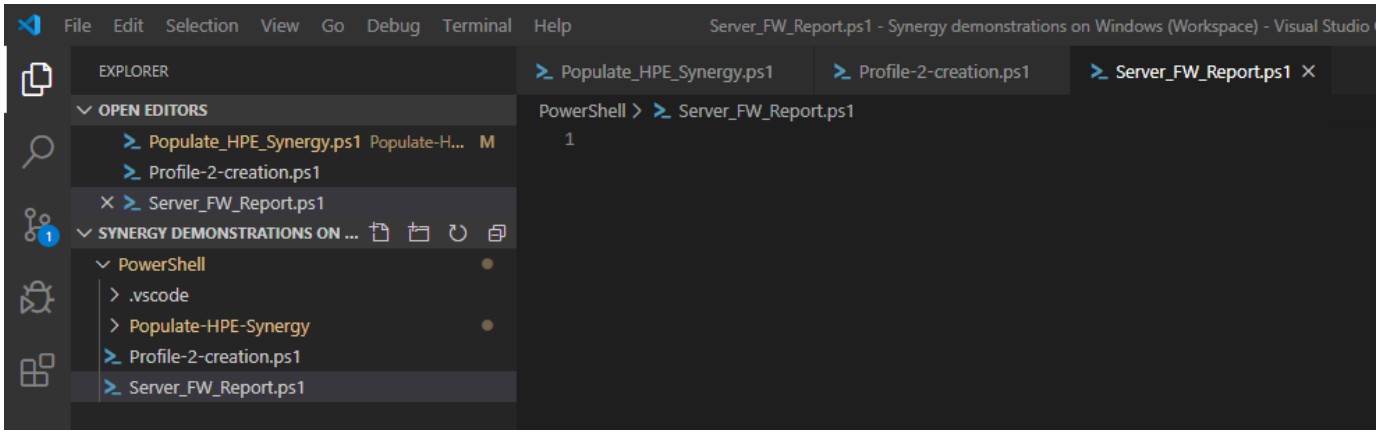
Server Name	Rom Version	Component Name	Component Firmware Version
Server1	P89 v2.42 (04/25/2017)	HPE Smart Storage Battery 1	Firmware 1.1
Server1	P89 v2.42 (04/25/2017)	Intelligent Platform Abstraction	Data 25.05
Server1	P89 v2.42 (04/25/2017)	Smart Array P440ar Controller	2.40

Notice: This scenario can be run with either the initial or final configuration snapshot.

- Create a new file in VS Code



- Name it **Server_FW_Report.ps1**

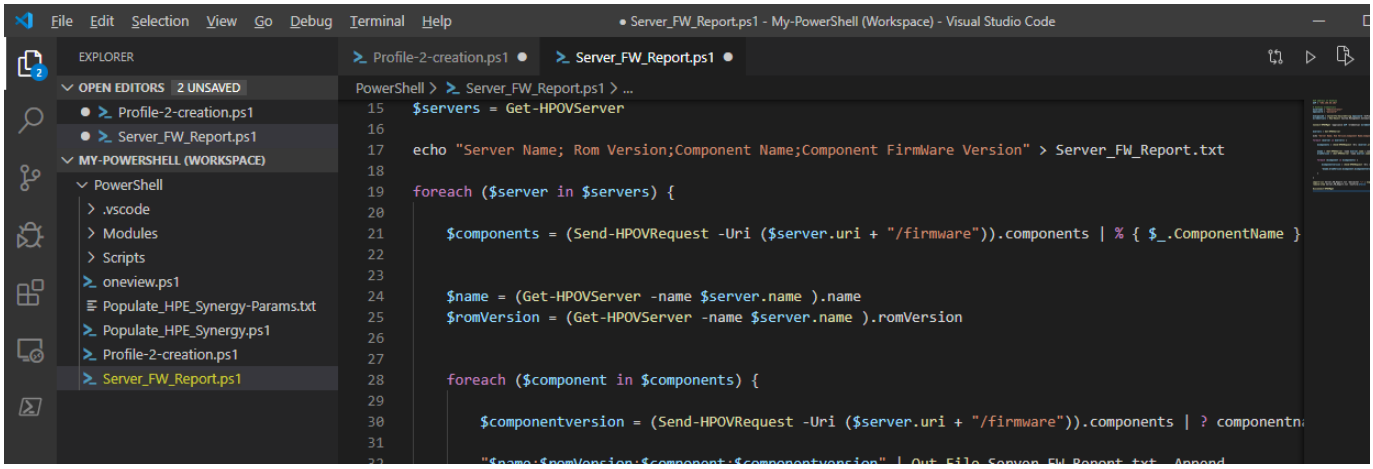


- Copy/paste the following script content in the new VS Code file:

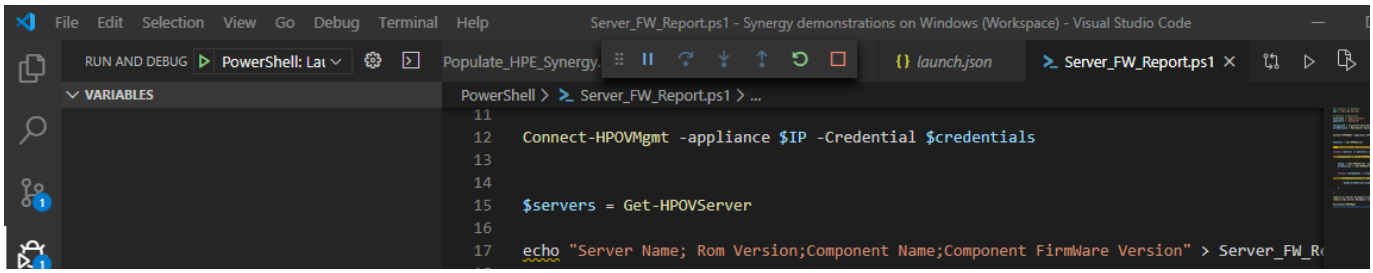
```
#IP address of OneView
$IP = "192.168.56.101"

# OneView Credentials
$username = "Administrator"
$password = "password"

$secpasswd = ConvertTo-SecureString $password -AsPlainText -Force
$credentials = New-Object System.Management.Automation.PSCredential ($username, $secpasswd)


Connect-HPOVMgmt -appliance $IP -Credential $credentials


$servers = Get-HPOVServer

echo "Server Name; Rom Version;Component Name;Component FirmWare Version" > Server_FW_Report.txt

foreach ($server in $servers) {

    $components = (Send-HPOVRequest -Uri ($server.uri + "/firmware")).components | % { $_.ComponentName
}


    $name = (Get-HPOVServer -name $server.name ).name
    $romVersion = (Get-HPOVServer -name $server.name ).romVersion


    foreach ($component in $components) {

        $componentversion = (Send-HPOVRequest -Uri ($server.uri + "/firmware")).components | ?
componentname -eq $component | select componentVersion | % { $_.componentVersion }

        "$name;$romVersion;$component;$componentversion" | Out-File Server_FW_Report.txt -Append

    }

}
```

```
import-csv Server_FW_Report.txt -delimiter ";" | export-csv Server_FW_Report.csv -NoTypeInformation
remove-item Server_FW_Report.txt -Confirm:$false

Disconnect-HPOVMgmt
```

- Press **CTRL** + **S** to save the script

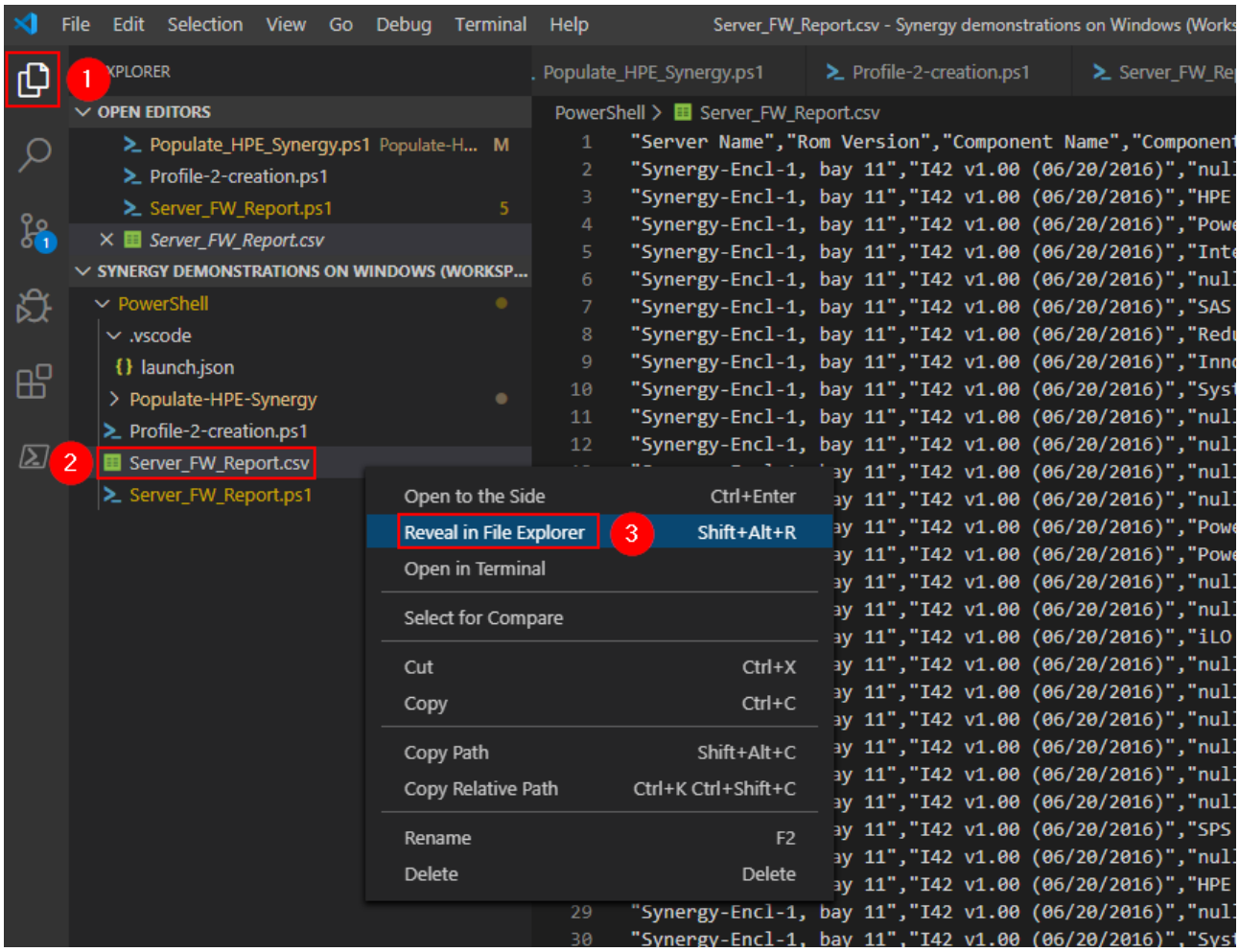


- Then we can run the script by pressing **F5**

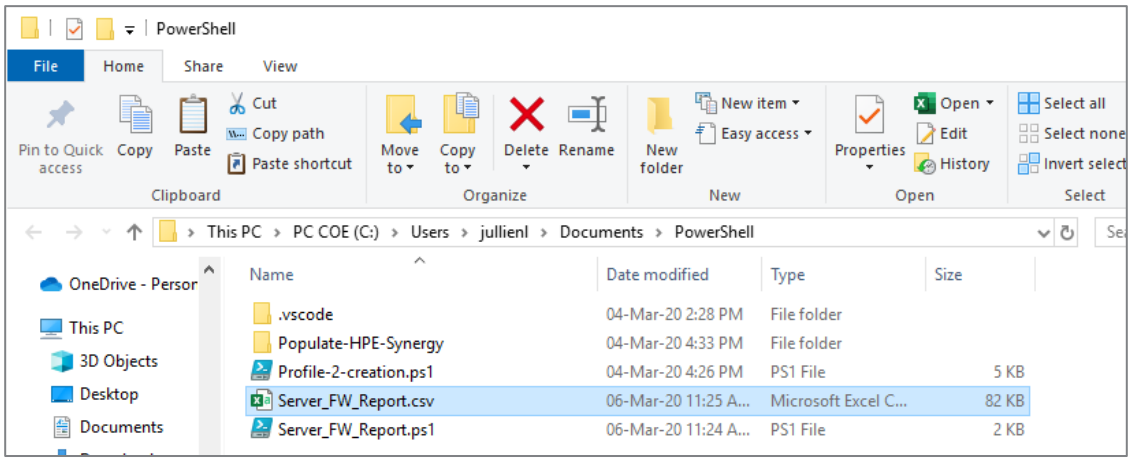


The script generates a CSV file in your working folder

- Go back to the **Explorer**, right-click on the new generated CSV file and select **Reveal in File Explorer**



This will open the Windows explorer



- You can then open the CSV file in Excel to show the generated Synergy Firmware inventory report of all managed compute modules. You might need to re-arrange the columns to get a nice presentation as illustrated below:

A1 | Server Name

	A	B	C	
34	Synergy-Encl-1, bay 11	I42 v1.00 (06/20/2016)	null	2.11.5.13-3.sles15sp0 6.0.0.0-4 15.6.1.3 3.40-3
35	Synergy-Encl-1, bay 11	I42 v1.00 (06/20/2016)	ME SPI Descriptor	1.1 0
36	Synergy-Encl-1, bay 11	I42 v1.00 (06/20/2016)	null	2.11.5.13-3.sles15sp0 6.0.0.0-4 15.6.1.3 3.40-3
37	Synergy-Encl-1, bay 11	I42 v1.00 (06/20/2016)	null	2.11.5.13-3.sles15sp0 6.0.0.0-4 15.6.1.3 3.40-3
38	Synergy-Encl-1, bay 3	I39 v1.30 08/26/2014	Intelligent Provisioning	
39	Synergy-Encl-1, bay 3	I39 v1.30 08/26/2014	HP ProLiant System ROM - Backup	I39 v1.30 08/26/2014
40	Synergy-Encl-1, bay 3	I39 v1.30 08/26/2014	System Programmable Logic Device	Version 0x2F
41	Synergy-Encl-1, bay 3	I39 v1.30 08/26/2014	Intelligent Platform Abstraction Data	
42	Synergy-Encl-1, bay 3	I39 v1.30 08/26/2014	Power Management Controller Firmware	1.0.9
43	Synergy-Encl-1, bay 3	I39 v1.30 08/26/2014	Power Management Controller FW Bootloader	
44	Synergy-Encl-1, bay 3	I39 v1.30 08/26/2014	HPE Synergy 3820C 10/20Gb Converged Network Adapter	
45	Synergy-Encl-1, bay 3	I39 v1.30 08/26/2014	HPE Synergy 3530C 16Gb Fibre Channel Host Bus Adapter	
46	Synergy-Encl-1, bay 3	I39 v1.30 08/26/2014	Server Platform Services (SPS) Firmware	3.0.6.267.1
47	Synergy-Encl-1, bay 3	I39 v1.30 08/26/2014	HP ProLiant System ROM	I39 v1.30 08/26/2014
48	Synergy-Encl-1, bay 3	I39 v1.30 08/26/2014	iLO	2.30 Jul 23 2015
49	Synergy-Encl-1, bay 4	I39 v1.30 08/26/2014	System Programmable Logic Device	Version 0x2F
50	Synergy-Encl-1, bay 4	I39 v1.30 08/26/2014	Power Management Controller Firmware	1.0.9
51	Synergy-Encl-1, bay 4	I39 v1.30 08/26/2014	Power Management Controller FW Bootloader	
52	Synergy-Encl-1, bay 4	I39 v1.30 08/26/2014	HPE Synergy 3820C 10/20Gb Converged Network Adapter	
53	Synergy-Encl-1, bay 4	I39 v1.30 08/26/2014	HPE Synergy 3830C 16G Fibre Channel Host Bus Adapter	
54	Synergy-Encl-1, bay 4	I39 v1.30 08/26/2014	Intelligent Provisioning	
55	Synergy-Encl-1, bay 4	I39 v1.30 08/26/2014	HP ProLiant System ROM	I39 v1.30 08/26/2014
56	Synergy-Encl-1, bay 4	I39 v1.30 08/26/2014	iLO	2.30 Jul 23 2015
57	Synergy-Encl-1, bay 4	I39 v1.30 08/26/2014	Intelligent Platform Abstraction Data	
58	Synergy-Encl-1, bay 4	I39 v1.30 08/26/2014	HP ProLiant System ROM - Backup	I39 v1.30 08/26/2014
59	Synergy-Encl-1, bay 4	I39 v1.30 08/26/2014	Server Platform Services (SPS) Firmware	3.0.6.267.1
60	Synergy-Encl-1, bay 5	I37 v1.30 08/26/2014	Intelligent Provisioning	
61	Synergy-Encl-1, bay 5	I37 v1.30 08/26/2014	iLO	2.30 Jul 23 2015
62	Synergy-Encl-1, bay 5	I37 v1.30 08/26/2014	HPE Synergy 3820C 10/20Gb Converged Network Adapter	
63	Synergy-Encl-1, bay 5	I37 v1.30 08/26/2014	HP ProLiant System ROM - Backup	I39 v1.30 08/26/2014
64	Synergy-Encl-1, bay 5	I37 v1.30 08/26/2014	Power Management Controller FW Bootloader	
65	Synergy-Encl-1, bay 5	I37 v1.30 08/26/2014	HP ProLiant System ROM	I37 v1.30 08/26/2014
66	Synergy-Encl-1, bay 5	I37 v1.30 08/26/2014	System Programmable Logic Device	Version 0x2F
67	Synergy-Encl-1, bay 5	I37 v1.30 08/26/2014	Server Platform Services (SPS) Firmware	3.0.6.267.1
68	Synergy-Encl-1, bay 5	I37 v1.30 08/26/2014	Intelligent Platform Abstraction Data	
69	Synergy-Encl-1, bay 5	I37 v1.30 08/26/2014	Power Management Controller Firmware	1.0.9

Note: This report contains some null component names because we are using a simulated environment.

This concludes PowerShell – Scenario 2

PowerShell – Scenario 3 - Accelerating a configuration change

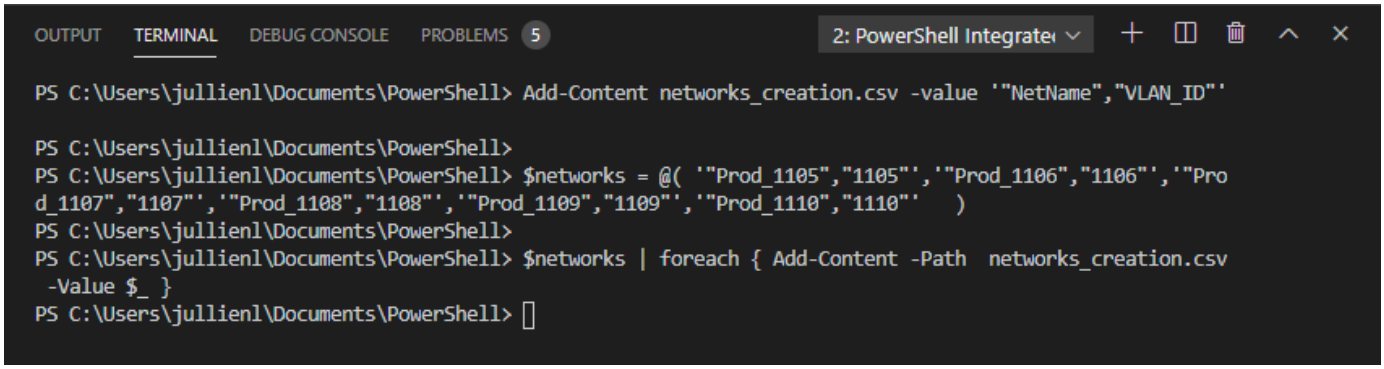
In this scenario, we are going to create new networks in OneView from an Excel spreadsheet (CSV file) and assign all these networks to any of the existing Server Profiles using the network set *Prod*.

Import notice: This scenario can only be run with the Final configuration snapshot (i.e. when a Logical Enclosure is available)

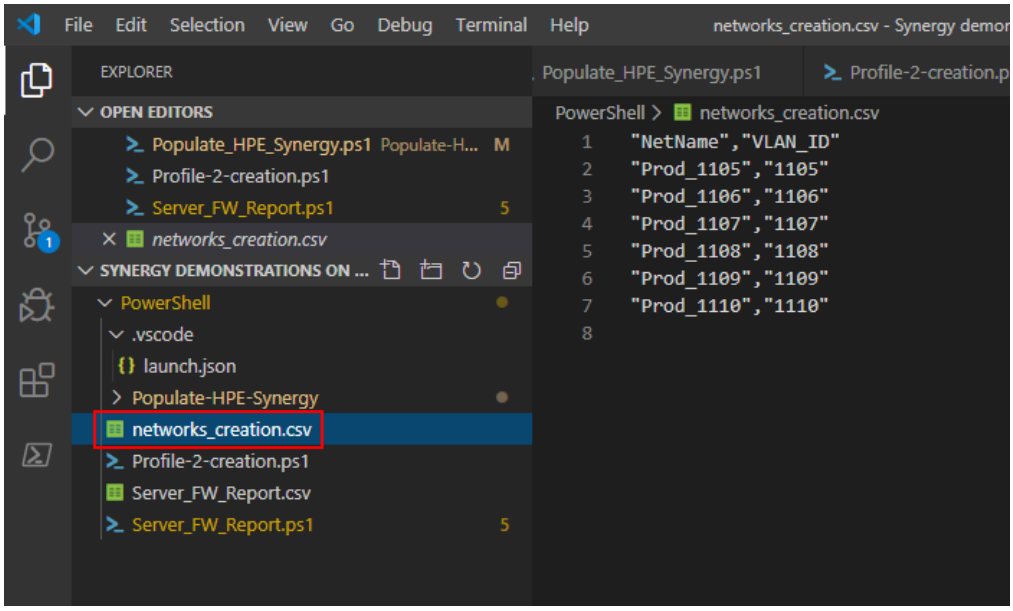
- To easily create the appropriate CSV file to generate the new networks, you can copy the following PowerShell script

```
Add-Content networks_creation.csv -value '"NetName","VLAN_ID"'

$networks = @(
'"Prod_1105","1105"','"Prod_1106","1106"','"Prod_1107","1107"','"Prod_1108","1108"','"Prod_1109","1109"
','"Prod_1110","1110"'    )

$networks | foreach { Add-Content -Path  networks_creation.csv -Value $_ }
```

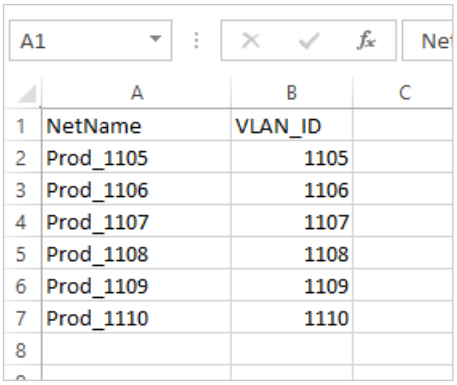
- And paste it in the PowerShell Integrated console:



- This script creates a **networks_creation.csv** in the working directory



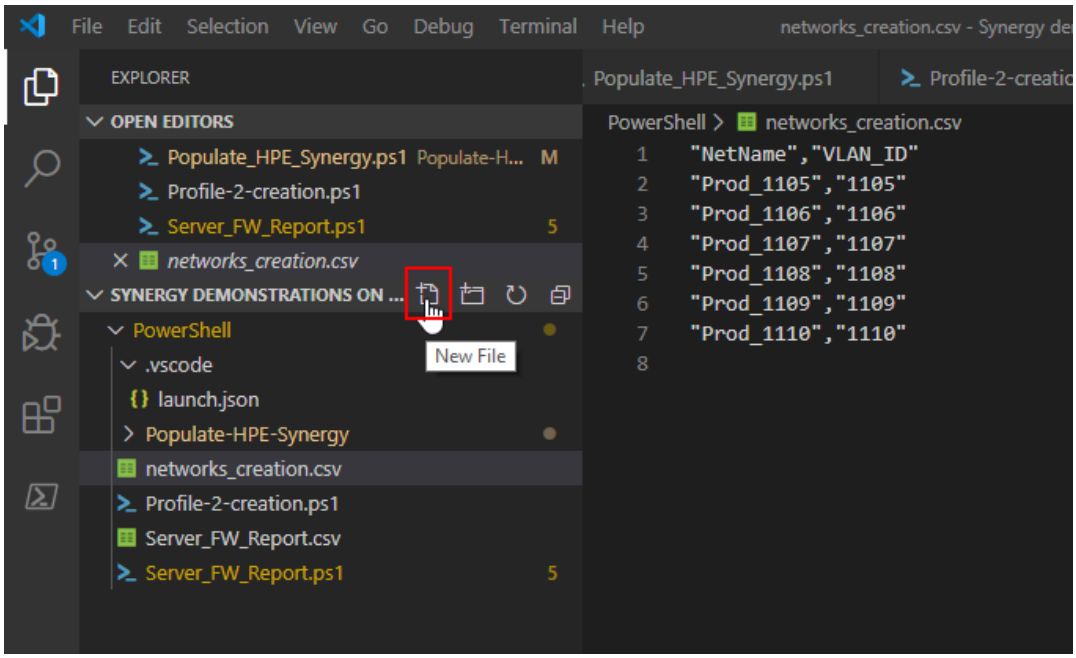
In Excel, it is built as follows:



	A	B	C
1	NetName	VLAN_ID	
2	Prod_1105	1105	
3	Prod_1106	1106	
4	Prod_1107	1107	
5	Prod_1108	1108	
6	Prod_1109	1109	
7	Prod_1110	1110	
8			

This is the spreadsheet that Power Shell will be used to generate six Ethernet Networks **Prod_1105**, **Prod_1106, … Prod_1110** In our Synergy environment.

- Now create a new file in VS Code by pressing **New File**



- Name it **Add_Networks_from_CSV.ps1**
- Copy/paste the following code in this new file:

```
$csvfile = "networks_creation.csv"

$IP = "192.168.56.101"
$username = "Administrator"
$password = "password"

$LIG_UplinkSet = "US-Prod"
$networksetname = "Prod"
$LIGname = "LIG-FlexFabric"

$secpasswd = ConvertTo-SecureString $password -AsPlainText -Force
$credentials = New-Object System.Management.Automation.PSCredential ($username, $secpasswd)
Connect-HPOVMgmt -Hostname $IP -Credential $credentials | Out-Null

$data = (Import-Csv $csvfile)

# Creating Networks and adding them to the LIG uplink Set

$LIG = Get-HPOVLogicalInterconnectgroup -Name $LIGname

if (!(($LIG | Measure-Object).Count -eq 1 )) { Write-Host "Failed to filter down to one LIG" -
ForegroundColor Red | Break }

ForEach ($VLAN In $data) {
```

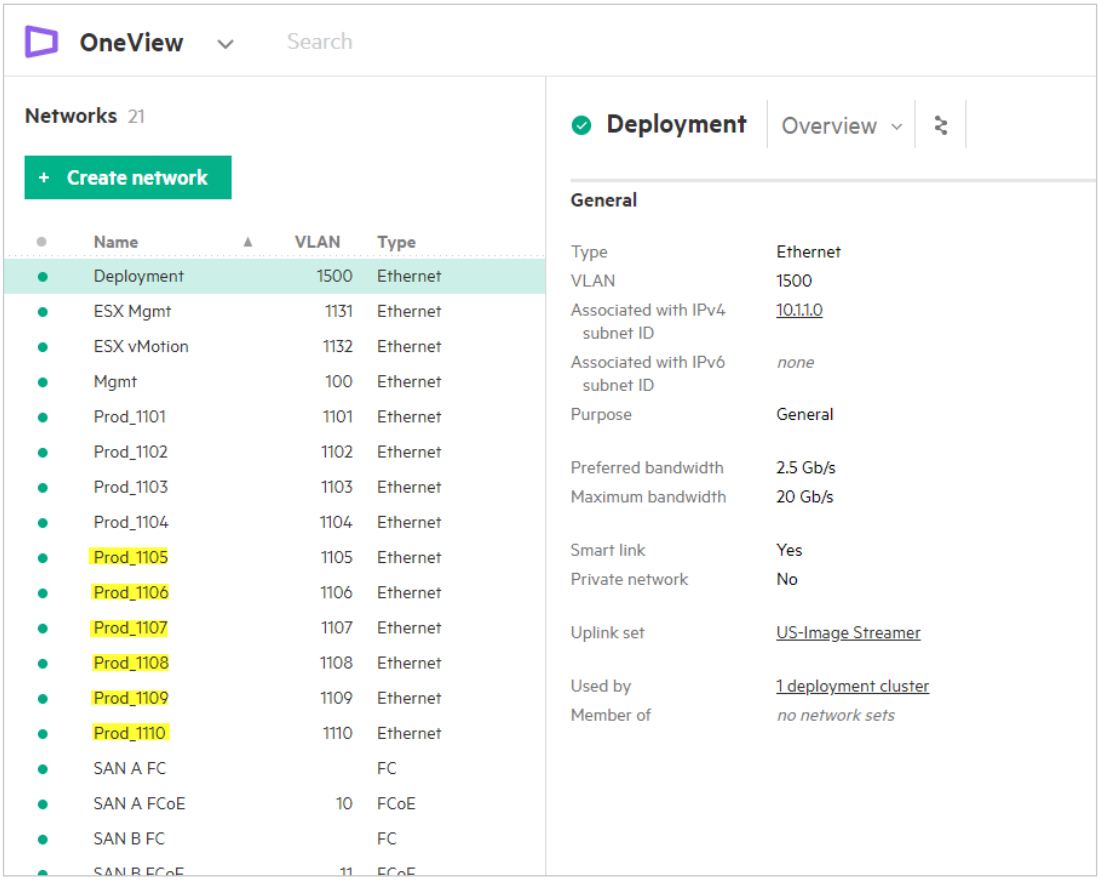
```
    New-HPOVNetwork -Name $VLAN.NetName -Type Ethernet -VLANId $VLAN.VLAN_ID -SmartLink $True | out-
Null
    Write-host "`nCreating Network: " -NoNewline
    Write-host -f Cyan ($VLAN.netName) -NoNewline

    (($LIG.uplinkSets | where-object name -eq $LIG_UplinkSet | Where-Object { $_.ethernetNetworkType -
eq "Tagged" }).networkUris) += (Get-HPOVNetwork -
Name $VLAN.NetName).uri #Add NewNetwork to the networkUris Array
    Write-host "`nAdding Network: " -NoNewline
    Write-host -f Cyan ($VLAN.netName) -NoNewline
    Write-host " to Uplink Set: " -NoNewline
    Write-host -f Cyan $LIG_UplinkSet

}

try {
    Set-HPOVResource $LIG -ErrorAction Stop | Wait-HPOVTaskComplete #| Out-Null
}
catch {
    Write-Output $_ #.Exception
}

# Updating LI from LIG

$LI = ((Get-HPOVLogicalInterconnect) | where-object logicalInterconnectGroupUri -eq $LIG.uri)

do {
    $Interconnectstate = (((Get-HPOVInterconnect) | where-object productname -
match "Virtual Connect") | where-object logicalInterconnectUri -EQ $LI.uri).state

    if ($Interconnectstate -notcontains "Configured") {

        Write-
host "`nWaiting for the running Interconnect configuration task to finish, please wait...`n"
    }

}

until ($Interconnectstate -notcontains "Adding" -and $Interconnectstate -notcontains "Imported" -
and $Interconnectstate -notcontains "Configuring")

Write-host "`nUpdating all Logical Interconnects from the Logical Interconnect Group: " -NoNewline
Write-host -f Cyan $LIG.name
Write-host "`nPlease wait..."

try {
    Get-HPOVLogicalInterconnect -Name $LI.name | Update-HPOVLogicalInterconnect -confirm:$false -
ErrorAction Stop | Wait-HPOVTaskComplete | Out-Null
}
catch {
    Write-Output $_ #.Exception
}

# Adding Network to Network Set

ForEach ($VLAN In $data) {
```

```
    Write-host "`nAdding Network: " -NoNewline
    Write-host -f Cyan ($VLAN.netName) -NoNewline
    Write-host " to NetworkSet: " -NoNewline
    Write-host -f Cyan $networksetname

    $VLANuri = (Get-HPOVNetwork -Name $VLAN.NetName).uri
    $networkset = Get-HPOVNetworkSet -Name $networksetname

    $networkset.networkUris += (Get-HPOVNetwork -Name $VLAN.NetName).uri

    try {
        Set-HPOVNetworkSet $networkset -ErrorAction Stop | Wait-HPOVTaskComplete | Out-Null
    }
    catch {
        Write-Output $_
    }

    if ( (Get-HPOVNetworkSet -Name $NetworkSetname).networkUris -ccontains $VLANuri) {
        Write-host "`nThe network VLAN ID: " -NoNewline
        Write-host -f Cyan $VLAN.NetName -NoNewline
        Write-
host " has been added successfully to all Server Profiles that are using the Network Set: " -NoNewline
        Write-host -f Cyan $networksetname
    }
    else {
        Write-
Warning "`nThe network VLAN ID: $($VLAN.VLAN_ID) has NOT been added successfully, check the status of y
our Logical Interconnect resource`n"
    }

}

$ConnectedSessions | Disconnect-HPOVMgmt | Out-Null
```

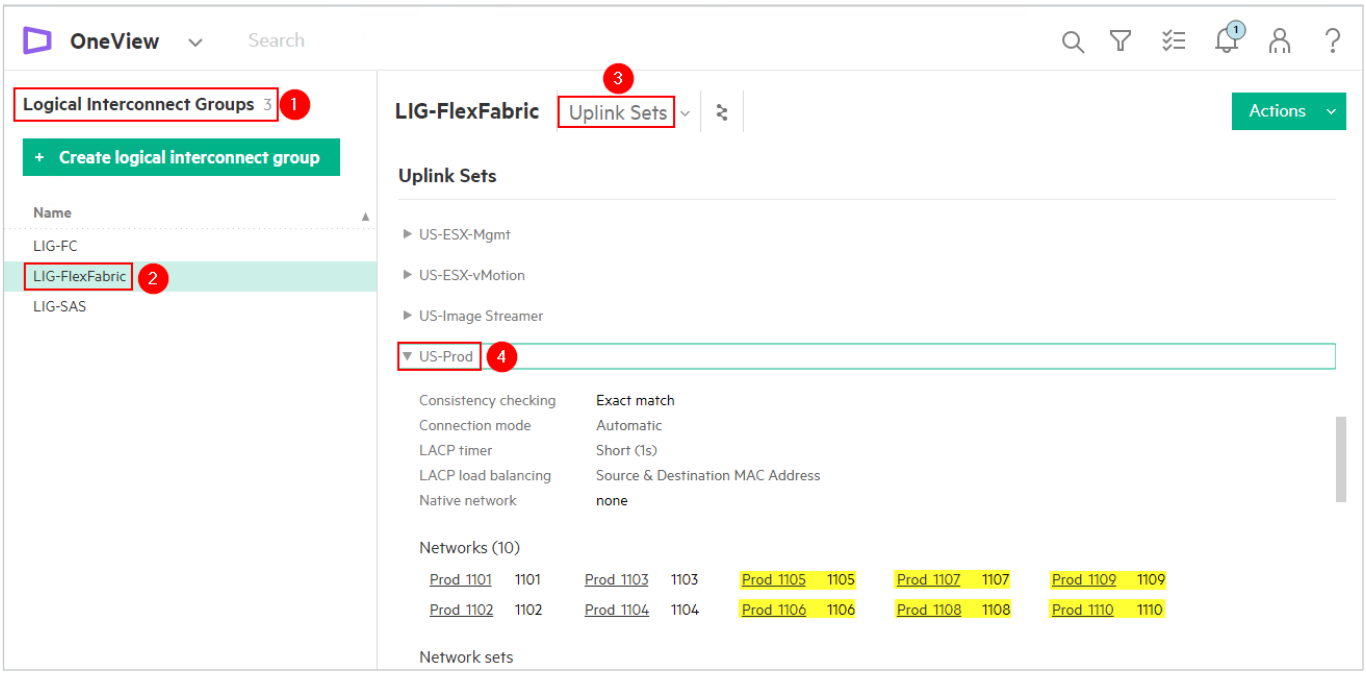
- Save the file by pressing **CTRL** + **S** then press **F5** to run the script
- The first step of the script is the creation of the six networks imported from the CSV file in OneView:

```
Creating Network: Prod_1105
Adding Network: Prod_1105 to Uplink Set: US-Prod

Creating Network: Prod_1106
Adding Network: Prod_1106 to Uplink Set: US-Prod

Creating Network: Prod_1107
Adding Network: Prod_1107 to Uplink Set: US-Prod

Creating Network: Prod_1108
Adding Network: Prod_1108 to Uplink Set: US-Prod

Creating Network: Prod_1109
Adding Network: Prod_1109 to Uplink Set: US-Prod

Creating Network: Prod_1110
Adding Network: Prod_1110 to Uplink Set: US-Prod
```

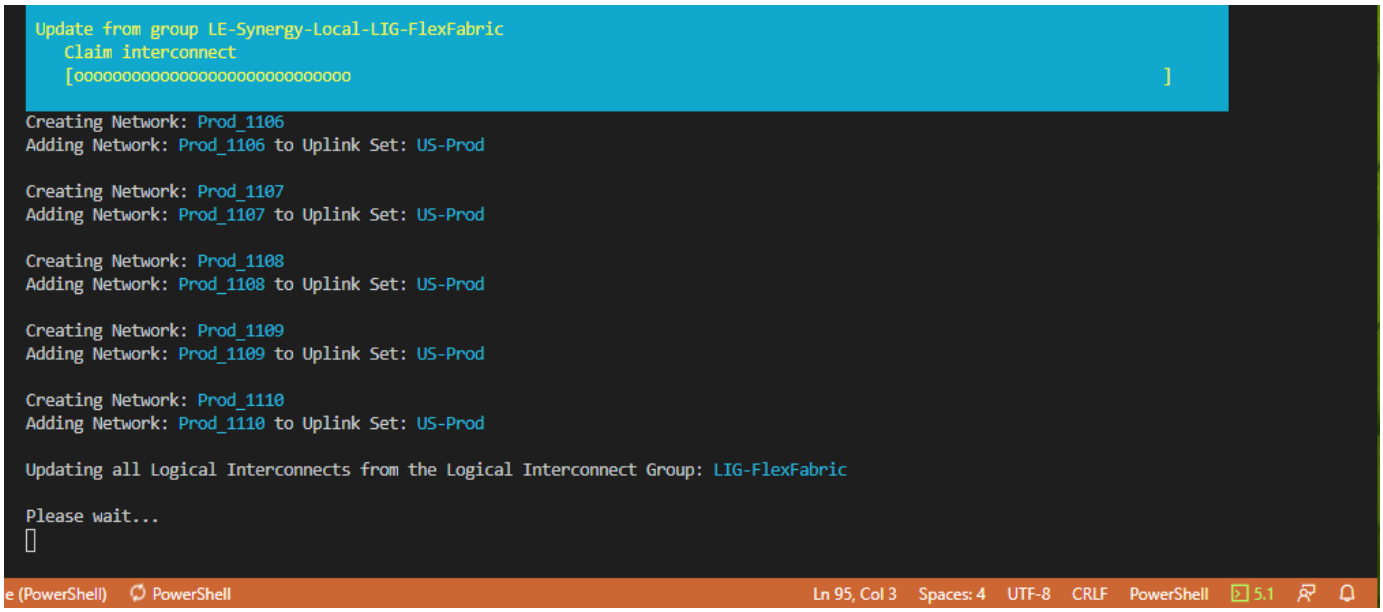
- In OneView **Networks** page, show the progression of the 6 networks creation:



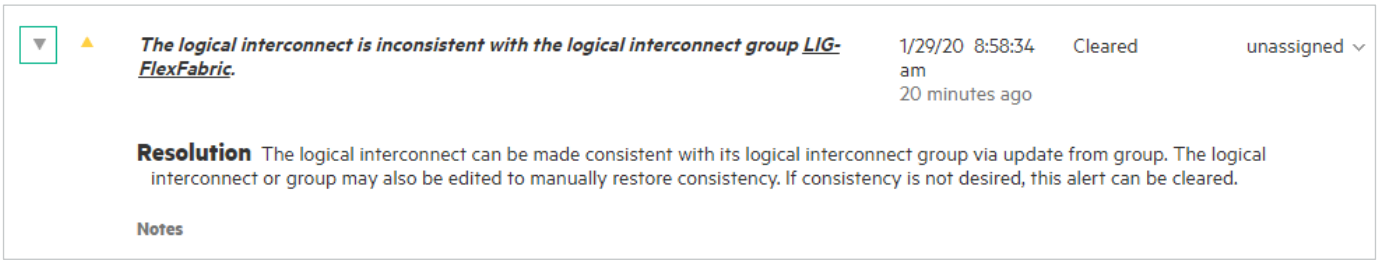
- In the Logical Interconnect Group, show that *LIG-FlexFabric* is now defined with 6 new networks in the *US-Prod* uplink set:



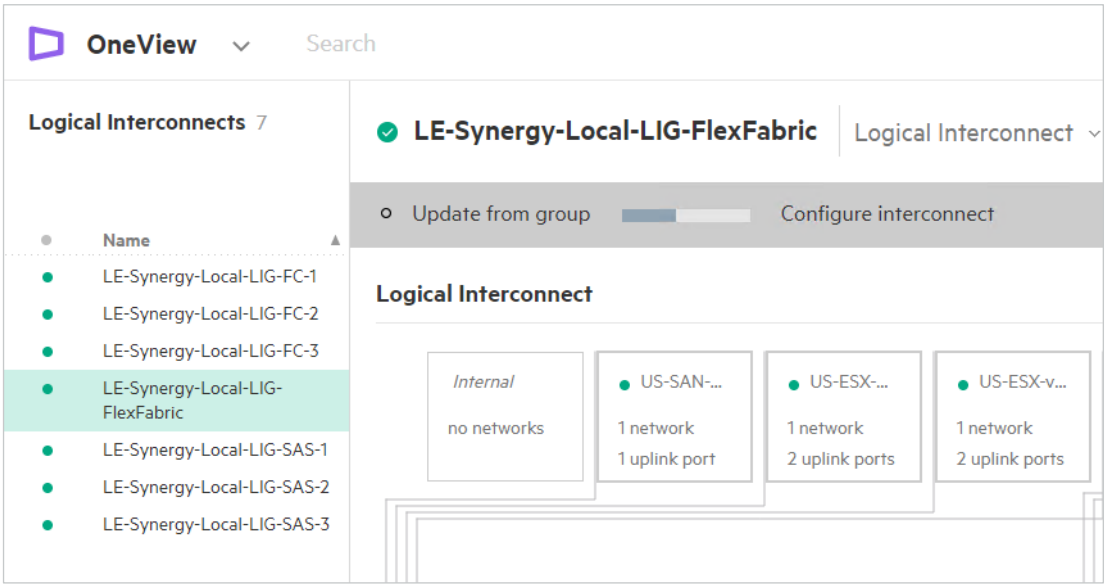
- Back to VS Code, the next step is the update of our Logical Interconnect from its Logical Interconnect Group (LIG-*FlexFabric*):



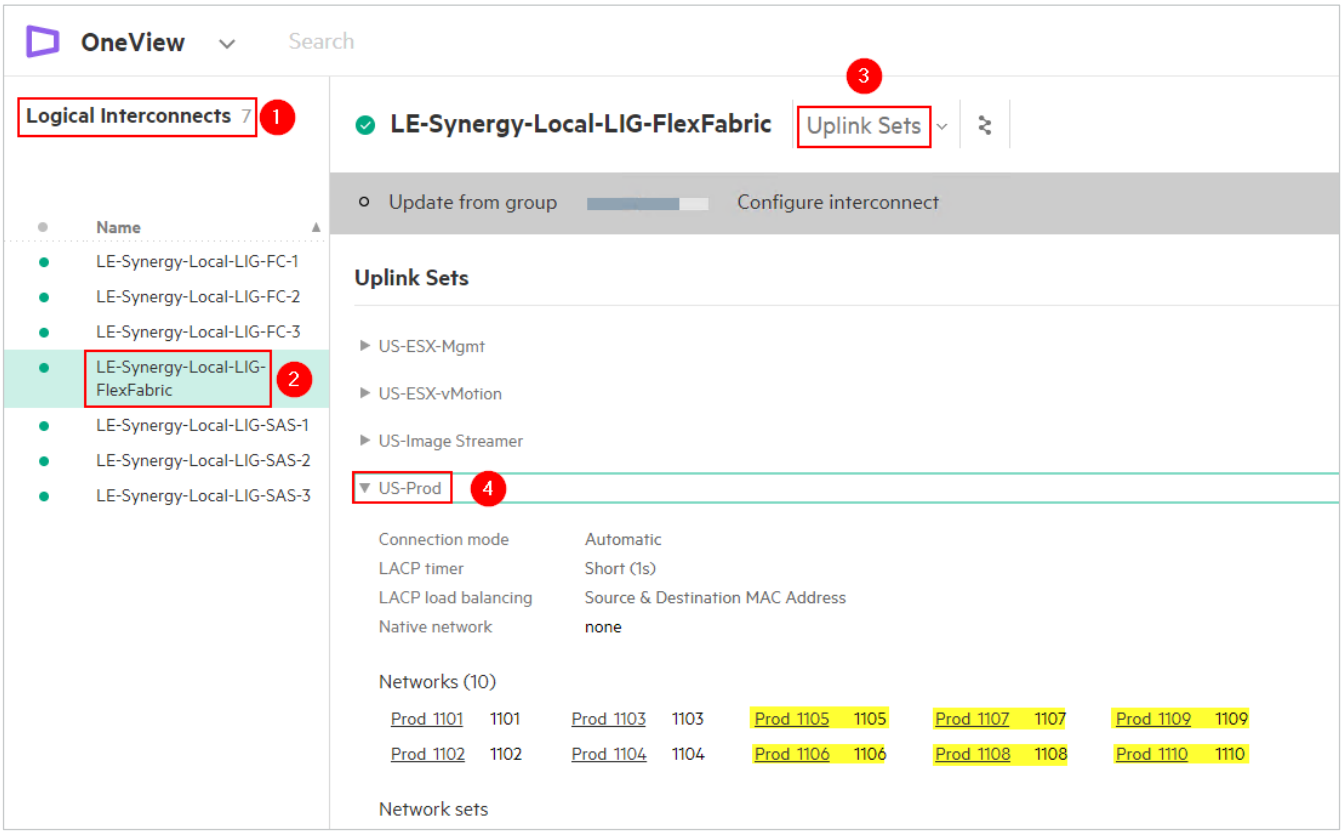
- This step takes some time (4-5mn) so take the opportunity to explain the concept of LI/LIG, show that the LI is inconsistent with the logical Interconnect group (shown in *Activity*):



- After a few minutes, the LI turns Green



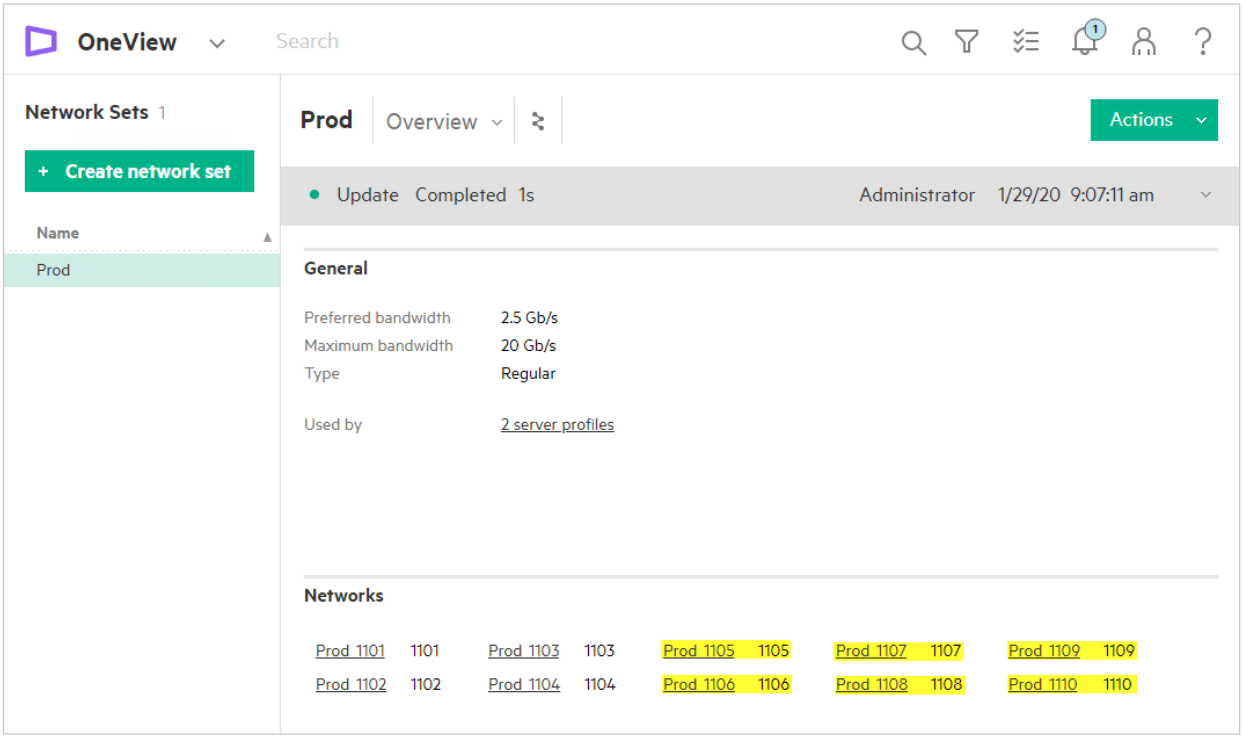
- You can then show the new networks appearing in the *US-Prod* uplink Set:



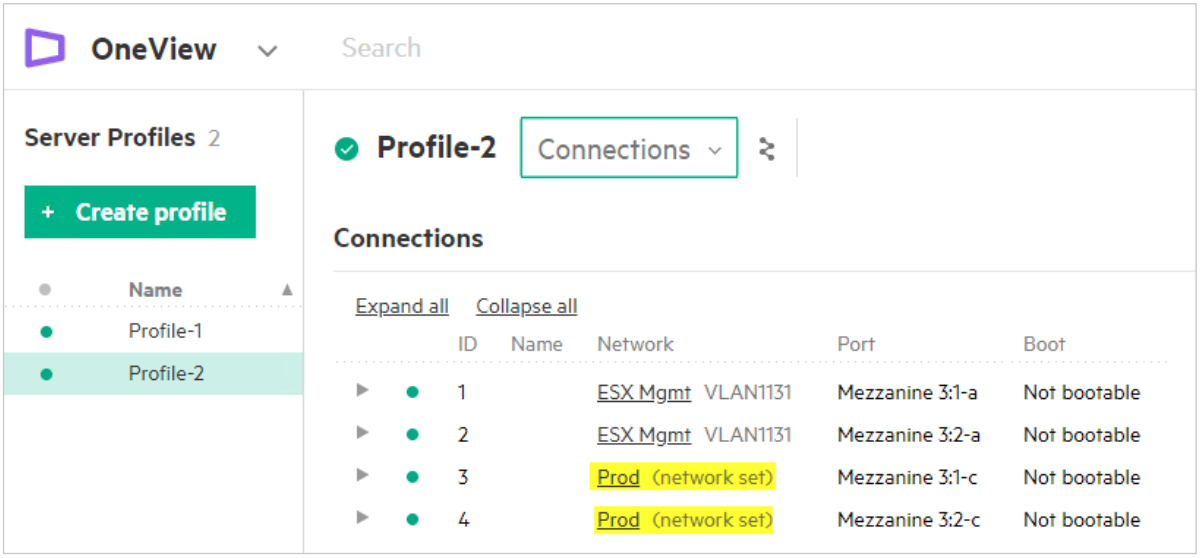
- In the next step, the script is adding the 6 networks to the Network set *Prod*

```
Adding Network: Prod_1105 to NetworkSet: Prod

The network VLAN ID: Prod_1105 has been added successfully to all Server Profiles that are using the Network Set: Prod

Adding Network: Prod_1106 to NetworkSet: Prod

The network VLAN ID: Prod_1106 has been added successfully to all Server Profiles that are using the Network Set: Prod

Adding Network: Prod_1107 to NetworkSet: Prod

The network VLAN ID: Prod_1107 has been added successfully to all Server Profiles that are using the Network Set: Prod

Adding Network: Prod_1108 to NetworkSet: Prod

The network VLAN ID: Prod_1108 has been added successfully to all Server Profiles that are using the Network Set: Prod

Adding Network: Prod_1109 to NetworkSet: Prod

The network VLAN ID: Prod_1109 has been added successfully to all Server Profiles that are using the Network Set: Prod

Adding Network: Prod_1110 to NetworkSet: Prod

The network VLAN ID: Prod_1110 has been added successfully to all Server Profiles that are using the Network Set: Prod
PS C:\Users\Administrator.lj\Documents\DCS Appliance>
```

- You can show in OneView, the additional networks



- Explain the benefits of using network set and show that all networks are now presented to all Server Profiles as Connection 3 and 4 are connected to *Prod* network set:



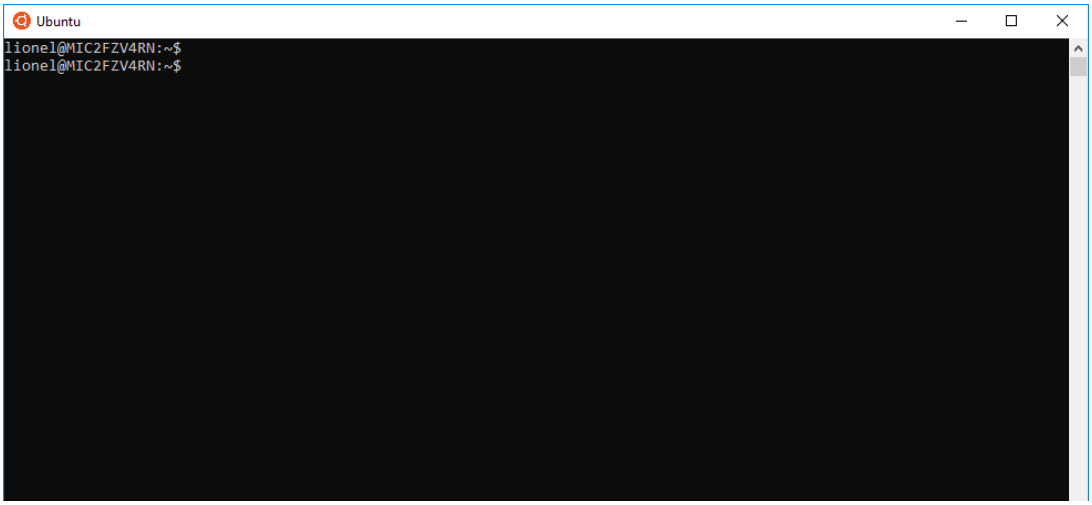
This concludes PowerShell – Scenario 3

Python – Scenario 1 - Day-to-day operation task automation

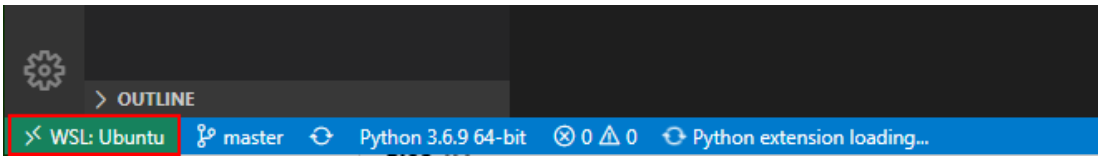
In this scenario, we are going to use Python and the OneView Python library to create a server profile.

Prerequisites:

- Make sure your Ubuntu session running in WSL is started.



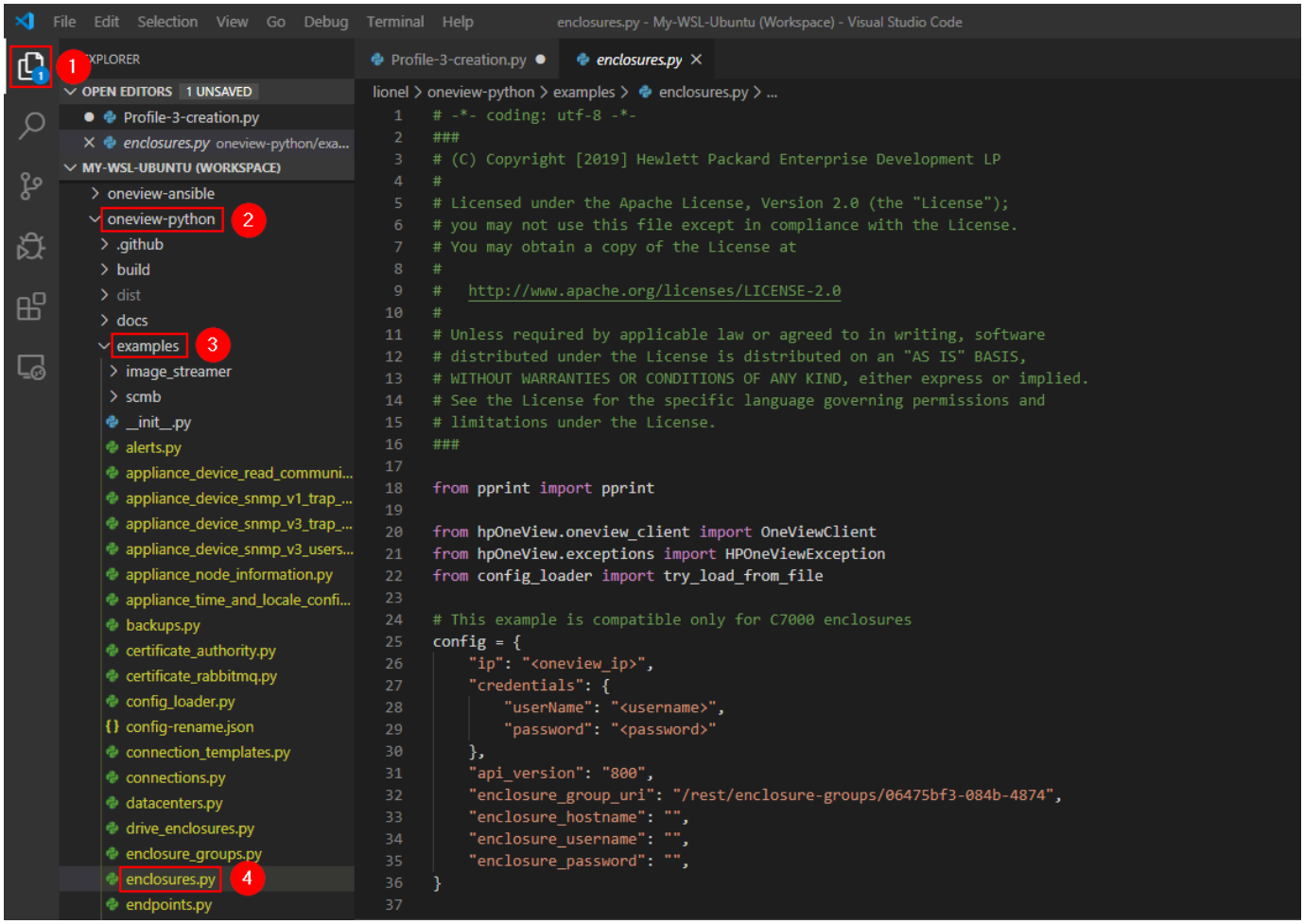
- Open VS Code using **Synergy demonstrations on WSL** workspace, ensure that the Remote WSL extension gets connected by checking the presence of *WSL: Ubuntu* in the status bar in the lower left corner:



- **Import notice**: This scenario can only be run with the Final configuration snapshot (i.e. when a Logical Enclosure is available)

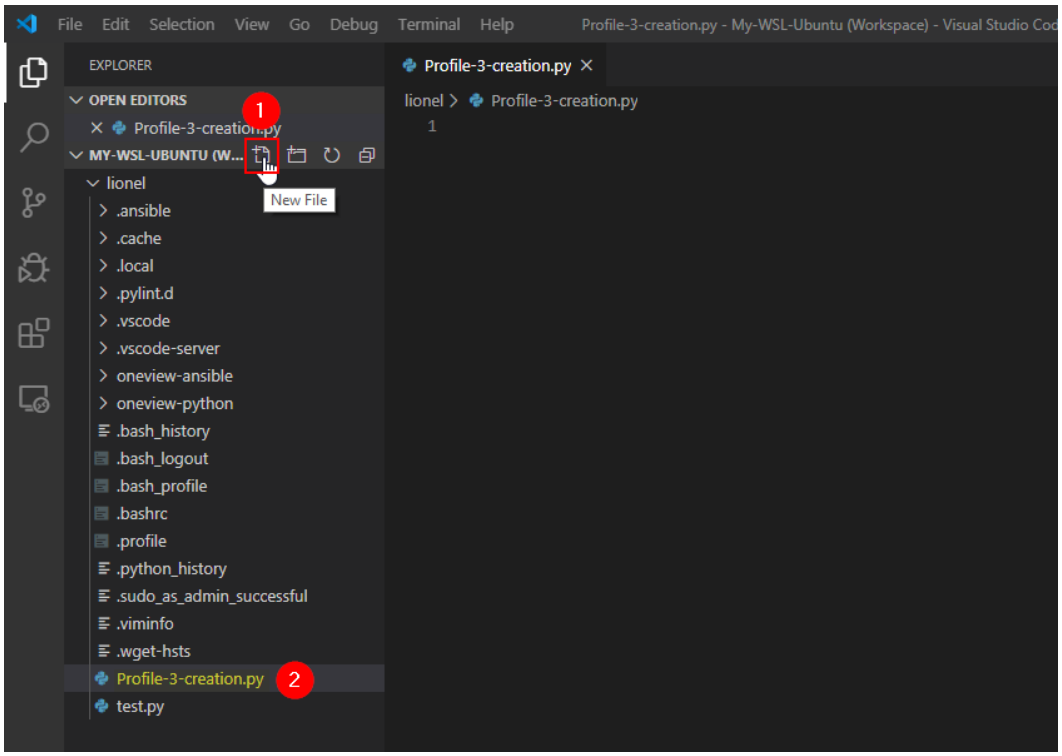
Before creating a server profile, you can show the list of examples provided by the *OneView-Python* library.

- In Explorer, open the **oneview-python** folder and browse the **examples** folder and open **enclosure.py** as an example:



Many examples are provided to help us to create our own Python script.

- Now close the *oneview-python* folder and create in your Ubuntu user home directory a new file, name it **Profile-3-creation.py**



- Then add the following lines to your code:

```
from hpOneView.oneview_client import OneViewClient
from pprint import pprint

config = {
    "ip": "192.168.56.101",
    "api_version": 1200,
    "credentials": {
        "userName": "Administrator",
        "password": "password"
    }
}

oneview_client = OneViewClient(config)

server_hardwares = oneview_client.server_hardware

server_profile_templates = oneview_client.server_profile_templates

myspt = server_profile_templates.get_by_name(
    'HPE Synergy 480 Gen9 with Local Boot for RHEL Template')

server = server_hardwares.get_by_name('Synergy-Encl-3, bay 7')

profile = myspt.get_new_profile()

profile['serverHardwareUri'] = server.data['uri']

profile['name'] = 'Profile-3'

oneview_client.server_profiles.create(profile)

server_profiles = oneview_client.server_profiles

configuration = {
    "powerState": "On",
    "powerControl": "MomentaryPress"
}
server_power = server.update_power_state(configuration)
```

A few explanations:

- Import the HPOneView module with:

```
from hpOneView.oneview_client import OneViewClient
```

- Import the pprint function as well, we'll use it later to make output more readable

```
from pprint import pprint
```

- Provide the OneView information and credentials:

```
config = {
      "ip": "192.168.56.101",
      "api_version": 1200,
      "credentials": {
            "userName": "Administrator",
            "password": "password"
      }
}
```

- Make the connection with the appliance:

```
oneview_client = OneViewClient(config)
```

- Get the server hardware information for later use:

```
server_hardwares = oneview_client.server_hardware
```

- Get the server profile template information for later use:

```
server_profile_templates = oneview_client.server_profile_templates
```

- Pull the information of our Server Profile Template from *server_profile_templates*:

```
myspt = server_profile_templates.get_by_name(
     'HPE Synergy 480 Gen9 with Local Boot for RHEL Template')
```

- Pull the information of Server 'Synergy-Encl-3, bay 7' from *server_profile_templates*:

```
server = server_hardwares.get_by_name('Synergy-Encl-3, bay 7')
```

- Generate a new profile from our Server Profile Template:

```
profile = myspt.get_new_profile()
```

- Modify the 'serverHardwareUri' property of the generated profile object with the value of the selected server hardware uri:

```
profile['serverHardwareUri'] = server.data['uri']
```

- Set the server profile name:

```
profile['name'] = 'Profile-3'
```

- Create a new profile from our Server Profile Template:

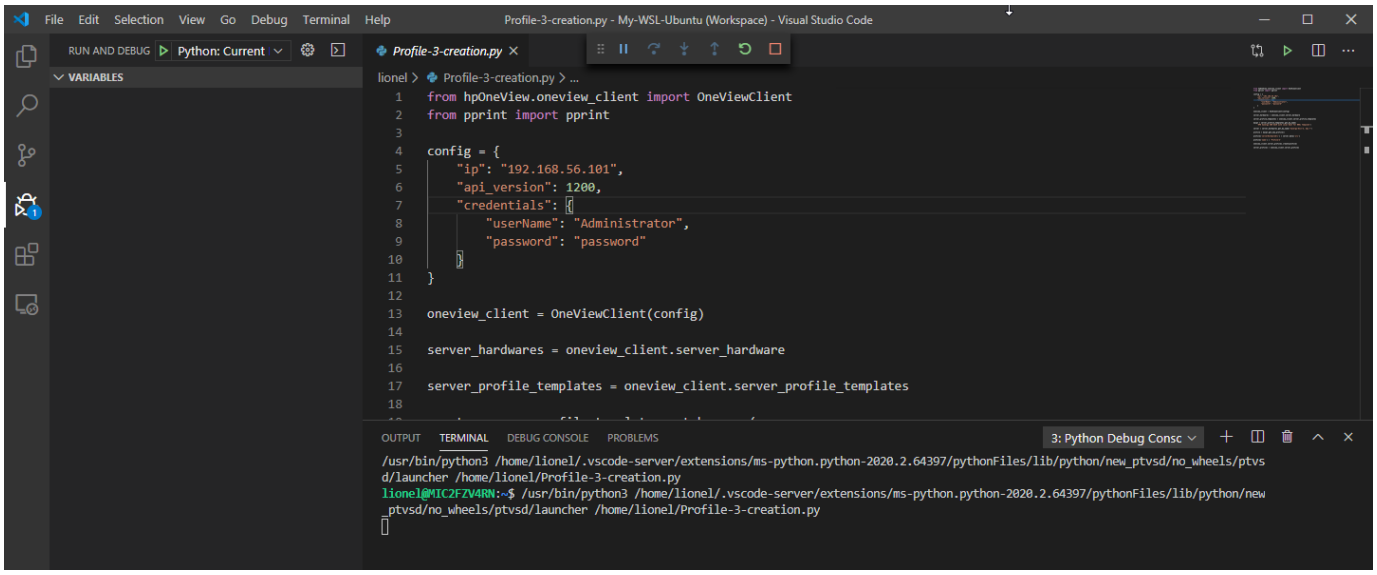
```
oneview_client.server_profiles.create(profile)
```

- Turn the server on:

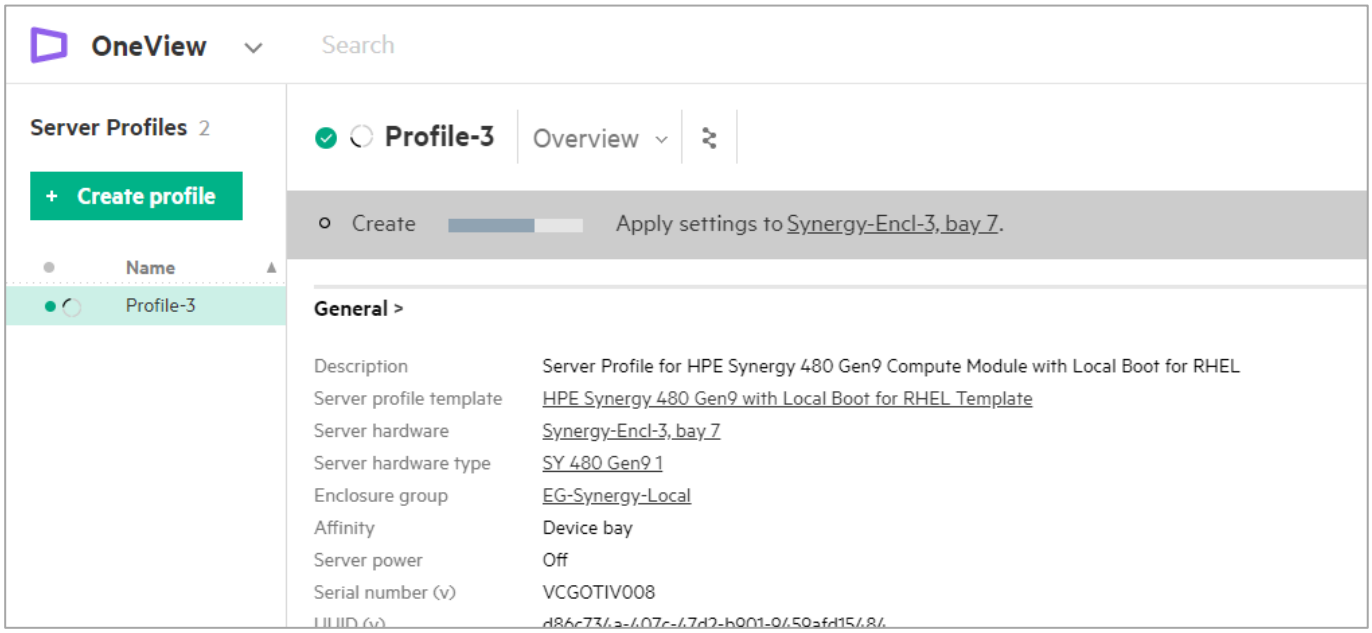
```
configuration = {
    "powerState": "On",
    "powerControl": "MomentaryPress"
}
server_power = server.update_power_state(configuration)
```

- Save now the script, press **CTRL** + **S**.

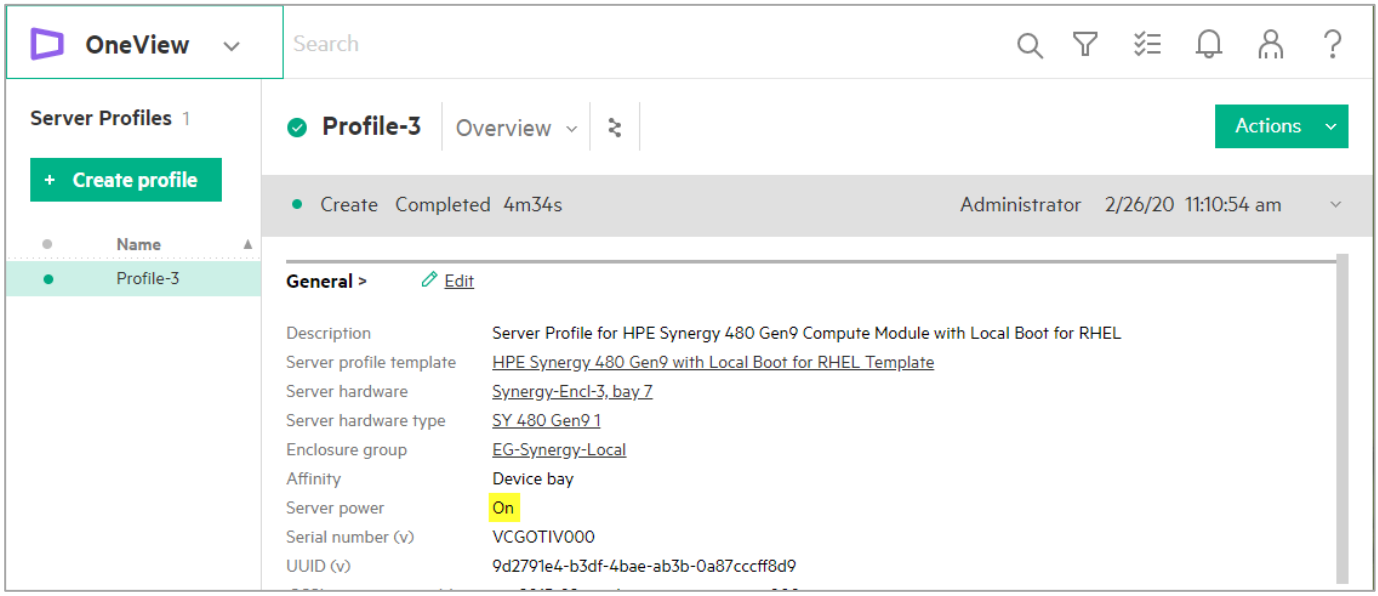
- Then to run the script, press **F5**.



- Simultaneously, you can open the web address https://192.168.56.101/#/profiles to show the creation of the new server profile:



- Once created, the server is turned on:



This concludes Python – Scenario 1

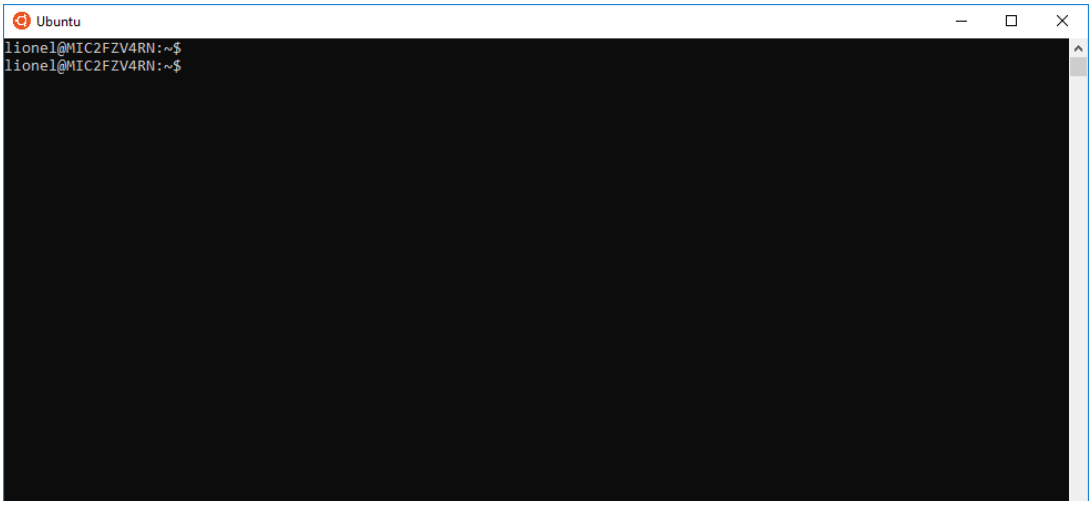
Python – Scenario 2 – Creating a report

In this scenario, we are going to demonstrate how to generate a Synergy FW inventory report of all managed compute modules using the following output format:

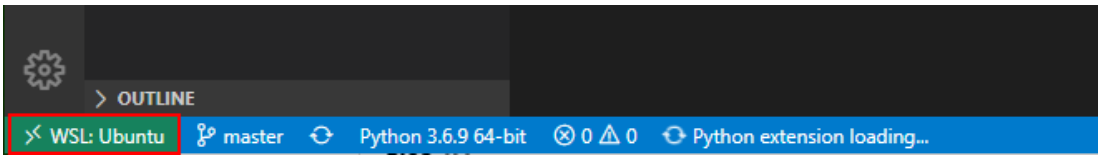
Server Name	Rom Version	Model	iLO Address
Synergy-Encl-3, bay 5	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.19
Synergy-Encl-3, bay 8	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.22
Synergy-Encl-3, bay 7	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.21
Synergy-Encl-1, bay 7	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.6

Prerequisites:

- Make sure your Ubuntu session running in WSL is started.

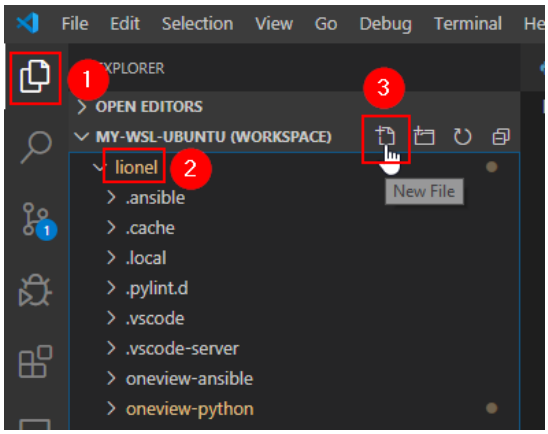


- Open VS Code using **Synergy demonstrations on WSL** workspace, ensure that the Remote WSL extension gets connected by checking the presence of *WSL: Ubuntu* in the status bar in the lower left corner:



- **Notice**: This scenario can be run with either the initial or final configuration snapshot.

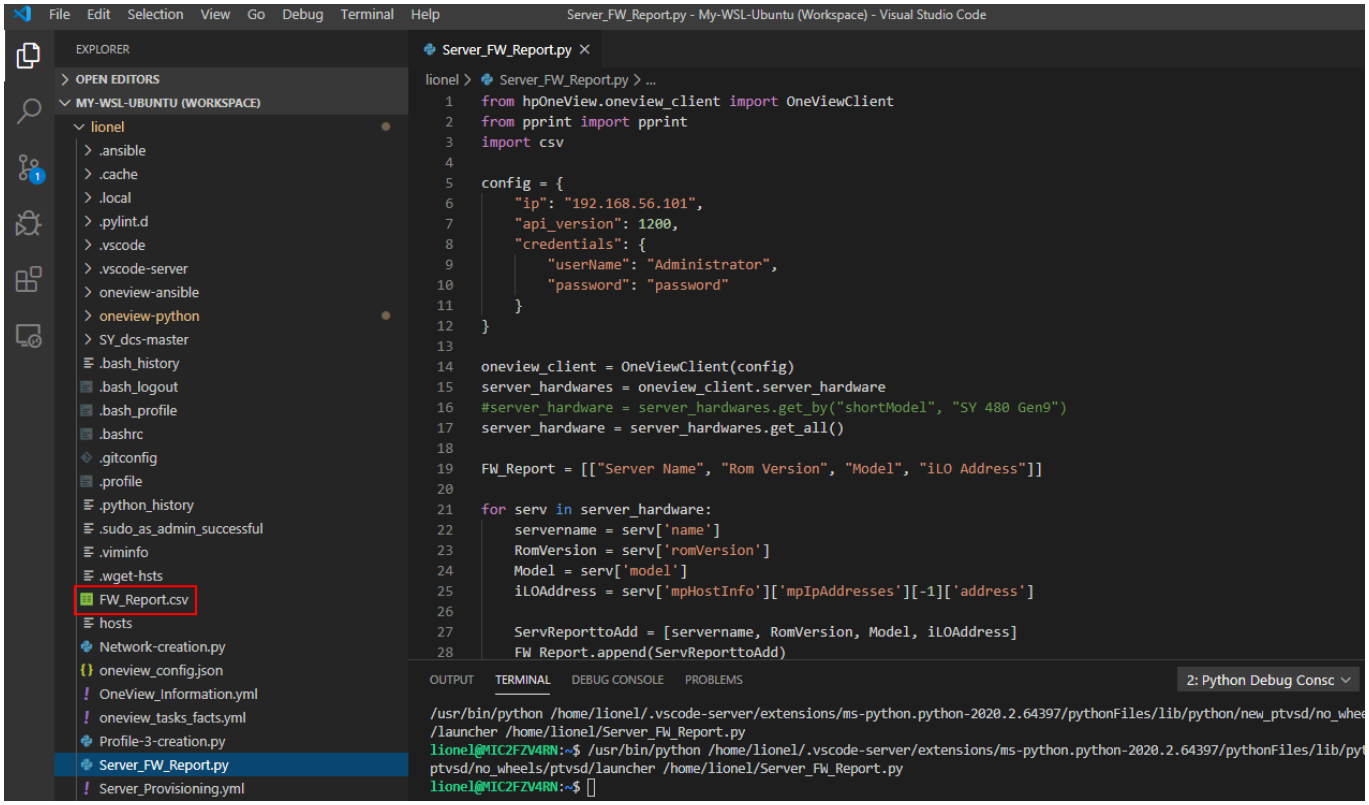
- Create a new file in VS Code in your user home directory, name it **Server_FW_Report.py**



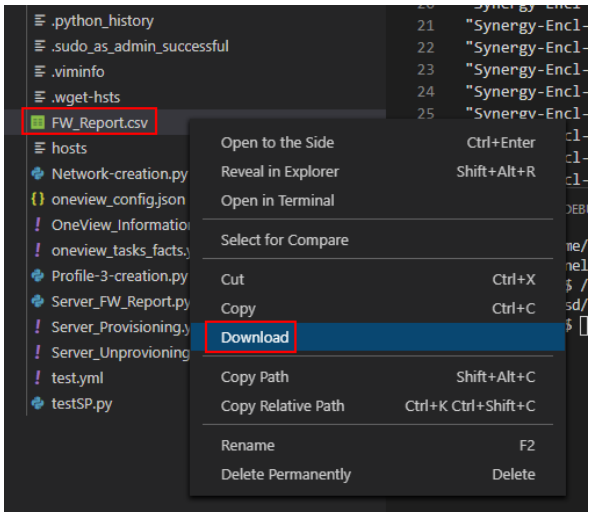
- Then add the following lines to your script:

```
from hpOneView.oneview_client import OneViewClient
from pprint import pprint
import csv

config = {
    "ip": "192.168.56.101",
    "api_version": 1200,
    "credentials": {
        "userName": "Administrator",
        "password": "password"
    }
}

oneview_client = OneViewClient(config)
server_hardwares = oneview_client.server_hardware
server_hardware_gen9 = server_hardwares.get_by("shortModel", "SY 480 Gen9")

FW_Report = [["Server Name", "Rom Version", "Model", "iLO Address"]]

for serv in server_hardware_gen9:
    servername = serv['name']
    RomVersion = serv['romVersion']
    Model = serv['model']
    iLOAddress = serv['mpHostInfo']['mpIpAddresses'][-1]['address']

    ServReporttoAdd = [servername, RomVersion, Model, iLOAddress]
    FW_Report.append(ServReporttoAdd)

with open('FW_Report.csv', 'wb') as file:
    writer = csv.writer(file)
    writer.writerows(FW_Report)
```

- Then save the script by pressing **CTRL** + **S**, then **F5** to run the script.
- Once run, you should find the **FW_Report.csv** file in your user home directory:



- Right-click the file and select **Download**



- Then open the file with Excel from your downloaded folder:

	A	B	C	D	E
1	Server Name	Rom Version	Model	iLO Address	
2	Synergy-Encl-3, bay 4	I39 v1.30 08/26/2014	HPE Synergy 660 Gen9 Compute Module	172.18.6.18	
3	Synergy-Encl-3, bay 3	I39 v1.30 08/26/2014	HPE Synergy 660 Gen9 Compute Module	172.18.6.17	
4	Synergy-Encl-3, bay 5	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.19	
5	Synergy-Encl-3, bay 8	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.22	
6	Synergy-Encl-3, bay 7	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.21	
7	Synergy-Encl-3, bay 6	I43 v1.00 (06/20/2016)	Synergy 660 Gen10	172.18.31.6	
8	Synergy-Encl-3, bay 11	I42 v1.00 (06/20/2016)	Synergy 480 Gen10	172.18.31.5	
9	Synergy-Encl-1, bay 3	I39 v1.30 08/26/2014	HPE Synergy 660 Gen9 Compute Module	172.18.6.4	
10	Synergy-Encl-1, bay 7	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.6	
11	Synergy-Encl-1, bay 4	I39 v1.30 08/26/2014	HPE Synergy 660 Gen9 Compute Module	172.18.6.5	
12	Synergy-Encl-1, bay 8	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.7	
13	Synergy-Encl-1, bay 5	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.2	
14	Synergy-Encl-1, bay 6	I43 v1.00 (06/20/2016)	Synergy 660 Gen10	172.18.31.2	
15	Synergy-Encl-1, bay 11	I42 v1.00 (06/20/2016)	Synergy 480 Gen10	172.18.31.1	
16	Synergy-Encl-2, bay 3	I39 v1.30 08/26/2014	HPE Synergy 660 Gen9 Compute Module	172.18.6.10	
17	Synergy-Encl-2, bay 4	I39 v1.30 08/26/2014	HPE Synergy 660 Gen9 Compute Module	172.18.6.11	
18	Synergy-Encl-2, bay 5	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.12	
19	Synergy-Encl-2, bay 6	I43 v1.00 (06/20/2016)	Synergy 660 Gen10	172.18.31.4	
20	Synergy-Encl-2, bay 7	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.14	
21	Synergy-Encl-2, bay 11	I42 v1.00 (06/20/2016)	Synergy 480 Gen10	172.18.31.3	
22	Synergy-Encl-2, bay 8	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.15	
23	Synergy-Encl-5, bay 3	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.42	
24	Synergy-Encl-5, bay 4	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.43	
25	Synergy-Encl-5, bay 9	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.38	
26	Synergy-Encl-5, bay 5	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.44	
27	Synergy-Encl-5, bay 6	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.45	
28	Synergy-Encl-5, bay 12	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.41	
29	Synergy-Encl-5, bay 11	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.40	
30	Synergy-Encl-5, bay 10	I37 v1.30 08/26/2014	HPE Synergy 480 Gen9 Compute Module	172.18.6.39	
31	Synergy-Encl-4, bay 2	I39 v1.30 08/26/2014	HPE Synergy 660 Gen9 Compute Module	172.18.6.26	

FW_Report

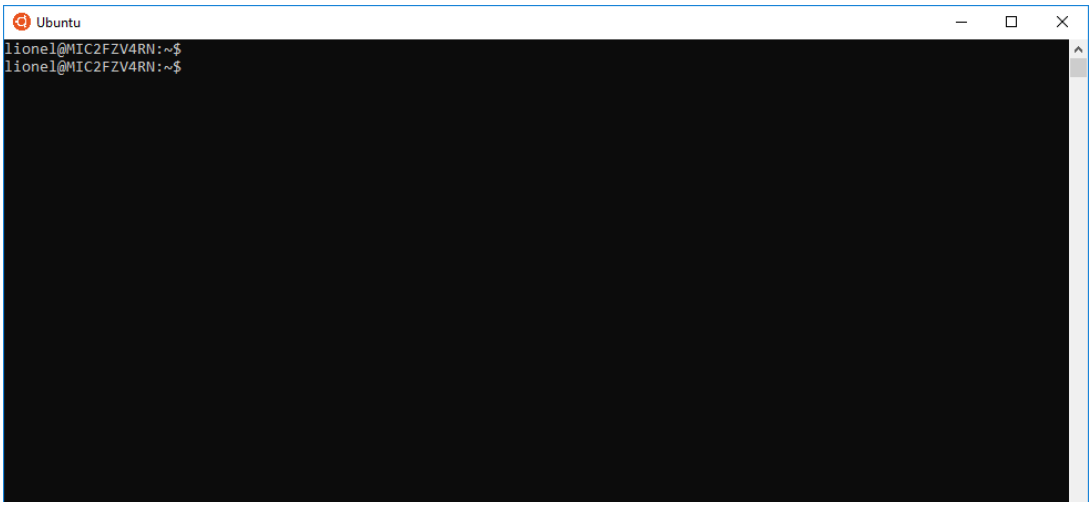
This concludes Python – Scenario 2

Python – Scenario 3 - Accelerating a configuration change

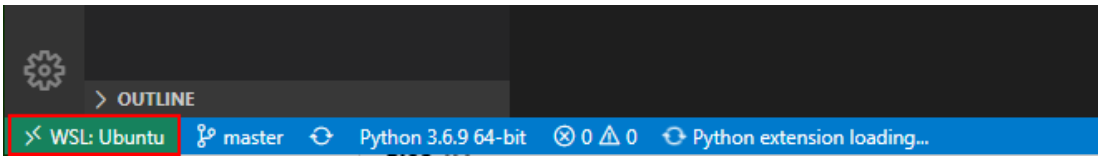
In this scenario, we are going to use Python to create a new network in OneView (Name: *RHEL Prod*, VLANID: *50*), then add this network to the uplink set *US-Prod* and to the network set *Prod* so that any of the existing Server Profiles using the network set *Prod* will be automatically connected to this new network.

Prerequisites:

- Make sure your Ubuntu session running in WSL is started.

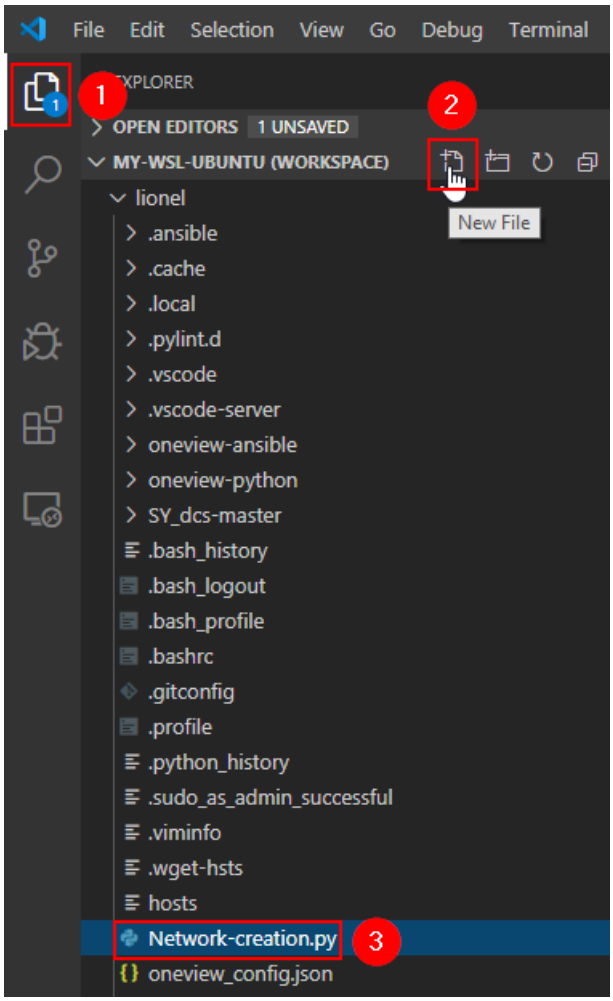


- Open VS Code using **Synergy demonstrations on WSL** workspace, ensure that the Remote WSL extension gets connected by checking the presence of *WSL: Ubuntu* in the status bar in the lower left corner:



- **Import notice**: This scenario can only be run with the Final configuration snapshot (i.e. when a Logical Enclosure is available)

- In VS Code, go to the **Explorer** to create in your user home directory a new file, name it **Network-creation.py**

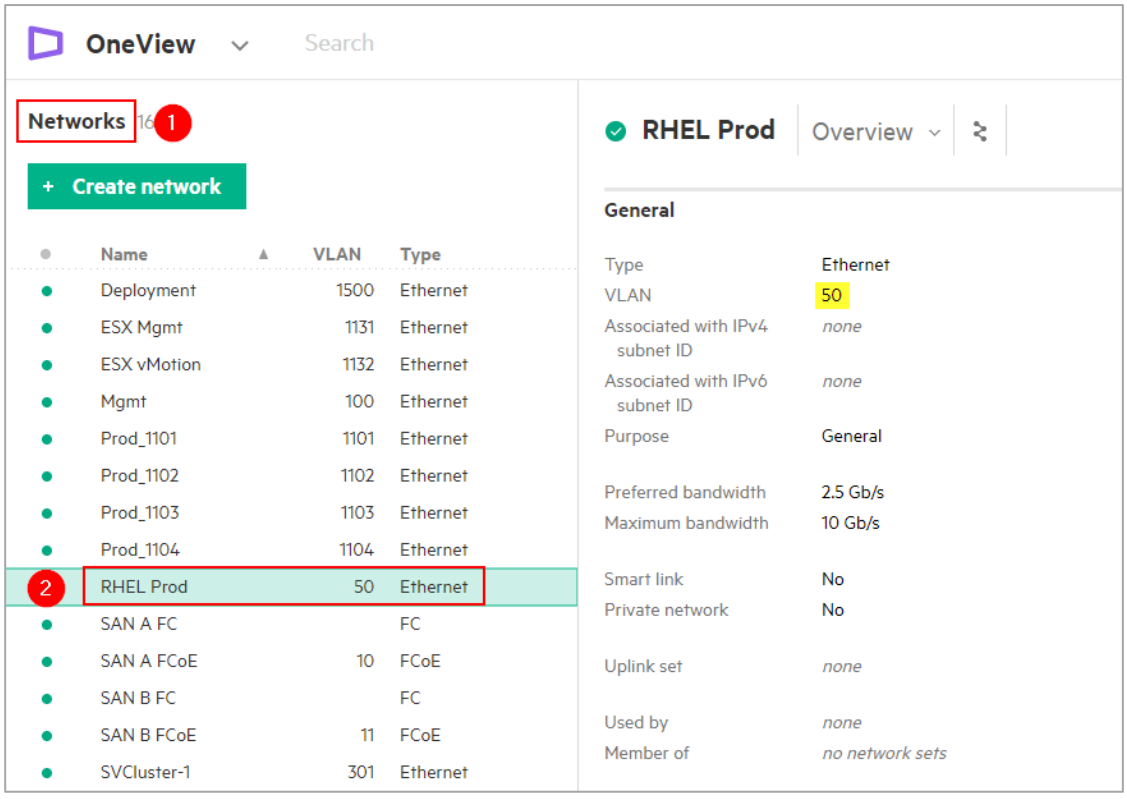


- Then add the following lines to your script:

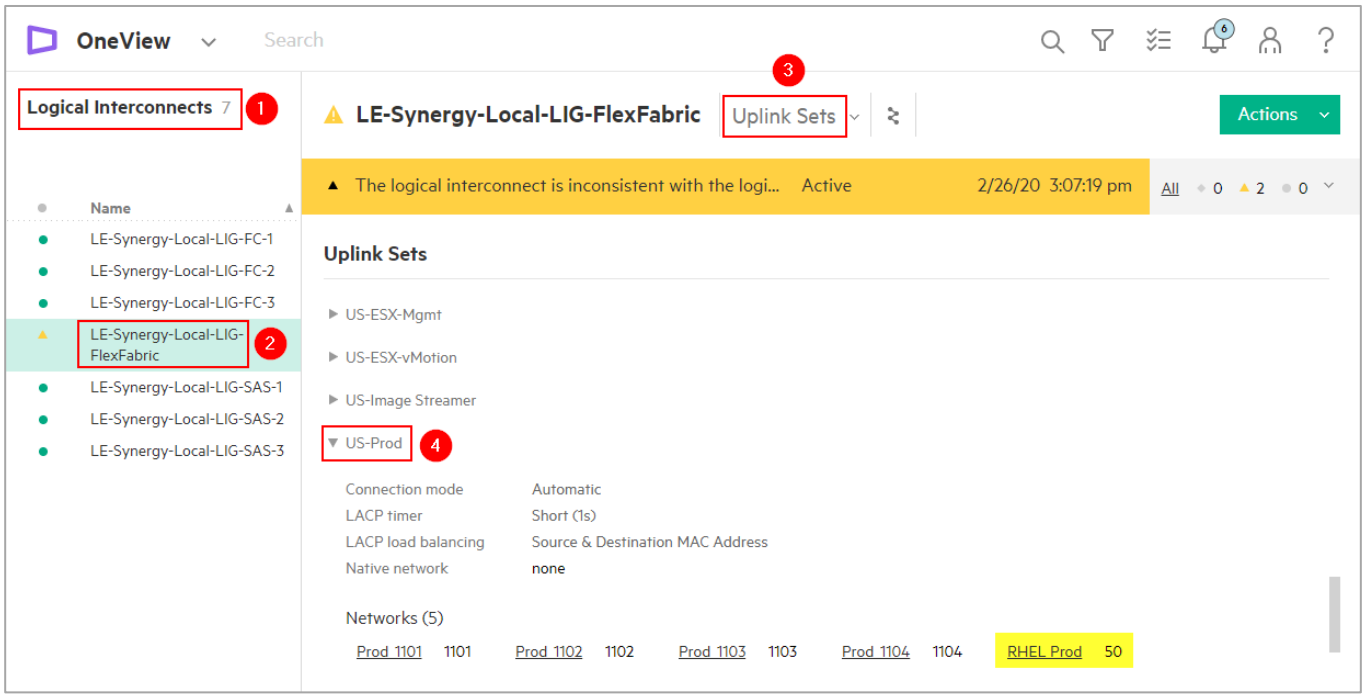
```
from hpOneView.oneview_client import OneViewClient
from pprint import pprint

config = {
    "ip": "192.168.56.101",
    "api_version": 1200,
    "credentials": {
        "userName": "Administrator",
        "password": "password"
    }
}

oneview_client = OneViewClient(config)

ethernet_networks = oneview_client.ethernet_networks
network_sets = oneview_client.network_sets

# Creating Ethernet network

options_ethernet = {
    "name": "RHEL Prod",
    "vlanId": 50,
    "ethernetNetworkType": "Tagged",
    "purpose": "General",
    "smartLink": False,
    "privateNetwork": False,
    "connectionTemplateUri": None,
}

ethernet_network = ethernet_networks.create(options_ethernet)

print("Created ethernet-networks successfully.\n  uri = '%s' " %
      (ethernet_network.data['uri']))

# Adding network to Logical Interconnect Uplink Set

uplink_sets = oneview_client.uplink_sets

logical_interconnect_uri = oneview_client.logical_interconnects.get_all()[
    0]['uri']

ethernet_network_uri = ethernet_network.data['uri']

ethernet_network_name = options_ethernet['name']

uplink_set = uplink_sets.get_by_name("US-Prod")

uplink_added_ethernet = uplink_set.add_ethernet_networks(
    ethernet_network_name)

print("The uplink set with name = '{name}' have now the networks:\n {networkUris}".format(
    **uplink_added_ethernet))

# Adding new network to Network Set
```

```
network_set = network_sets.get_by_name("Prod")

networkset_networkUris = (network_set.data)['networkUris']

new_networkset_networkUris = networkset_networkUris + [ethernet_network_uri]

network_set_update = {'networkUris': new_networkset_networkUris}

network_set = network_set.update(network_set_update)

print("Updated network set '%s' successfully.\n" %
      (network_set.data['name']))
```

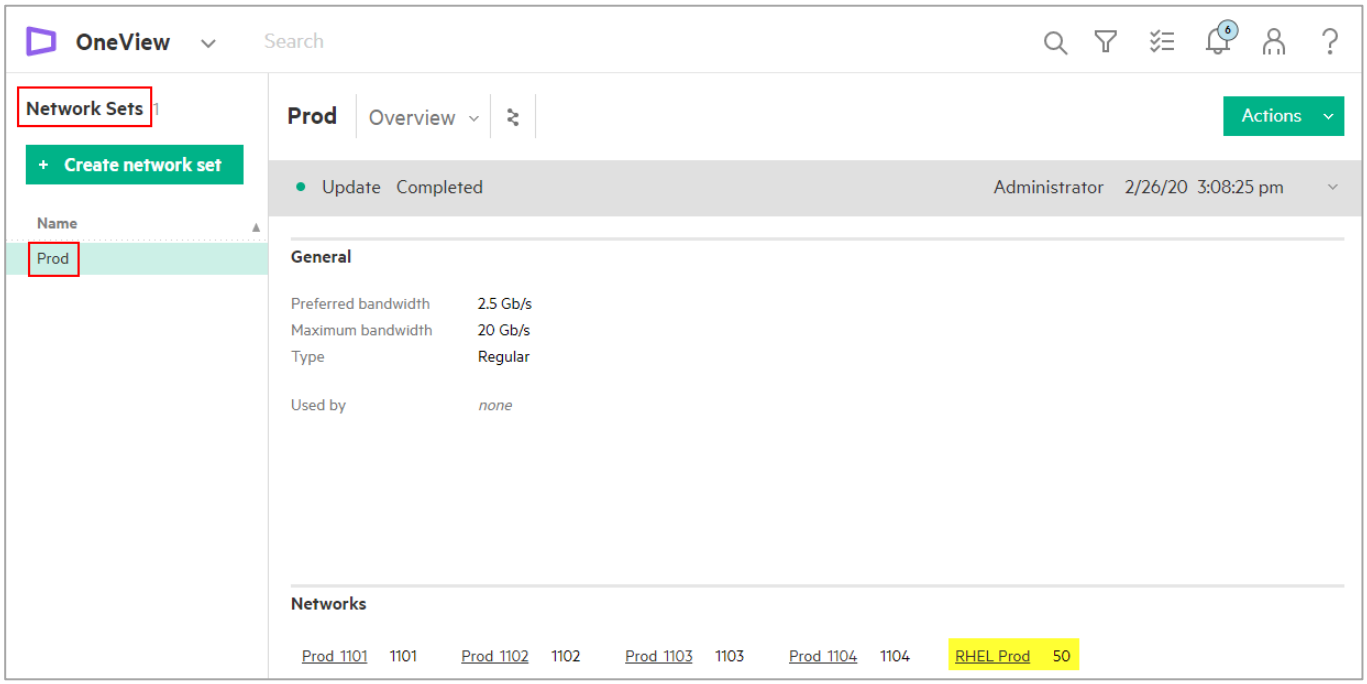
- Then save the script by pressing **CTRL** + **S**, then **F5** to run the script.
- Simultaneously, you can open the OneView web interface to show the script progress, open the **Networks** page to show the new **RHEL Prod** network:



- Then open **Logical Interconnects** page, select the FlexFabric LIG then go to the **Uplink Sets** sections to show the new **RHEL Prod** network in the **US-Prod** uplink set:



- And finally, browse the **Network Set** page to show that **RHEL Prod** network has been added:



- In the console, the following is displayed:

```
lionel@MIC2FZV4RN:~$ env PTVSD_LAUNCHER_PORT=52062 /usr/bin/python3 /home/lionel/.vscode-server/extensions/ms-python.python-2020.2.64
397/pythonFiles/lib/python/new_ptvsd/no_wheels/ptvsd/launcher /home/lionel/testSP.py
Created ethernet-networks successfully.
  uri = '/rest/ethernet-networks/f04b7bee-6287-4325-b5e1-b8a23e3f0143'
The uplink set with name = 'US-Prod' have now the networks:
 ['/rest/ethernet-networks/51f797ed-5748-4bd7-bae7-81d827c200c6', '/rest/ethernet-networks/2d9fd879-db86-41c8-b292-9384c8f4de42', '/r
est/ethernet-networks/f04b7bee-6287-4325-b5e1-b8a23e3f0143', '/rest/ethernet-networks/f8603383-5e3a-4d61-bc0c-29d98317658e', '/rest/e
thernet-networks/314c5174-129e-4326-b239-0ba3de253b08']
Updated network set 'Prod' successfully.

lionel@MIC2FZV4RN:~$
```

The benefit of using network sets in Server Profile is that now *RHEL Prod* is now presented to all Server Profiles using the *Prod* network set.

This concludes Python – Scenario 3

Ansible – Scenario 1 – Collecting facts in OneView

Hewlett Packard Enterprise has teamed up with several industry-leading configuration management providers, including Ansible by Red Hat®. The Ansible tool gives developers fast, scalable, and flexible automation of application configuration, deployment, and orchestration.

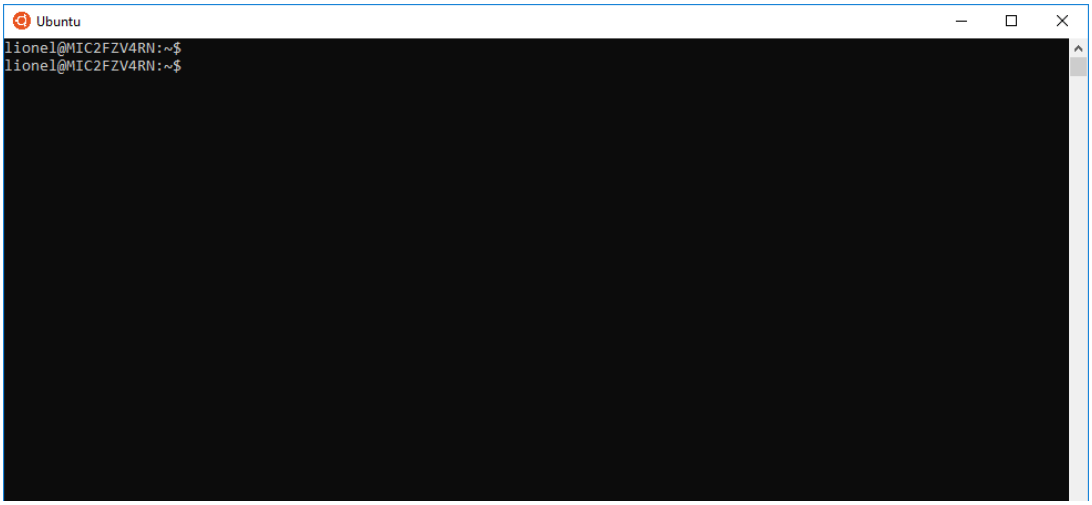
The integration of Ansible with HPE OneView extends the ability to automate the provisioning of bare-metal resources, including servers, storage, and networking. This accelerates time to value through automated, consistent provisioning.

Note: To learn more about Ansible with HPE OneView, see Accelerating DevOps with HPE OneView and Ansible

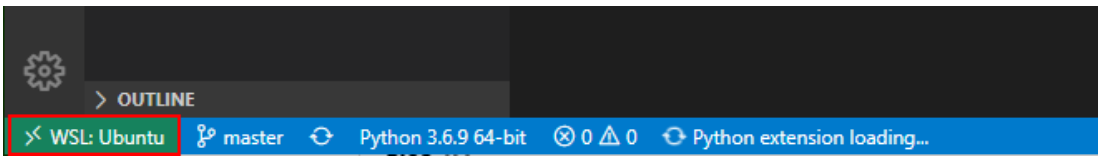
In this scenario, we are going to use Ansible to collect some information from our Synergy Composer DCS appliance.

Prerequisites:

- Make sure your Ubuntu session running in WSL is started.

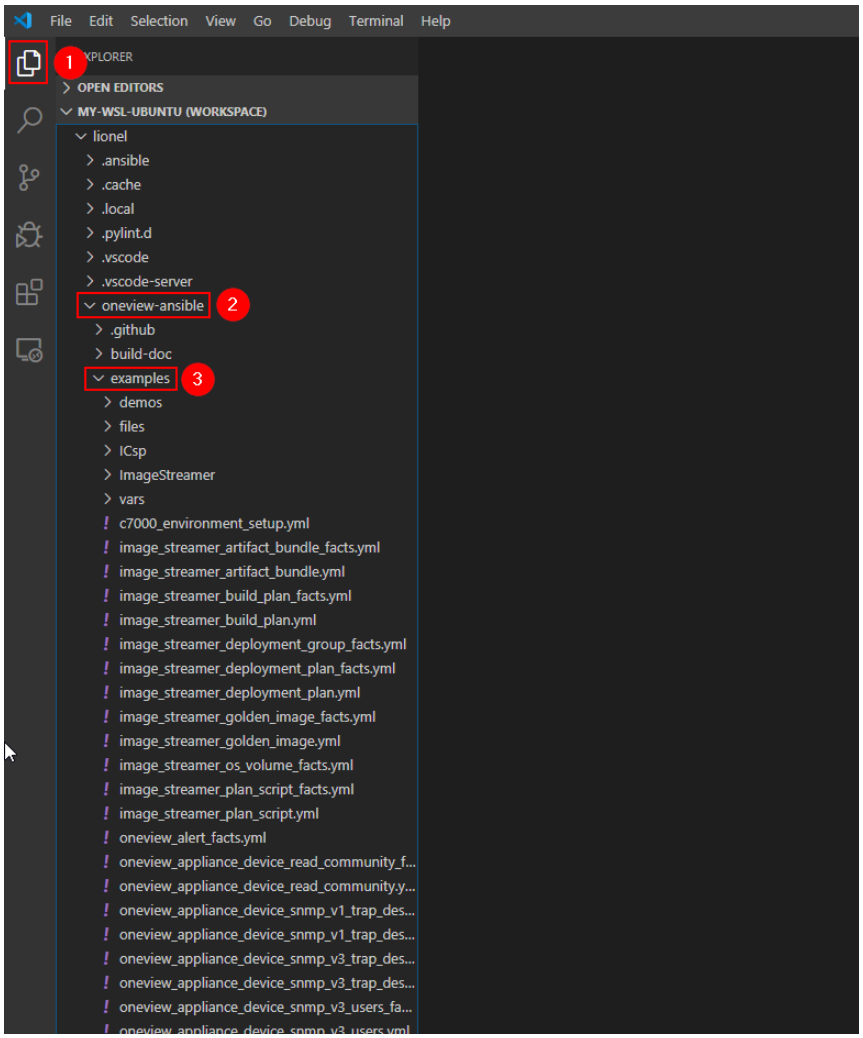


- Open VS Code using **Synergy demonstrations on WSL** workspace, ensure that the Remote WSL extension gets connected by checking the presence of *WSL: Ubuntu* in the status bar in the lower left corner:



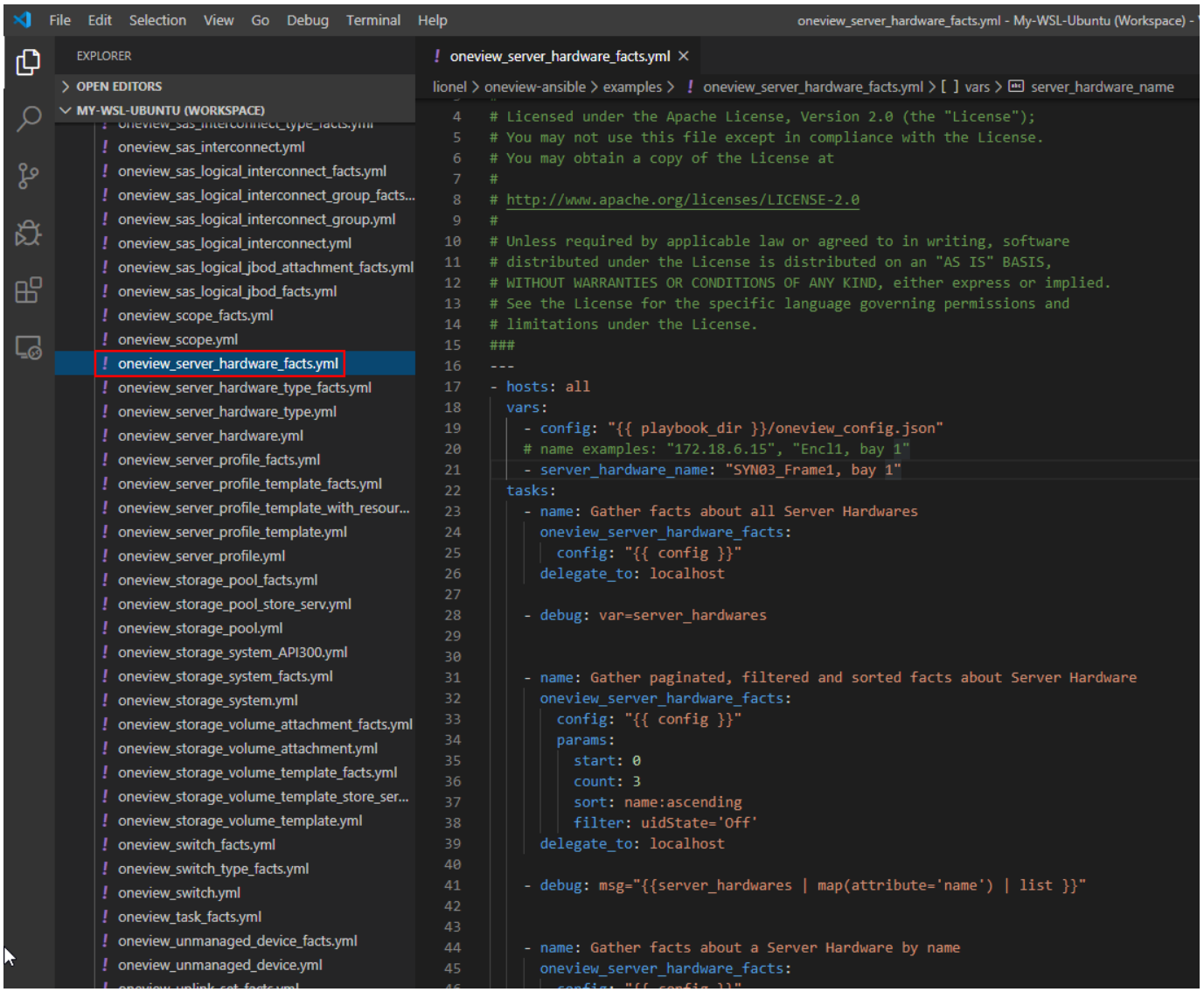
- **Notice**: This scenario can be run with either the initial or final configuration snapshot.

- In Explorer, open the **oneview-ansible** folder and browse the **examples** folder:

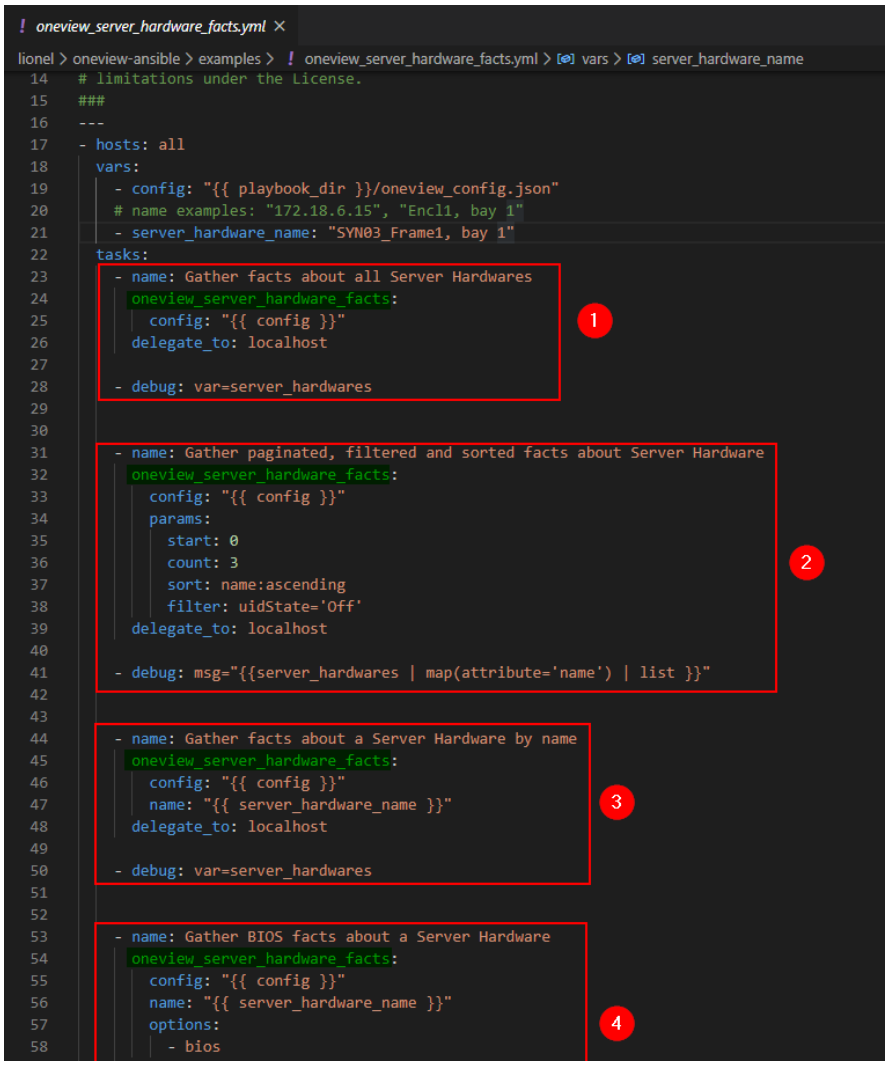


A long list of examples is provided by the *HPE OneView-Ansible* library. Each OneView resource operation is exposed through an Ansible module.

- Open **oneview_server_hardware_facts.yml** as an example:



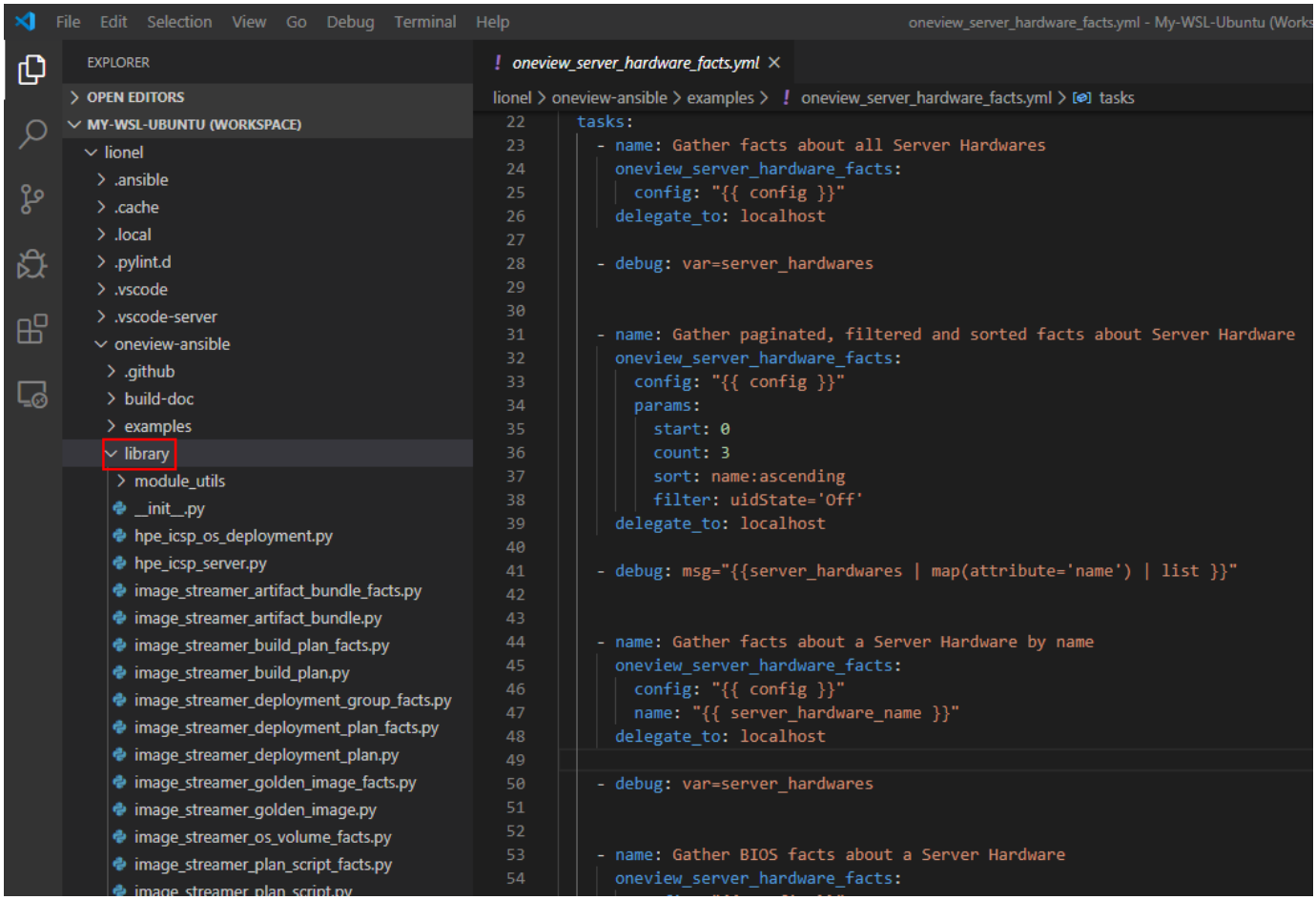
- This playbook provides several tasks examples on how to collect server hardware information. Each task uses the same `oneview_server_hardware_facts` Ansible module with different filter, options and count parameters.



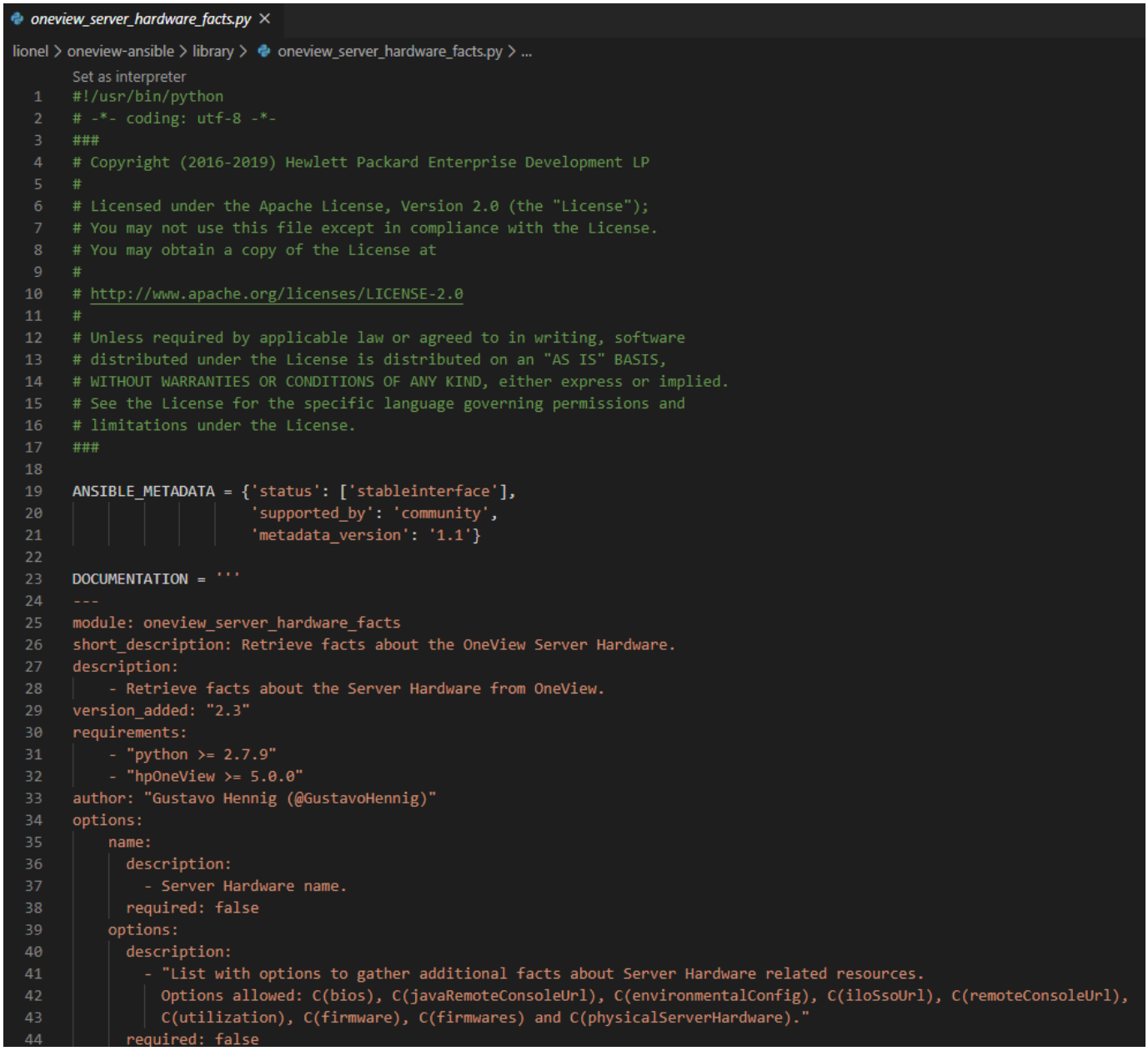
Note: Ansible uses YAML syntax for their playbooks because it is easy for humans to read/write.

TIP: YAML (a recursive acronym for "YAML Ain't Markup Language") is a human-readable data-serialization language that is sensitive to bad indentation! Notice that the properties vars and tasks are spaced 2 from the margin. This is called indenting and if you mess up with this, Ansible will throw an exception. Good news, the Ansible extension in VS Code does YAML validation so if your playbook is not correctly structured, you will see some warnings.

- Our Ansible modules are all located in `/oneview-ansible/library/`



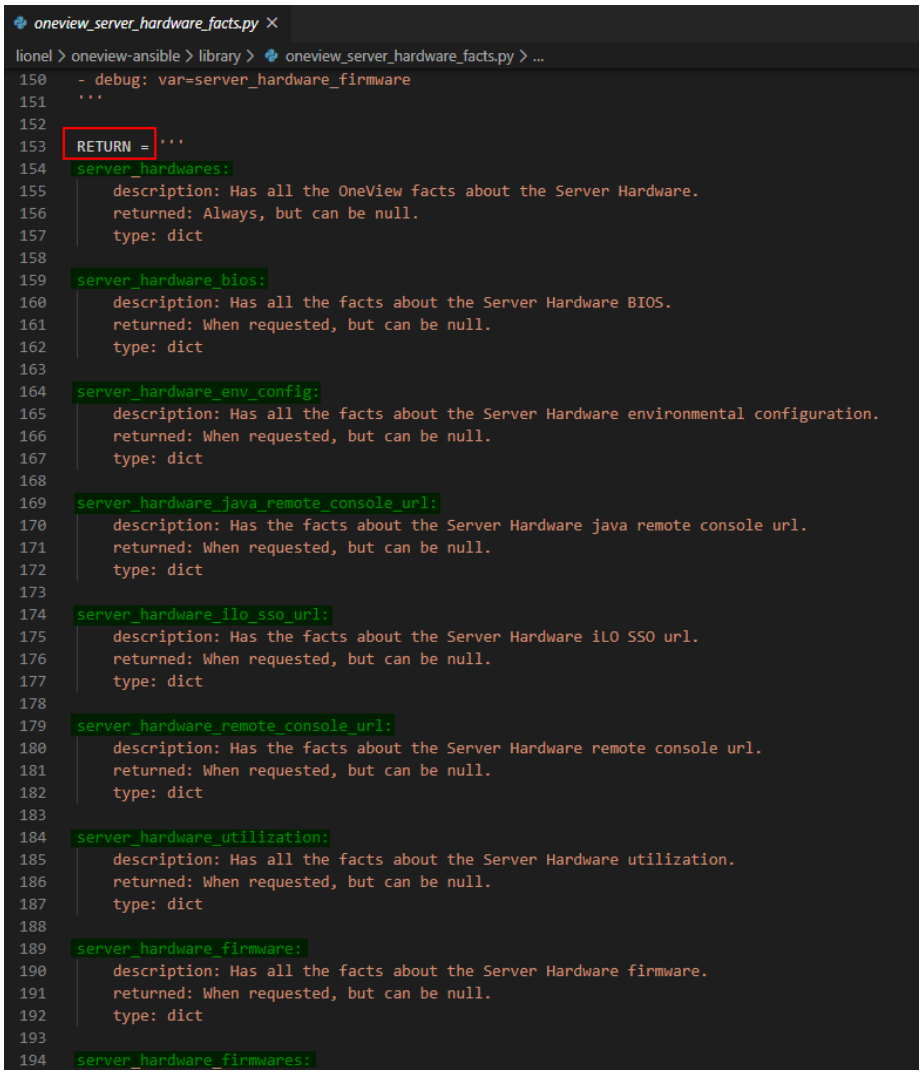
- Scroll-down and open the `oneview_server_hardware_facts.py` module:



```
oneview_server_hardware_facts.py
lionel > oneview-ansible > library > oneview_server_hardware_facts.py > ...
    Set as interpreter
1   #!/usr/bin/python
2   # -*- coding: utf-8 -*-
3   ###
4   # Copyright (2016-2019) Hewlett Packard Enterprise Development LP
5   #
6   # Licensed under the Apache License, Version 2.0 (the "License");
7   # You may not use this file except in compliance with the License.
8   # You may obtain a copy of the License at
9   #
10  # http://www.apache.org/licenses/LICENSE-2.0
11  #
12  # Unless required by applicable law or agreed to in writing, software
13  # distributed under the License is distributed on an "AS IS" BASIS,
14  # WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
15  # See the License for the specific language governing permissions and
16  # limitations under the License.
17  ###
18
19  ANSIBLE_METADATA = {'status': ['stableinterface'],
20                      'supported_by': 'community',
21                      'metadata_version': '1.1'}
22
23  DOCUMENTATION = '''
24  ---
25  module: oneview_server_hardware_facts
26  short_description: Retrieve facts about the OneView Server Hardware.
27  description:
28      - Retrieve facts about the Server Hardware from OneView.
29  version_added: "2.3"
30  requirements:
31      - "python >= 2.7.9"
32      - "hpOneView >= 5.0.0"
33  author: "Gustavo Hennig (@GustavoHennig)"
34  options:
35      name:
36        description:
37          - Server Hardware name.
38        required: false
39      options:
40        description:
41          - "List with options to gather additional facts about Server Hardware related resources.
42            Options allowed: C(bios), C(javaRemoteConsoleUrl), C(environmentalConfig), C(iloSsoUrl), C(remoteConsoleUrl),
43            C(utilization), C(firmware), C(firmwares) and C(physicalServerHardware)."
44        required: false
```

Our Ansible modules always document vital information about the module itself in the documentation section at the beginning of each module.

- OneView ansible modules (like *oneview_server_hardware_facts*) when executed, usually return some outputs in one or more variables. These variables are described at the end of the module documentation as illustrated below:



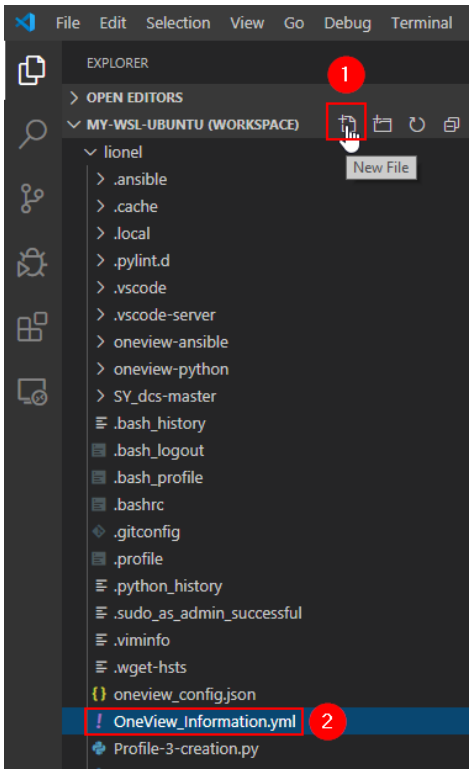
- As we can see, this module returns numerous values: `server_hardwares`, `server_hardware_bios`, `server_hardware_env_config`, etc. These are variables you can use in playbook to run additional tasks.

  In playbooks, you usually display on the console a returned value using:

  ```
  - debug: var=server_hardwares
  ```

  As described in the documentation, this will display all the OneView facts about the Server Hardware as a dictionary.

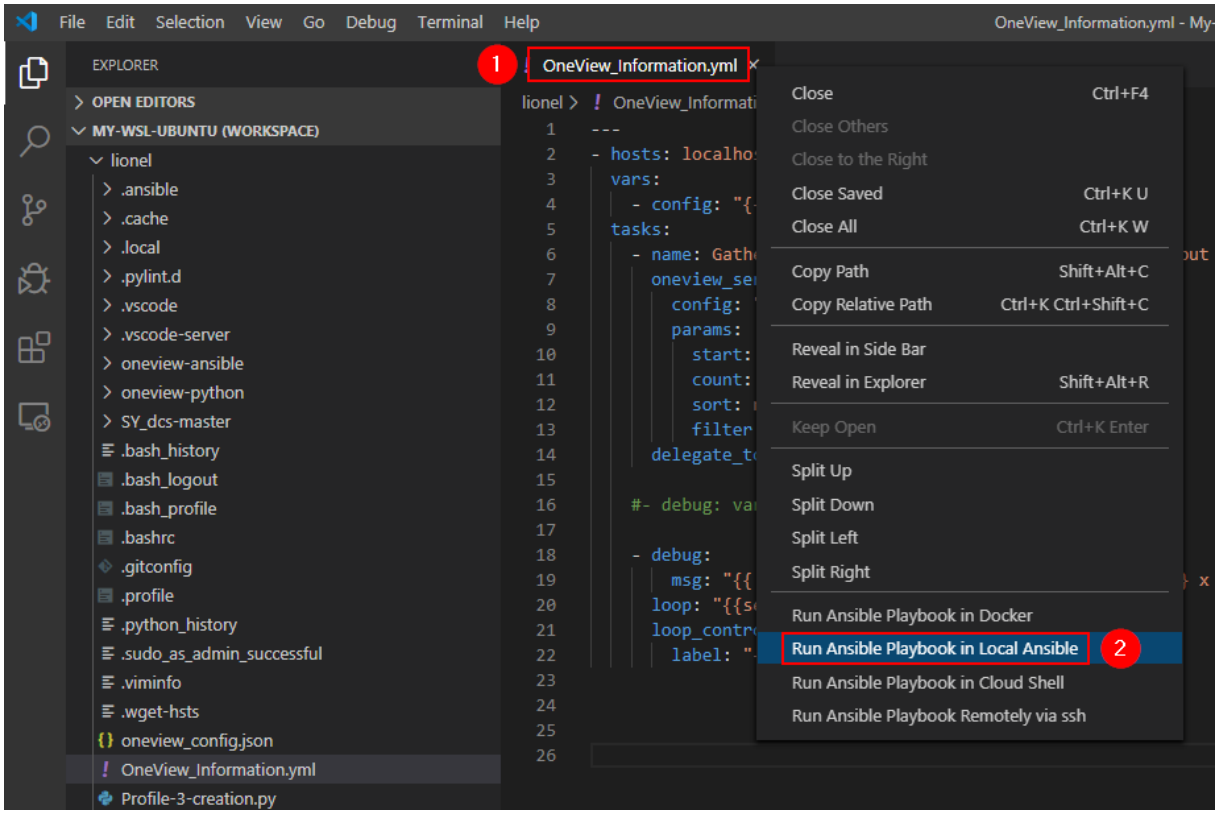
- Now let's create a new file in your user home directory named **OneView_Information.yml**



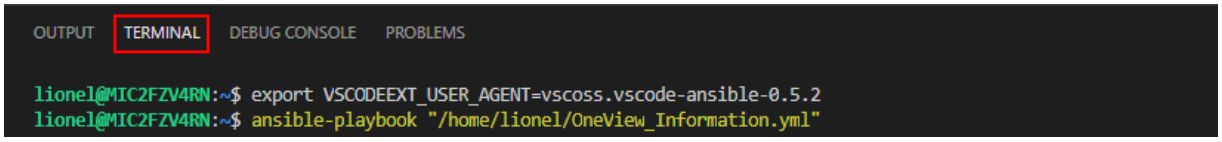
- Then copy/paste the following content:

```
---
- hosts: localhost
  vars:
    - config: "{{ playbook_dir }}/oneview_config.json"
  tasks:
    - name: Gather paginated, filtered and sorted facts about Server Hardware
      oneview_server_hardware_facts:
        config: "{{ config }}"
        params:
          start: 0
          count: 3
          sort: name:ascending
          filter: uidState='Off'
      delegate_to: localhost

    #- debug: var=server_hardwares

    - debug:
        msg: "{{ item.name }} has {{ item.processorCount }} x {{ item.processorType }} processors"
      loop: "{{server_hardwares}}"
      loop_control:
        label: "{{ item.model }}"
```

- Save the file by pressing **CTRL** + **S**
- To easily run the playbook, right-click on the tab and select **Run Ansible Playbook in Local Ansible**



Notice that VS Code automatically generates and runs the command `ansible-playbook "/home/<username>/oneview_alerts.yml"` in the terminal window:



- The console outputs the following:

```
PLAY [localhost] ***************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************
ok: [localhost]

TASK [Gather paginated, filtered and sorted facts about Server Hardware] *******************************************
ok: [localhost -> localhost]

TASK [debug] *******************************************************************************************************
ok: [localhost] => (item=Synergy 480 Gen10) => {
    "msg": "Synergy-Encl-1, bay 11 has 2 x Intel(R) Xeon(R) CPU E5620 @ 2.40GHz processors"
}
ok: [localhost] => (item=HPE Synergy 660 Gen9 Compute Module) => {
    "msg": "Synergy-Encl-1, bay 3 has 4 x Intel(R) Xeon(R) CPU E5620 @ 2.40GHz processors"
}
ok: [localhost] => (item=HPE Synergy 660 Gen9 Compute Module) => {
    "msg": "Synergy-Encl-1, bay 4 has 4 x Intel(R) Xeon(R) CPU E5620 @ 2.40GHz processors"
}

PLAY RECAP *********************************************************************************************************
localhost                  : ok=3    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

Formatted Server hardware information is displayed through our Ansible debug message task. We are using the `server_hardwares` variable generated by the `oneview_server_hardware_facts` module:

```
- debug:
    msg: "{{ item.name }} has {{ item.processorCount }} x {{ item.processorType }} processors"
  loop: "{{server_hardwares}}"
  loop_control:
    label: "{{ item.model }}"
```

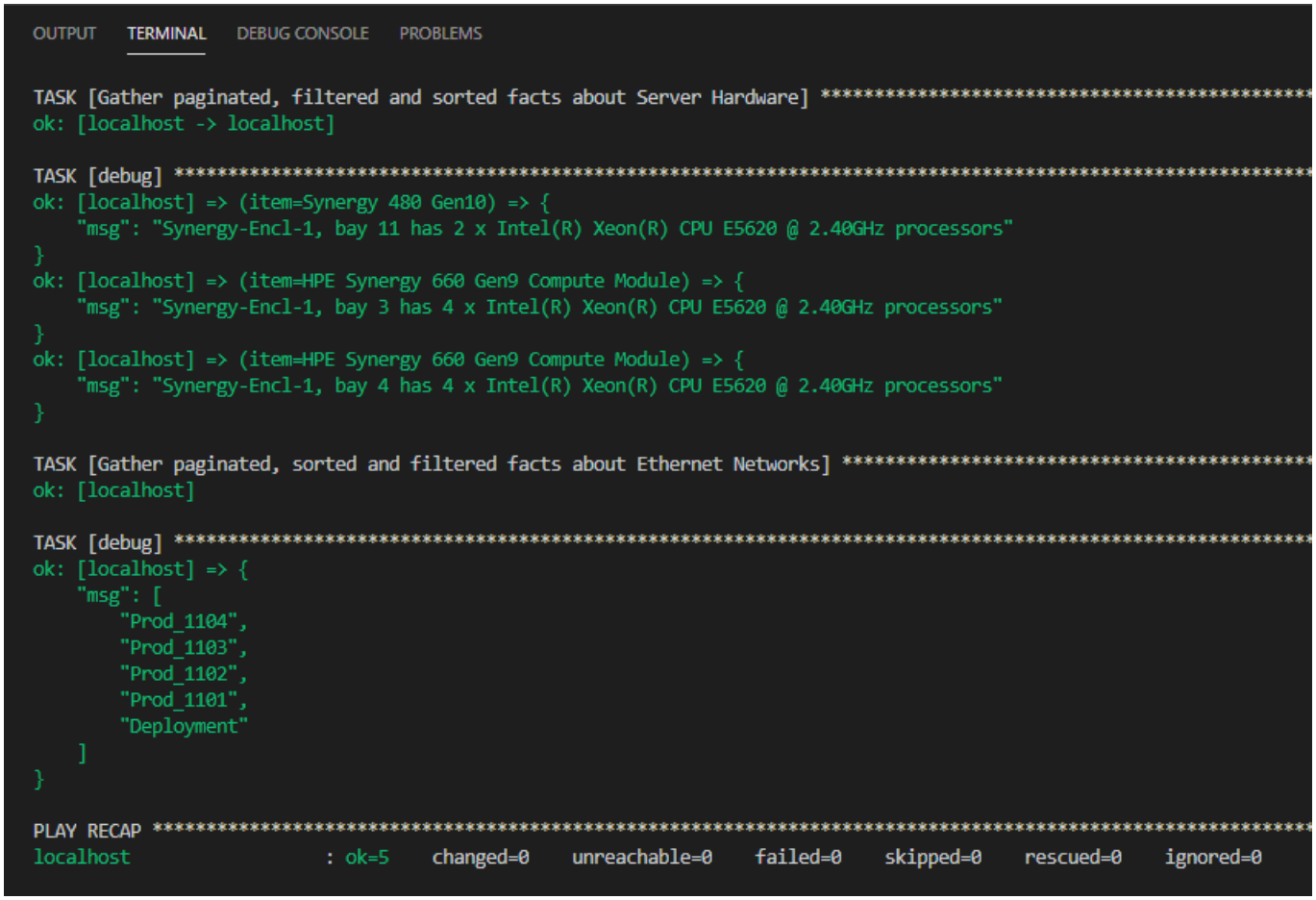
We use the `loop` option to go through the content of `server_hardwares` a dictionary object.

`loop_control` is used to avoid Ansible to display the entire content of the `{{ item }}` variable but instead just the `model`.

- Next, as a second fact example, we can collect some networks available in OneView by adding in the same playbook at the end:

```
    - name: Gather paginated, sorted and filtered facts about Ethernet Networks
      oneview_ethernet_network_facts:
        config: "{{ config }}"
        params:
          sort: 'name:descending'
          filter: "purpose=General"

    - debug: msg="{{ ethernet_networks  | map(attribute='name') | list }}"
```

- Save the file then run it:



Networks with a general purpose are displayed using a descending sort.

We can gather facts about all resources in OneView using parameters found in the module documentation to sort, filter, count, etc.

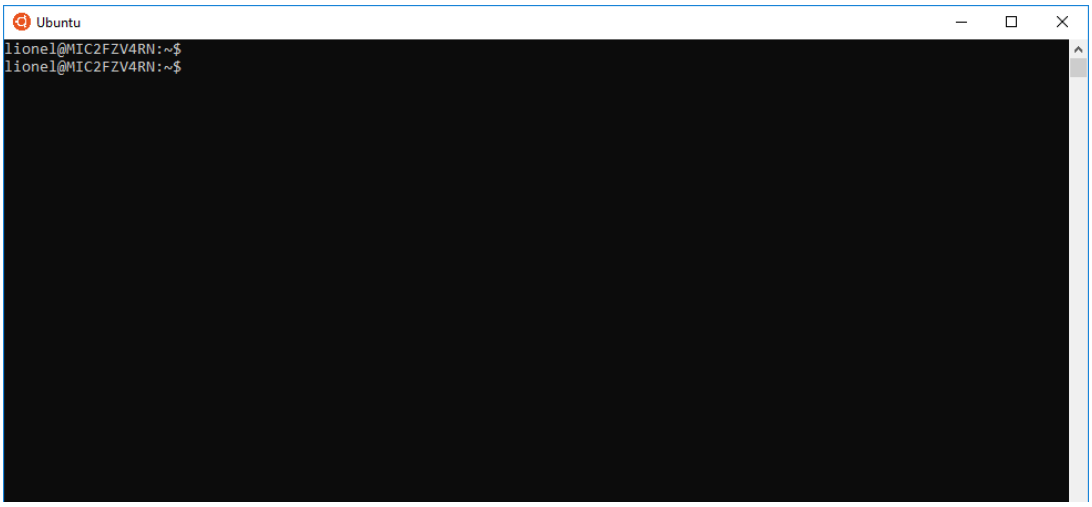
This concludes Ansible – Scenario 1 about collecting facts in OneView

Ansible – Scenario 2 – Provisioning New Servers

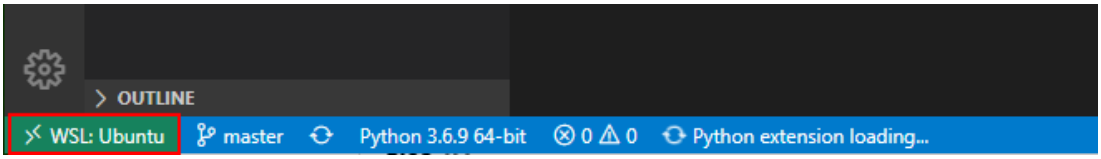
In this scenario, we are going to automate with Ansible the creation two server profiles using an existing Server Profile Template.

Prerequisites:

- Make sure your Ubuntu session running in WSL is started.



- Open VS Code using **Synergy demonstrations on WSL** workspace, ensure that the Remote WSL extension gets connected by checking the presence of *WSL: Ubuntu* in the status bar in the lower left corner:



- **Import notice**: This scenario can only be run with the Final configuration snapshot (i.e. when a Logical Enclosure is available)

One of the nice features with Ansible is that it can work against multiple systems in your infrastructure at the same time by using an inventory files, named *hosts* located in `/etc/ansible/hosts`

In the *hosts* inventory file, you can create groups of servers and use a specific group in an Ansible playbook to run some tasks that will be executed on all systems listed in this group.

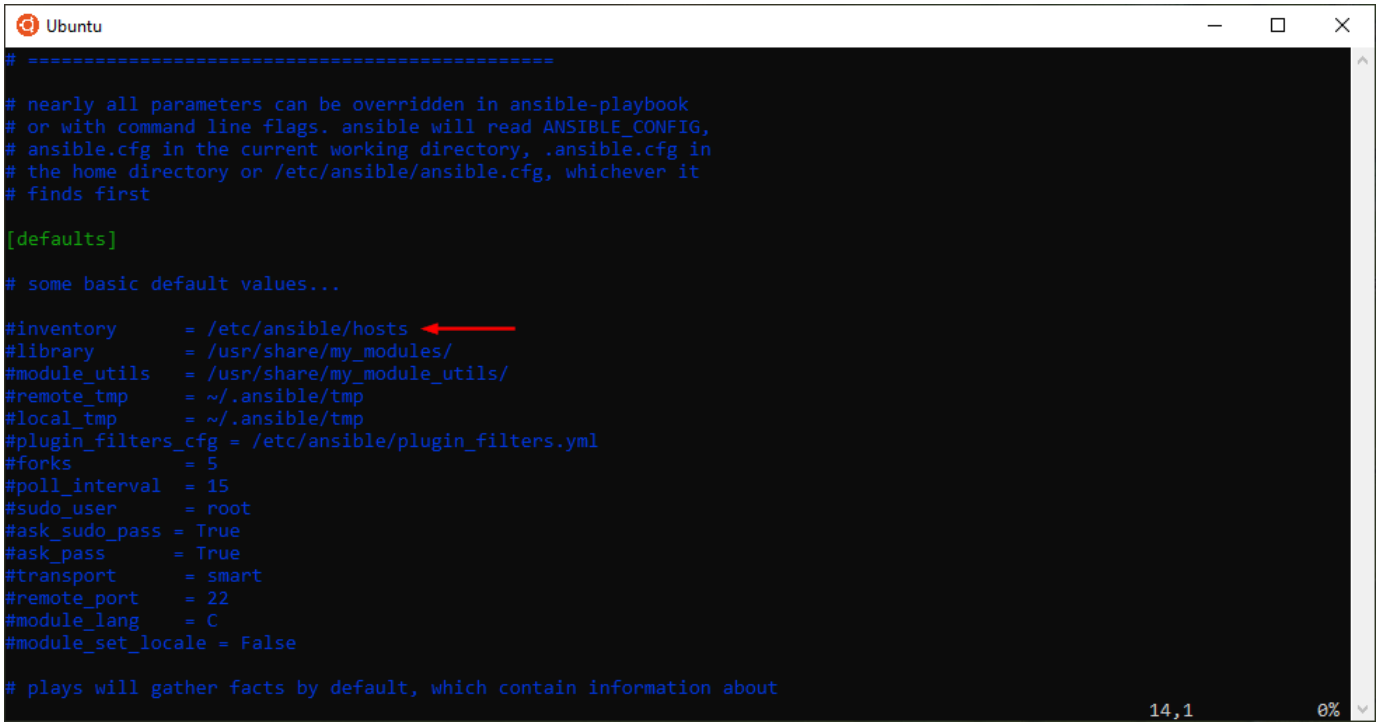
To illustrate this, we are going to create a *RHEL* group in the *hosts* file with two systems, *RH-1* and *RH-2*.

But in order to facilitate the edition in VS Code, we are going to create our own *hosts* file located in our user home directory. In order to do that, we need to quickly modify the Ansible configuration:

- Go to the WSL – Ubuntu console and enter:

```
sudo vi /etc/ansible/ansible.cfg
```

- Enter your password.
- Uncomment the inventory value:



- Press the letter **i** to put the VI editor in *Insert* Mode. Then edit the inventory path with:

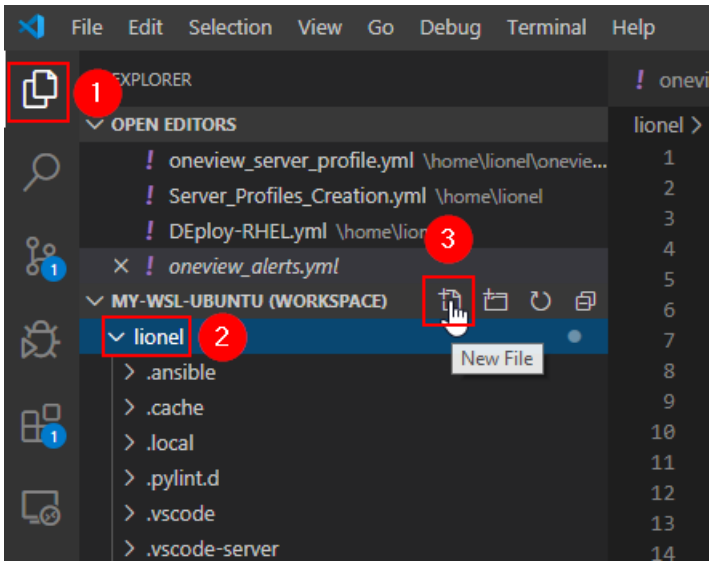
```
inventory      = /home/<username>/hosts
```

with <username> your username

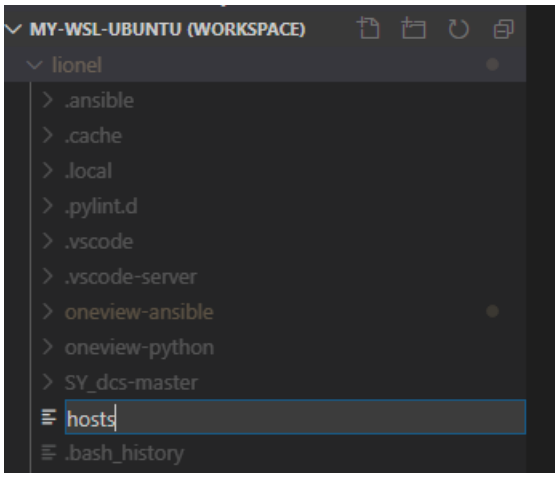
- Press **ESC** to exit *Insert* Mode, then type **:** (colon) to open the vi command prompt, type **wq** and press **ENTER** to Write and Quit vi

Ansible is now configured to use the *hosts* file located in our user home directory. Let's now create this file.

- Open VS Code, in the **Explorer** view, select your home folder then click on **New File**



- Named it **hosts**:

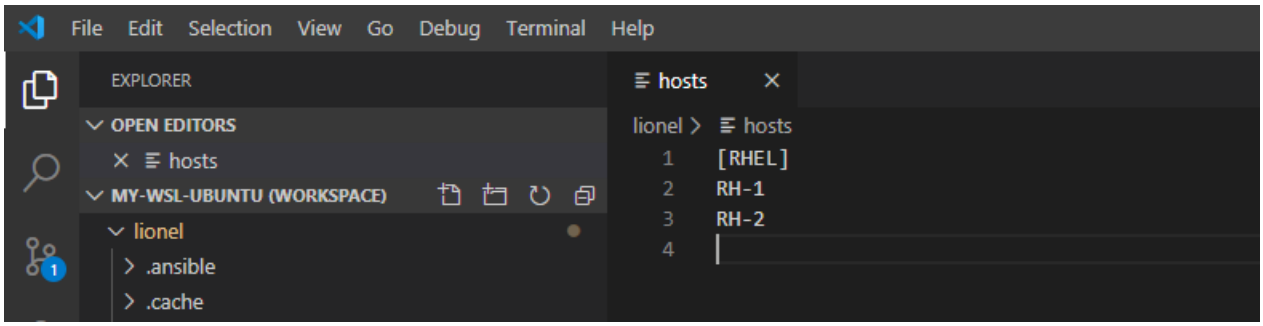


- Then add in the hosts file the following content:

```
[RHEL]
RH-1
RH-2
```

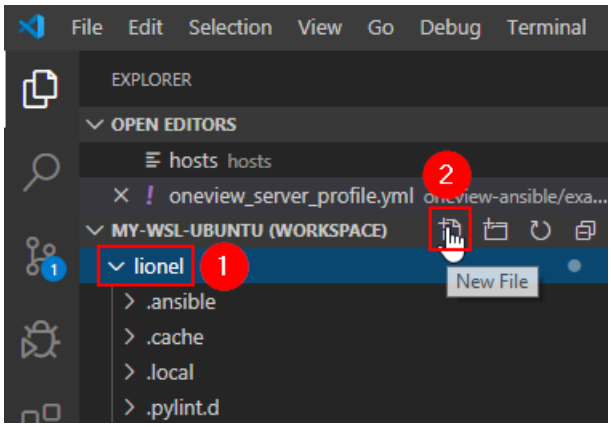
- Then save the file by pressing **CTRL** + **S**

Note: `[...]` defines *RHEL* as our group. *RH-1* and *RH-2* are the two systems defined in this group.

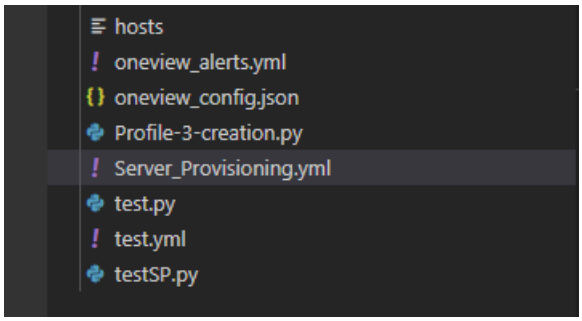


Now let's build a new playbook that will use this *hosts* file to create two server profiles (RH-1 and RH-2) from an existing Server Profile Template.

- Go back to VS Code, select your user home folder, click on **New File**



- Enter the name **Server_Provisioning.yml**



- Copy/paste the following playbook content:

```
---
- name: Ansible OneView Synergy playbook to deploy Compute Module(s) using a Server Profile Template
  hosts: RHEL
  gather_facts: no
  vars:
    - config: "{{ playbook_dir }}/oneview_config.json"
    - server_template: "HPE Synergy 480 Gen9 with Local Boot for RHEL Template"

  tasks:
    - name: Creating Server Profile [{{ inventory_hostname }}] from Server Profile Template [{{ server_
template }}]
      oneview_server_profile:
        config: "{{ config }}"
        data:
          serverProfileTemplateName: "{{ server_template }}"
          name: "{{ inventory_hostname }}"
      delegate_to: localhost
      register: result

    #- debug: var=server_hardware

    - name: Task result of the Server Profile(s) creation
      debug:
        msg: "{{ result.msg }}"

    - name: Powering on the Compute Module(s) [{{ server_hardware.name }}]
      oneview_server_hardware:
        config: "{{ config }}"
        state: power_state_set
        data:
            name : "{{ server_hardware.name }}"
            powerStateData:
                powerState: "On"
                powerControl: "MomentaryPress"
      delegate_to: localhost

    - debug:
        msg: "The server is located in {{ server_hardware.name }}"
```

- Save the content by pressing **CTRL** + **S**

This playbook contains two main tasks, the first one creates the server profiles:

- ❶: Creates one or more server profiles according to the *RHEL* group settings found in the hosts inventory file. The group is set by `hosts: RHEL` at the beginning of the playbook.
- ❷: Defines the Server Profile Template (SPT) that Ansible must use to generate the Server Profiles (SP), the SPT is set in line 7.
- ❸: Tells Ansible to use the hosts inventory file to generate the SP names.
- ❹: Displays the result of the SP creation task

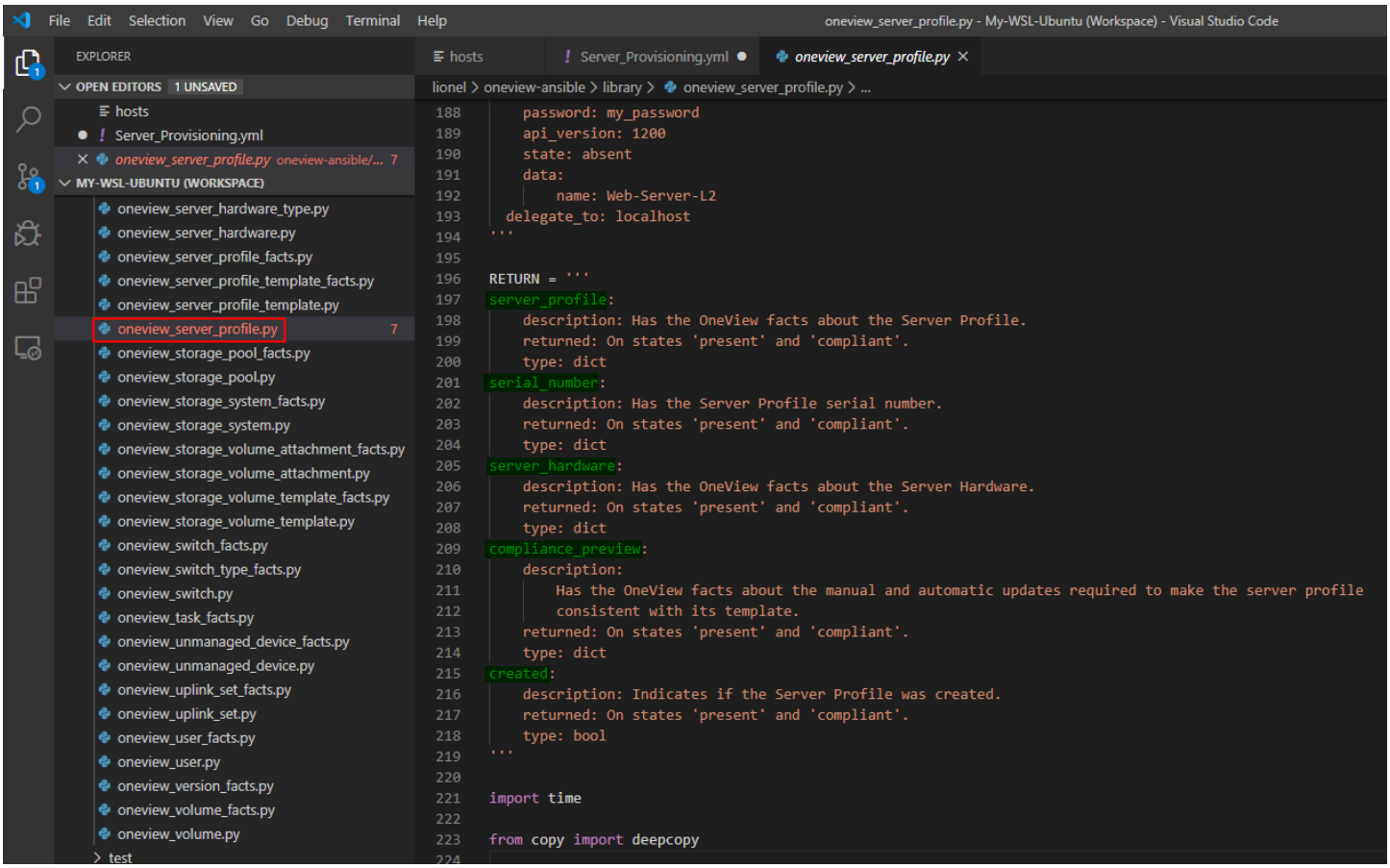
```
---
- name: Ansible OneView Synergy playbook to deploy Compute Module(s) using a Server Profile Template
  hosts: RHEL
  gather_facts: no
  vars:
    - config: "{{ playbook_dir }}/oneview_config.json"
    - server_template: "HPE Synergy 480 Gen9 with Local Boot for RHEL Template"

  tasks:
    - name: Creating Server Profile [{{ inventory_hostname }}] from Server Profile Template [{{ server_template }}]
      oneview_server_profile:                                                                                          ← 1
        config: "{{ config }}"
        data:
          serverProfileTemplateName: "{{ server_template }}"                                                           ← 2
          name: "{{ inventory_hostname }}"                                                                             ← 3
      delegate_to: localhost
      register: result

    #- debug: var=server_hardware

    - name: Task result of the Server Profile(s) creation
      debug:
        msg: "{{ result.msg }}"                                                                                        ← 4
```

Then in the second task, the servers are powered-on in ❶ then we display in ❷ the server location.

```yaml
- name: Powering on the Compute Module(s) [{{ server_hardware.name }}]
  oneview_server_hardware:
    config: "{{ config }}"
    state: power_state_set
    data:
        name : "{{ server_hardware.name }}"
        powerStateData:
            powerState: "On"
            powerControl: "MomentaryPress"
  delegate_to: localhost

- debug:
    msg: "The server is located in {{ server_hardware.name }}"
```

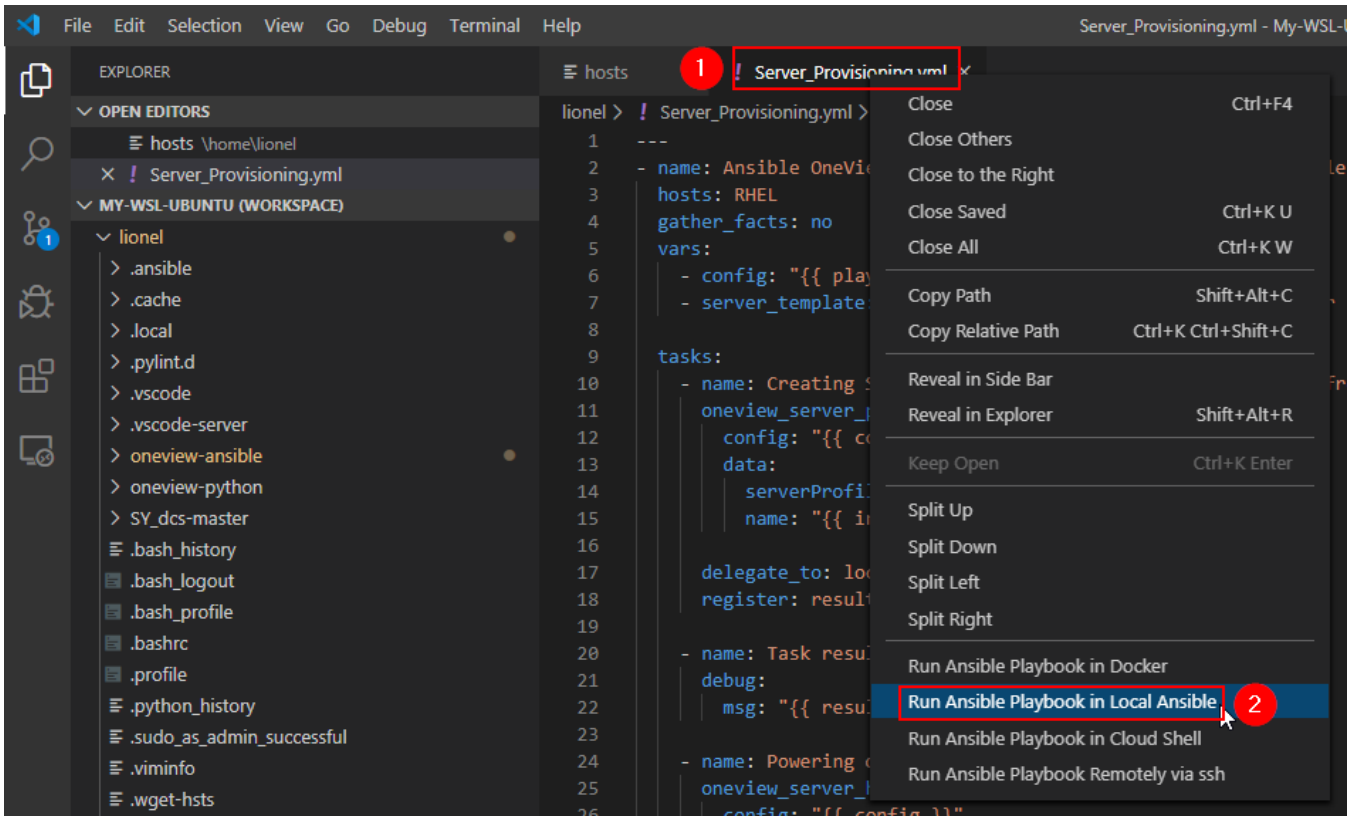
❶ ❷

As described below in the *oneview_server_profile* module documentation located in `/oneview-ansible/library/oneview_server_profile.py`, *oneview_server_profile* returns 4 variables, `server_profiles`, `serial_number`, `server_hardware`, `compliance_preview` and `created`.

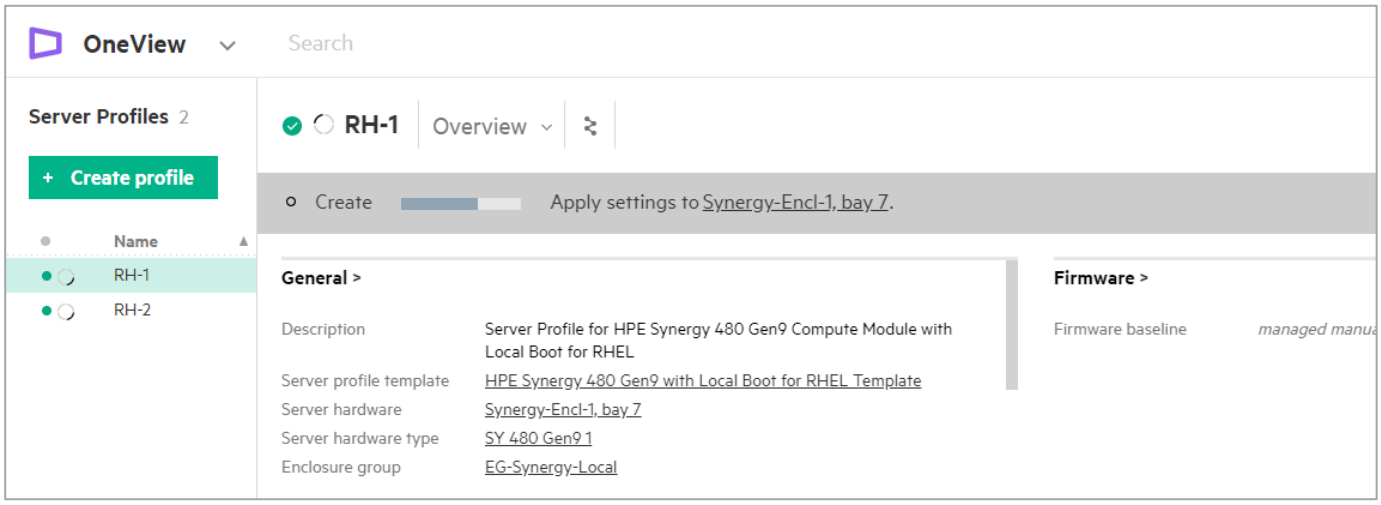


In our playbook, the last message we send to the console, is using one of those variables returned by the module when executed (i.e. `server_hardware`). We display only the *name* attribute using `server_hardware.name` to get only the server hardware location.

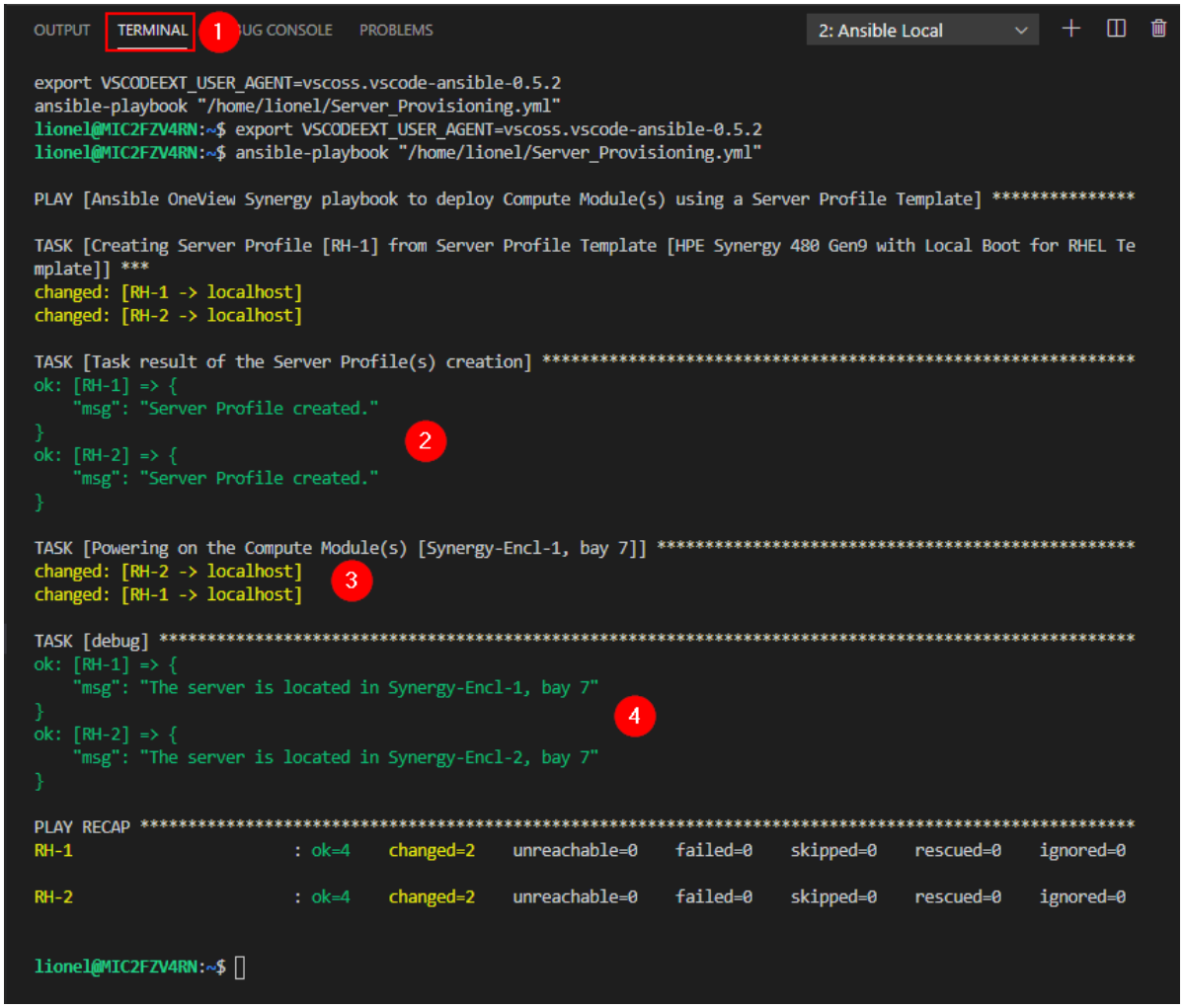
- Now to run the Ansible playbook, right-click on the tab then select **Run Ansible Playbook in Local Ansible**



- Open the web address https://192.168.56.101/#/profiles to show the creation of the two server profiles:

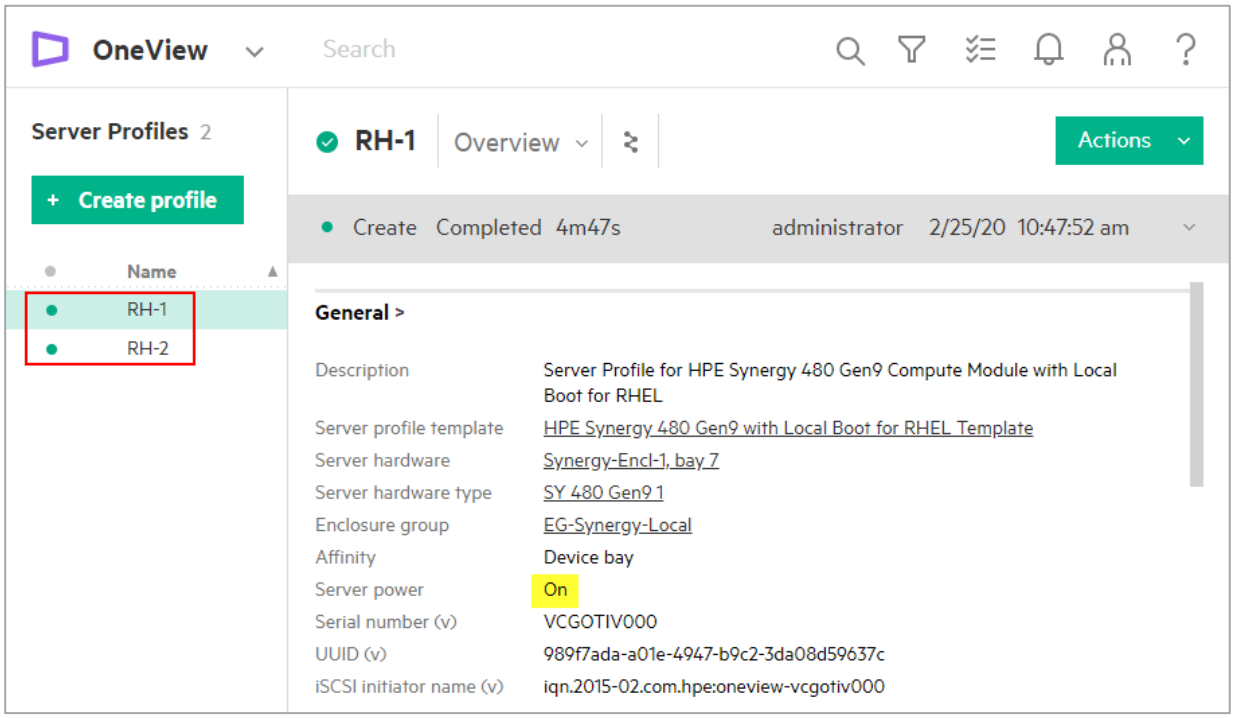


- Open the VS Code terminal to see the outputs of our Ansible playbook tasks:



- ❷: Task result of the server profiles creation.
- ❸: Task result of the powering-on of the server hardware.
- ❹: Displays the server hardware location used by the server profiles

- Once completed, two Server Profiles RH-1 and RH-2 are created, and the servers are powered-on:



This concludes Ansible - Scenario 2

Ansible – Scenario 3 – Unprovisioning Running Servers

Note: This scenario can only be run after *Ansible – Scenario 2* when server profiles *RH-1* and *RH-2* are available in OneView.

Now that the two servers that have been created in scenario 2 are running, we can explain to the customer that as easily as the provisioning has been made, we can now unprovision the servers and return the two server hardware back to the OneView resource pool.

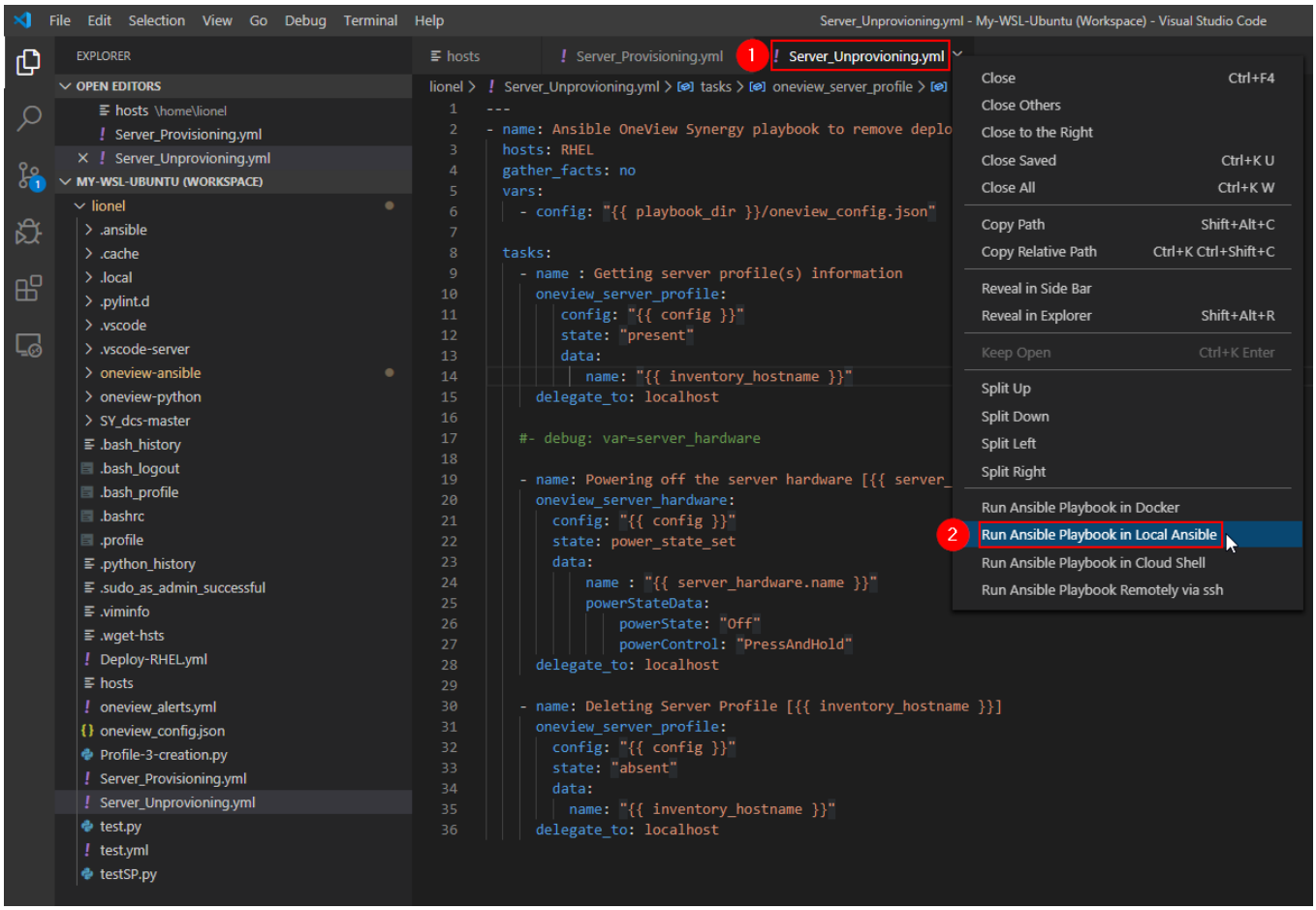
- To do this, create a new file, named it **Server_Unprovioning.yml** and add the following content:

```
---
- name: Ansible OneView Synergy playbook to remove deployed servers
  hosts: RHEL
  gather_facts: no
  vars:
    - config: "{{ playbook_dir }}/oneview_config.json"

  tasks:
    - name : Getting server profile(s) information
      oneview_server_profile:
         config: "{{ config }}"
         state: "present"
         data:
            name: "{{ inventory_hostname }}"
      delegate_to: localhost

    #- debug: var=server_hardware

    - name: Powering off the server hardware [{{ server_hardware.name }}]
      oneview_server_hardware:
        config: "{{ config }}"
        state: power_state_set
        data:
            name : "{{ server_hardware.name }}"
            powerStateData:
                powerState: "Off"
                powerControl: "PressAndHold"
      delegate_to: localhost

    - name: Deleting Server Profile [{{ inventory_hostname }}]
      oneview_server_profile:
        config: "{{ config }}"
        state: "absent"
        data:
          name: "{{ inventory_hostname }}"
      delegate_to: localhost
```

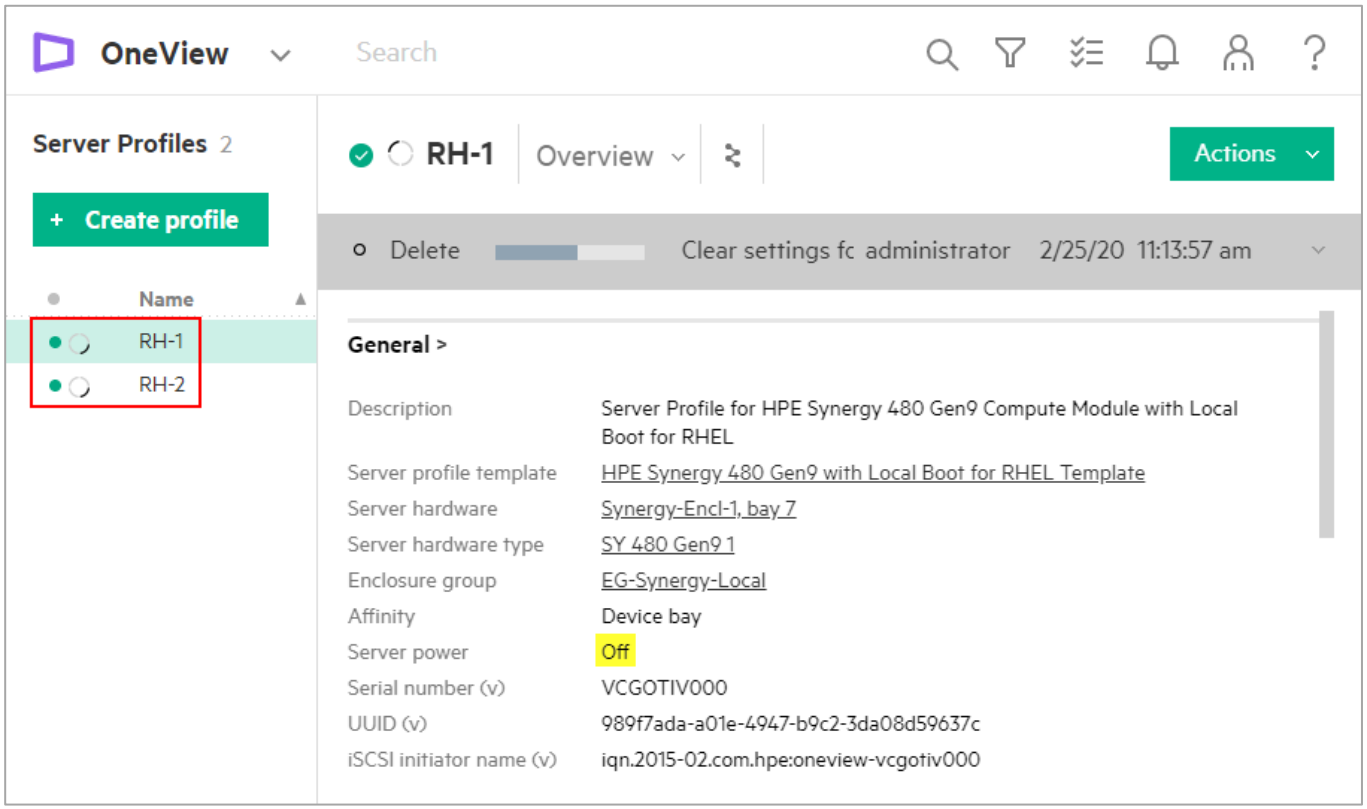
This playbook has three tasks:

  - Getting server profiles information using the *hosts* file inventory information.
  - Powering off the server hardware using the name collected from the server profile
  - Deleting the server profiles using the name pulled from the *hosts* files.

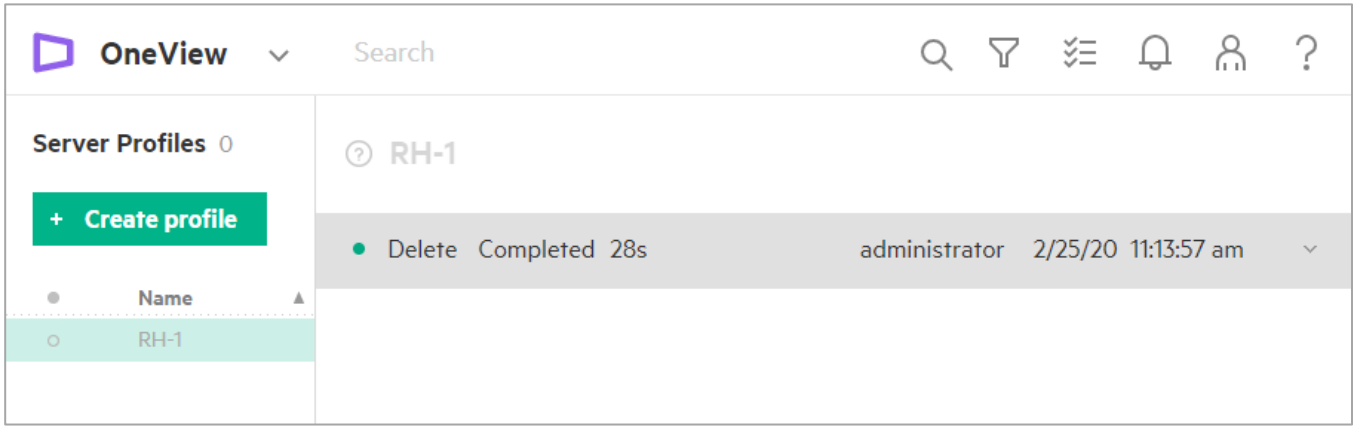
- To run the playbook, right click on the file tab then select **Run Ansible Playbook in Local Ansible**



- Both servers should power-off and the server profiles should be erased.



- After a few seconds, the server profiles are deleted:



- In the terminal, the following outputs get displayed:

```
lionel@MIC2FZV4RN:~$ export VSCODEEXT_USER_AGENT=vscoss.vscode-ansible-0.5.2
lionel@MIC2FZV4RN:~$ ansible-playbook "/home/lionel/Server_Unprovioning.yml"

PLAY [Ansible OneView Synergy playbook to remove deployed servers] *************************************************

TASK [Getting server profile(s) information] ***********************************************************************
ok: [RH-2 -> localhost]
ok: [RH-1 -> localhost]

TASK [Powering off the server hardware [Synergy-Encl-1, bay 7]] ****************************************************
changed: [RH-2 -> localhost]
changed: [RH-1 -> localhost]      1

TASK [Deleting Server Profile [RH-1]] ******************************************************************************
changed: [RH-1 -> localhost]
changed: [RH-2 -> localhost]      2

PLAY RECAP *********************************************************************************************************
RH-1                       : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

RH-2                       : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

- ❶: Task result of the server hardware powering-off.
- ❷: Task result of the server profiles deletion.

This concludes Ansible – Scenario 3

We have reached the end of our scenarios to demonstrate a Synergy Infrastructure programmability, infrastructure as-code and all the good benefits and features of our Unified API.

In the next chapter, we are going to reset our environment to prepare our next customer visit.

Chapter-8 - How to reset the Synergy demonstration environment

We have successfully completed all our live demos and we need now to reset our environment to be ready for our next customer live demonstrations.

The procedure is simple as we have prepared two snapshots to return easily and quickly to a previous state of our DCS appliance. As a reminder, each snapshot provides a different use case:

1- First snapshot: OneView appliance first time setup is done (IP addresses set, discovery of all enclosures and servers is done) but the Synergy frames are not configured (no LE, no LIG, no EG, no network)

   ⇨ Can be used to show how to automate the setup of Synergy and the power of our infrastructure as code implementation.

2- Second snapshot: OneView appliance is fully configured with LE, EG, LIG and some networks.

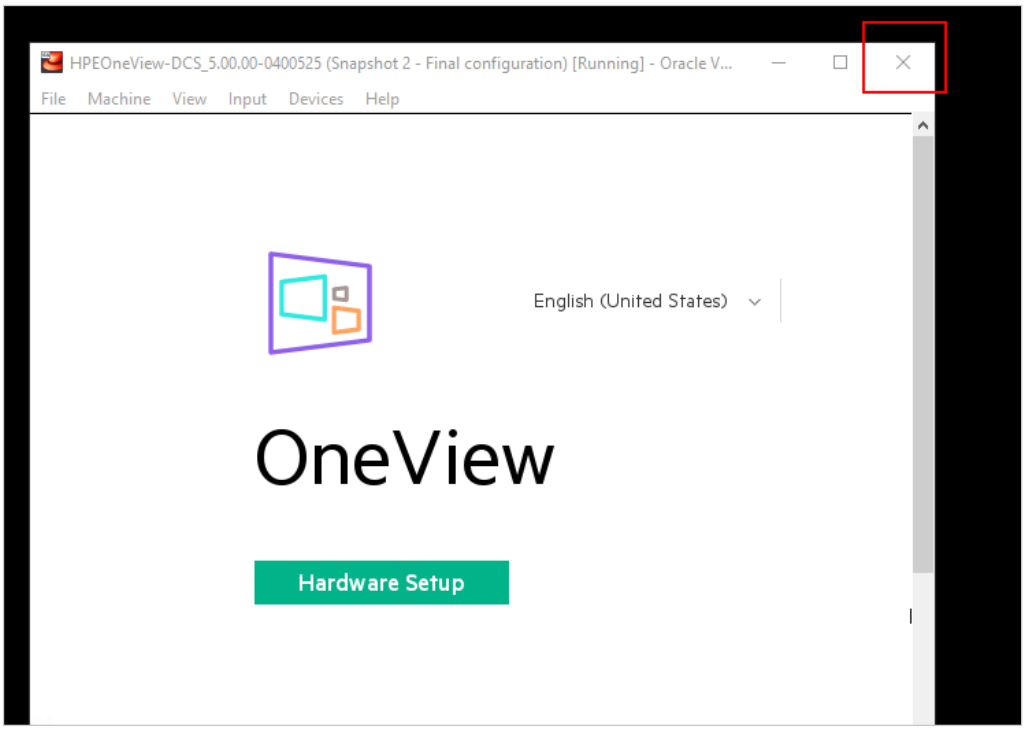
   ⇨ Can be used to run demos with an already configured environment to demonstrate features of the Composable infrastructure like creating server profiles, adding networks, modifying VC configuration, etc.

Shutting down the Synergy Composer Demonstration appliance

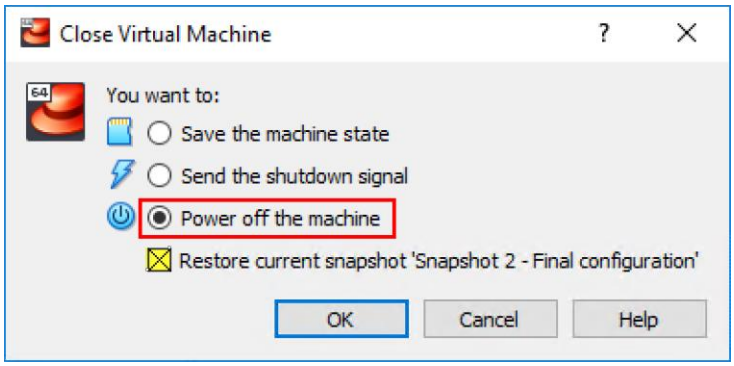
With VirtualBox, when shutting down a virtual machine, you have a "Restore current snapshot" option if you want VirtualBox to load the most recent snapshot the next time you start up the virtual machine again. This is a very convenient and easy option to restore the appliance back to the pre-configured state, just before our live demonstration scenarios.

To restore the appliance back to a pre-demo state:

- Click on the **Close** button in the upper-right corner of the window of the DCS appliance virtual machine



- Select **Power off the machine** and check the restore current snapshot option to restore the **Final configuration** snapshot the next time you start the appliance:



- Click the **OK** button to begin the shutdown process.

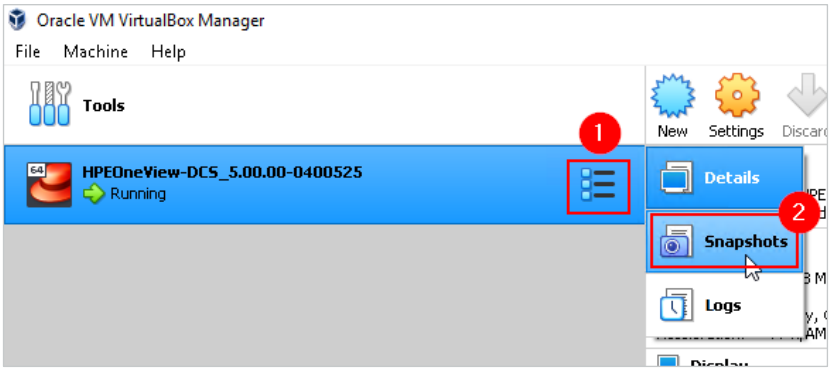
Note: By default, VirtualBox shutdown dialog provides a restore snapshot option with the latest created snapshot.

Now the next time you start the DCS appliance, you will be ready to run your live demonstration scenarios again.

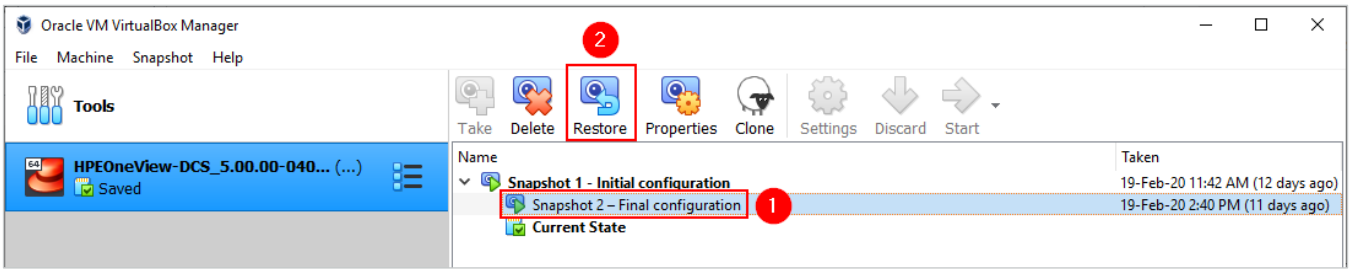
Resetting the Synergy Composer Demonstration appliance to the fully configured state

To start the appliance with the Synergy frames fully configured (with LE, LIG, EG and networks) in order to run the demos and demonstrate features of the Composable infrastructure, we need to restore the second snapshot.

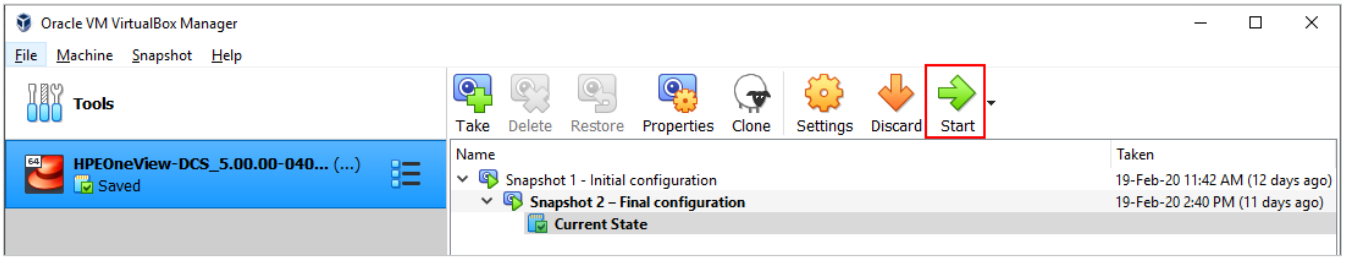
- Select the **Snapshots** option from the **Tools** menu of the DCS appliance:



- Select **Snapshot 2 – Final configuration** then click **Restore**



- Then start the appliance by selecting **Start**



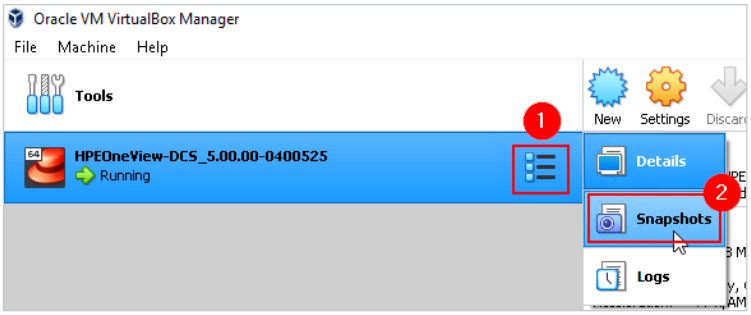
Note: With VirtualBox, rolling back to one of the previous snapshots can only be done when a VM is not running.

Note: When you start the DCS appliance using the snapshots prepared in this document, you should never see OneView starting and taking several minutes to start. If you see OneView starting, shutdown the VM and start again using the earlier procedure.

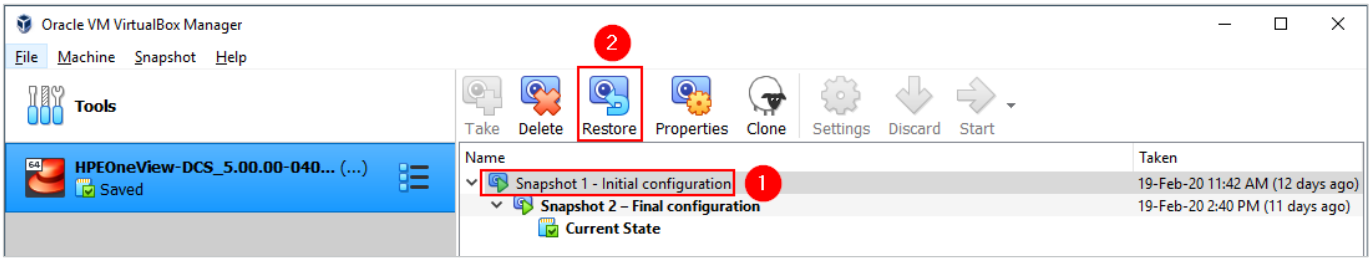
Resetting the Synergy Composer Demonstration appliance to the unconfigured state

To start the appliance with the Synergy frames unconfigured (no LE, no LIG, no EG, no network) in order to show how to automate the setup of Synergy, we need to restore the first snapshot.

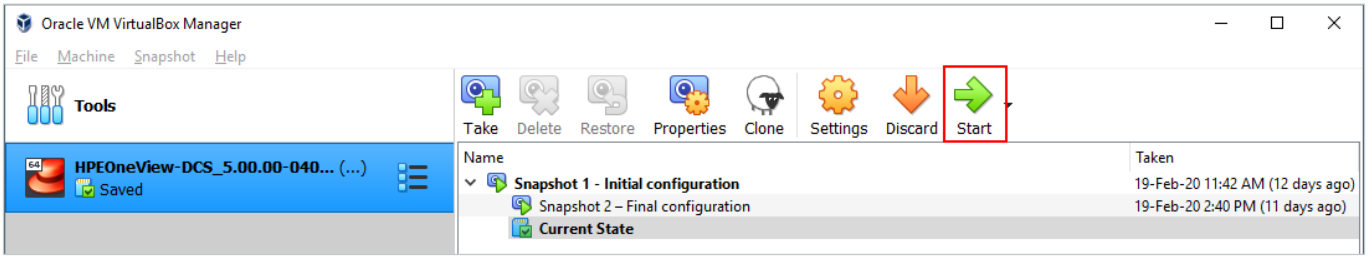
- Select the **Snapshots** option from the **Tools** menu of the DCS appliance:



- Select **Snapshot 1 – Initial configuration** then click **Restore**



- Then start the appliance by selecting **Start**



Note: With VirtualBox, rolling back to one of the previous snapshots can only be done when a VM is not running.

Note: When you start the DCS appliance using the snapshots prepared in this document, you should never see OneView starting and taking several minutes to start. If you see OneView starting, shutdown the VM and start again using the earlier procedure.

This concludes Chapter-8

Troubleshooting

Problem:

You are seeing a **VT-x is not available (VERR_VMX_NO_VMX)** in VirtualBox when starting the VM

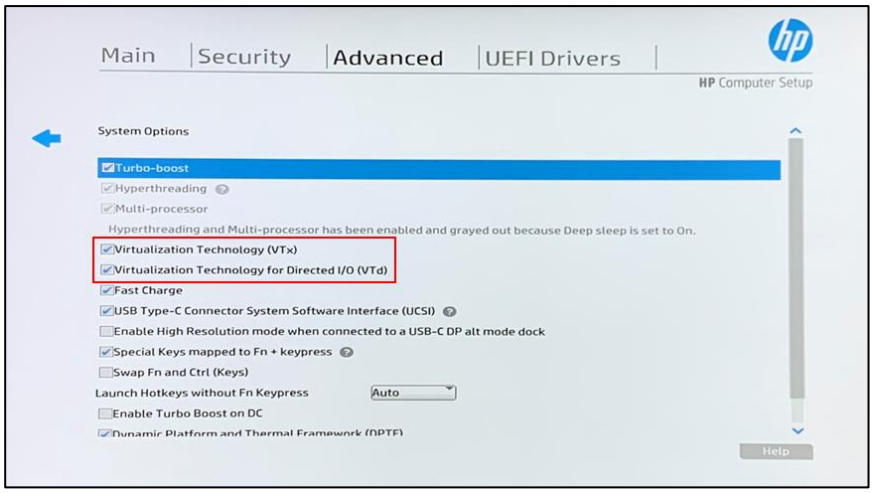
Intel VT-x is a set of processor enhancements to improve virtualization performance.

Oracle VM VirtualBox uses hardware virtualization and requires Intel VT-X to be enabled or not exclusively used by other software.

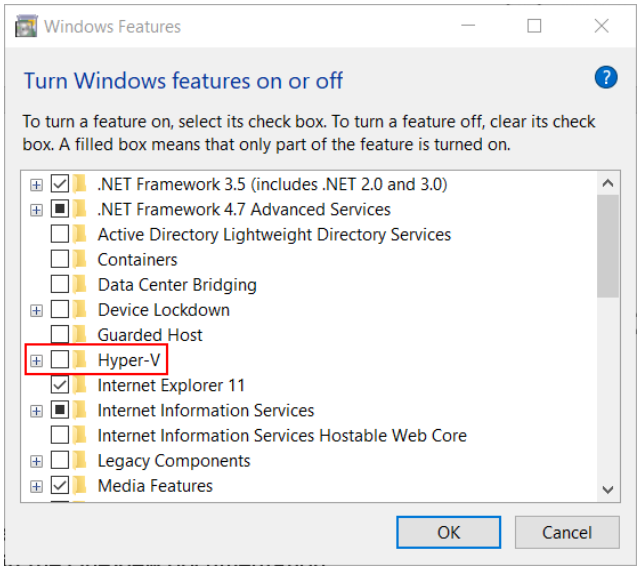
Solution:

- Make sure Virtualization (VT-x) is enabled in your BIOS.

  Note: On HP EliteBook 840 you must repeatedly press the **Esc** key until the Startup Menu opens. Press **F10** to enter the BIOS Setup Utility. Go to **Advanced** / **System Options**



- Make sure *Hyper-V* is disabled from Windows features. (Run | OptionalFeatures.exe)

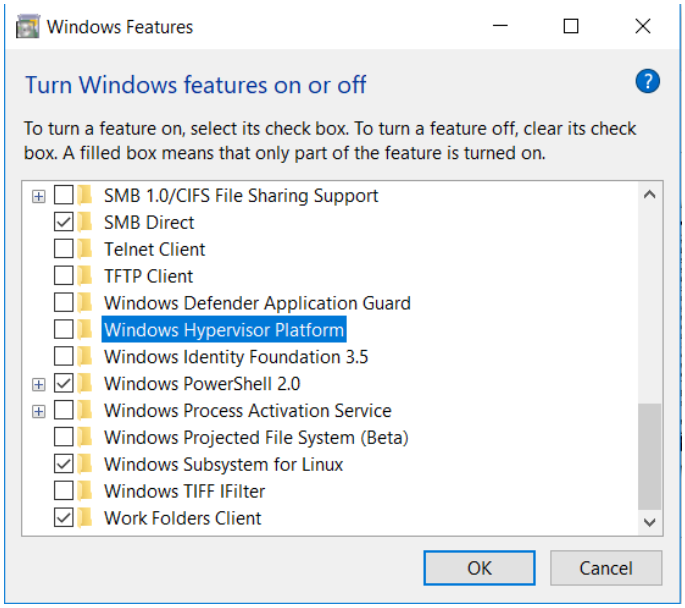


You can also run the following command to disable Hyper-V:

```
dism.exe /Online /Disable-Feature:Microsoft-Hyper-V
```

Note: If running, Hyper-V is taking exclusive use of VT-x so it is required to turn off Hyper-V to release VT-x

- Make sure *Windows Hypervisor Platform* is disabled from Windows features (if present).

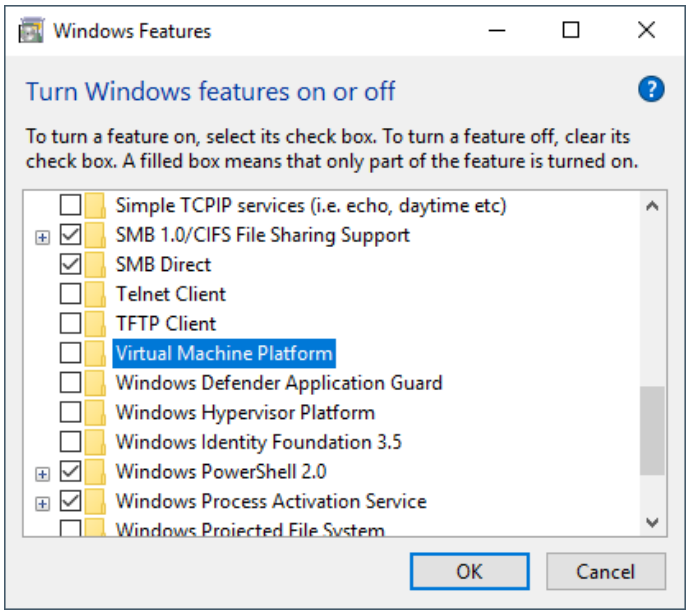


Or run:

```
dism.exe /Online /Disable-Feature:HypervisorPlatform
```

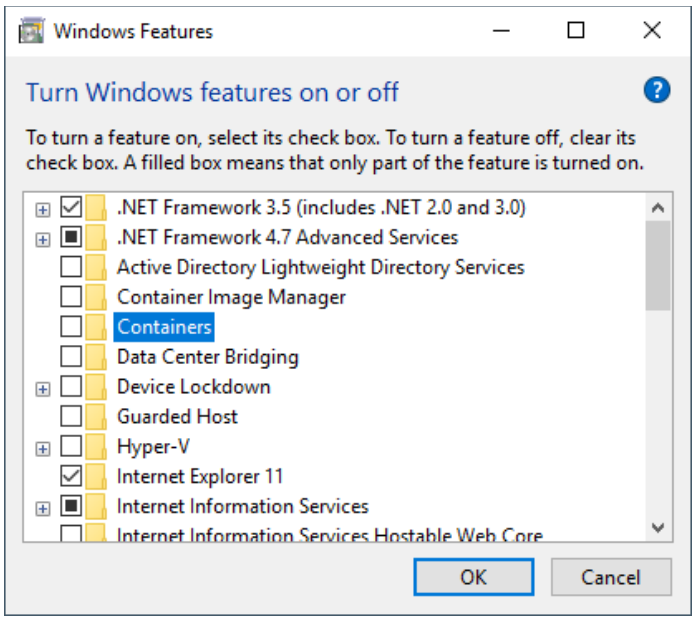
Note: If running, *Windows Hypervisor Platform* is taking exclusive use of VT-x so it is required to turn it off

- Make sure *Virtual Machine Platform* is disabled from Windows features (if present).



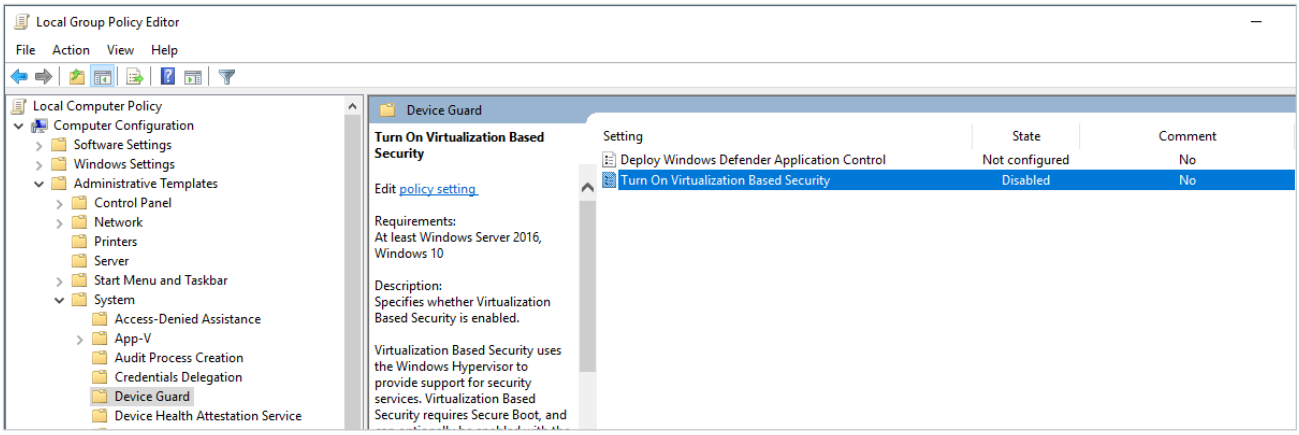
Note: If running, *Virtual Machine Platform* is taking exclusive use of VT-x so it is required to turn it off

- Make sure *Container* is disabled from Windows features (if present).



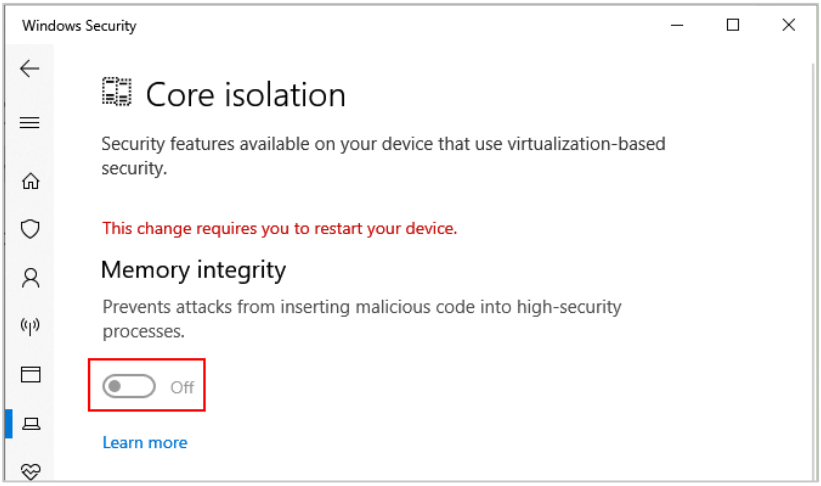
Note: If running, *Container* is taking exclusive use of VT-x so it is required to turn it off

- On some Windows hosts with an EFI BIOS, Device Guard or Credential Guard may be active by default and interferes with OS level virtualization apps in the same way that Hyper-V does. These features need to be disabled. On Pro versions of Windows, you can do this using **gpedit.msc** then set **Local Computer Policy** > **Computer Configuration** > **Administrative Templates** > **System** > **Device Guard** > Turn **Virtualization Based Security** to **Disabled**.



If you cannot use gpedit for some reason, then the equivalent registry hack is to find the key HKLM|SYSTEM|CurrentControlSet|Control|DeviceGuard|EnableVirtualizationBasedSecurity|Enabledand set it to 0.

- On Win10 hosts, check **Windows Defender** > **Device Security** > **Core Isolation Details** and make sure settings in this panel are turned **off**. A reboot is required to make this change.
"Core isolation [includes] security features available on your device that use virtualization-based security"



Hardware and Software versions used to build this demonstration environment

Major components used in this paper are listed here. The list is not exhaustive and is only intended to provide guidance.

Hardware description:

- HP EliteBook 840 G5
- 16G of RAM
- Intel(R) Core(TM) i7-8650U CPU @ 1.90GHz
- System bios Q78 Ver. 01.09.01 - 10/16/2019
- SAMSUNG MZVLW512HMJP 512GB PCI Express 3.0 x4 (NVMe) SSD Drive.

Software versions:

- Windows 10 version 1809 (OS Build 17763.1039)
- Visual Studio Code version 1.42.1
- Oracle VM VirtualBox version 6.1.4 r136177 (Qt5.6.2)
- HPE OneView DCS 5.00 Z7550-96681
- Ubuntu 20190521 build on Ubuntu 18.04 LTS
- Ansible Modules for HPE OneView 5.4.0 with create_profiles_in_parallel 11/27/19 fix
- HPE OneView Python SDK 5.00
- Python 2.7.17
- Ansible 2.9.4
- PowerShell for OneView library 5.0.2341.1920

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Summary

The HPE Synergy demonstration environment installation is complete.

Today's Idea Economy is driving IT leaders to find new and innovative ways to deliver the flexibility of hybrid IT solutions while reducing complexity and operating costs. Composable Infrastructure provides the promise of allowing IT to provision and manage traditional workloads along with new mobile and cloud-native applications from a single infrastructure, allowing you to achieve the vision of infrastructure as a code.

You have now the environment to seamlessly prove this and demonstrate the power of a Synergy Composable Infrastructure!

And remember, a product demonstration is one of your best tools to strongly impact your customers to adopt new technologies!

Happy demonstrations!

To help us improve this document, please provide feedback at lio@hpe.com.

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