

## INFO813 Practical project documentation template (Engineering journal)

### Stage Number

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When doing practical work it is common practice and extremely useful to document the steps you took. This assists you make your learning more tangible and organize it. The more detail you can provide the better it is so that if ever you want to configure it in the future you have a personal record documented.

The project book gives the main implementation steps. However this documentation report requires you document what you did at each implementation step as you are doing the practical project. It is not advised to do this at the end otherwise you are likely to forget what you did. You can alter the format of this template as long it includes all the relevant information

Please write this in your own words as it is a record of your work. Copied material is not accepted.

Describe the Design of your project and justify your design. (100 words)

My project follows the Option 1 outline from Systems Essentials Stage 1, incorporating a Windows 10 22H2 Pro client, a Windows Server 2022, and a FortiGate firewall acting as both a firewall and router. The FortiGate firewall routes traffic between the Windows Server and hosts while securing connections to the internet. Although Cisco routers, switches, and firewalls are ideal based on course teachings, I opted for a practical setup using my home lab. Instead of VMware Workstation and the preconfigured WINTEC EVE-NG image, I used Windows Hyper-V Manager to host my EVE-NG server, providing flexibility and aligning with real-world configurations.

Describe the key features of one competing/alternative technology and compare it to the one implemented in the project (Pros and Cons). (200 words)

#### **Comparison of Hyper-V and VMware Workstation**

Hyper-V, a Microsoft-based virtualization platform, and VMware Workstation, a product of VMware, both serve as powerful tools for creating and managing virtual machines (VMs). Each has distinct features and advantages, making them suitable for different use cases.

#### **Key Features of VMware Workstation:**

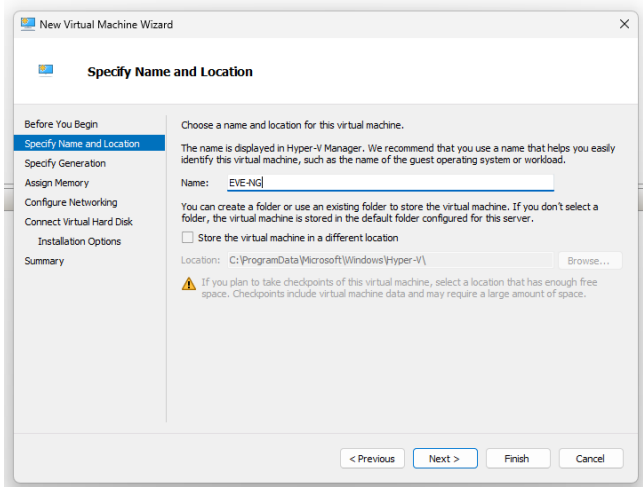
- **Cross-Platform Support:** Runs on both Windows and Linux operating systems.
- **Snapshot Management:** Allows taking multiple snapshots of VMs, useful for development and testing environments.
- **Enhanced Graphics Support:** Offers better 3D acceleration, supporting applications requiring advanced graphics.
- **Isolation and Security:** Provides robust sandboxing for virtual environments, enhancing security.

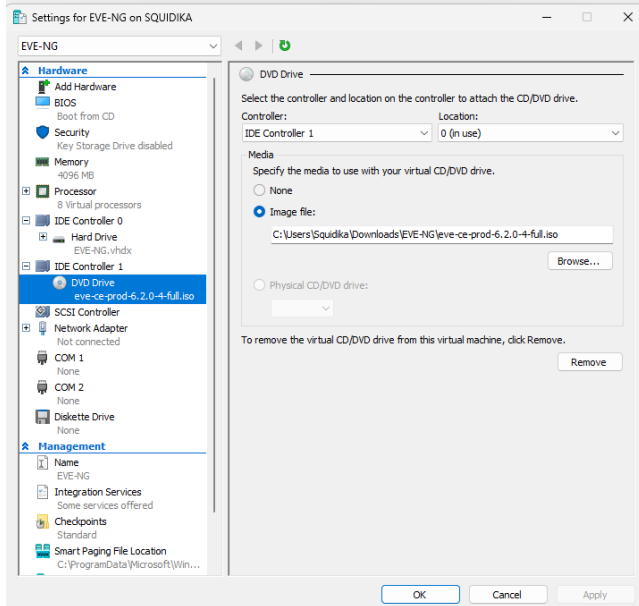
- **Portability:** VMs created on VMware Workstation can often be used on other VMware products like vSphere.

#### Comparison:

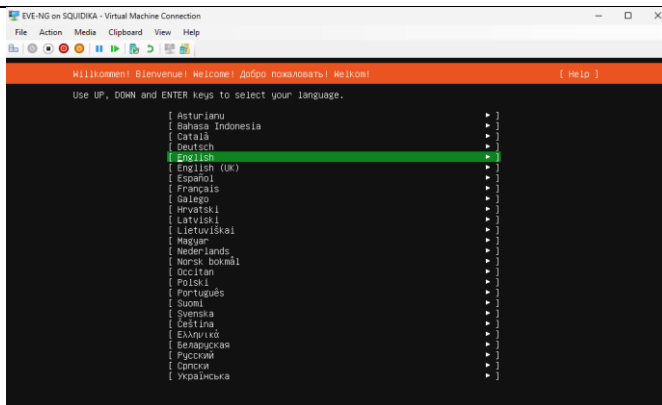
- **Ease of Use:** VMware Workstation is more user-friendly, with a GUI-centric approach, while Hyper-V is more integrated into the Windows ecosystem, accessible via Hyper-V Manager or PowerShell.
- **Performance:** Hyper-V has direct integration with the Windows kernel, leading to potentially better performance for enterprise-level virtualization.
- **Cost:** Hyper-V is free with Windows Pro/Enterprise editions, while VMware Workstation is a paid product.
- **Hardware Requirements:** Hyper-V requires SLAT-capable CPUs, which might limit compatibility, whereas VMware Workstation is more forgiving.
- **Advanced Features:** Hyper-V supports features like live migration and clustering, ideal for enterprise environments, whereas VMware Workstation caters to individual users or developers.

In conclusion, VMware Workstation excels in user-friendliness and cross-platform support, making it suitable for development and testing. Hyper-V, with its enterprise-grade features, better integrates with Windows, serving business-focused needs.

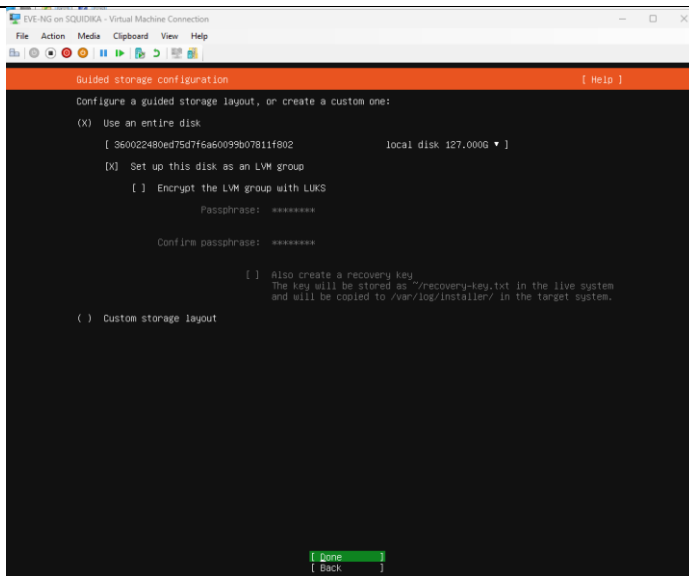
Section summary	Implementation details at each step e.g. screenshots, written steps, value of settings, commands used, results, answers to questions etc where applicable.	Justification if needed
STEP 1	<ul style="list-style-type: none"> <li>• Install the Emulated Virtual Environment – Next Generation (EVE-ng) platform virtual environment</li> </ul>  <p>Create a new virtual machine in Hyper-V using the New Virtual Machine Wizard. Remember to create a virtual bridge to the internet.</p>	

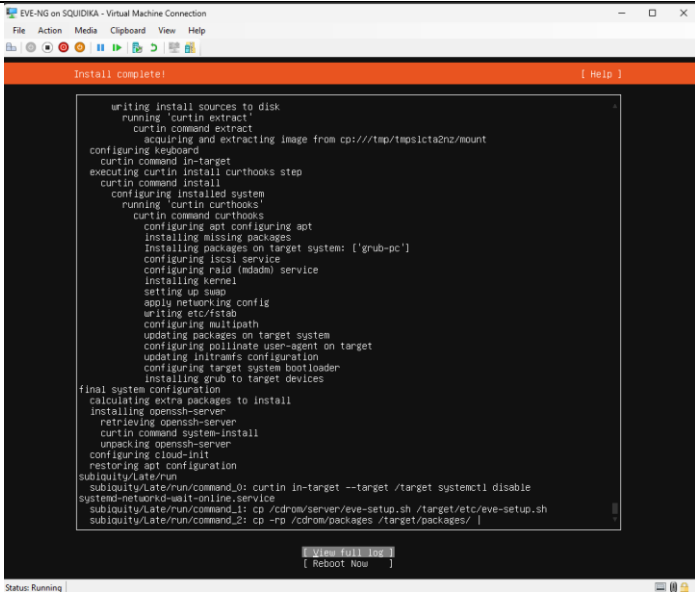
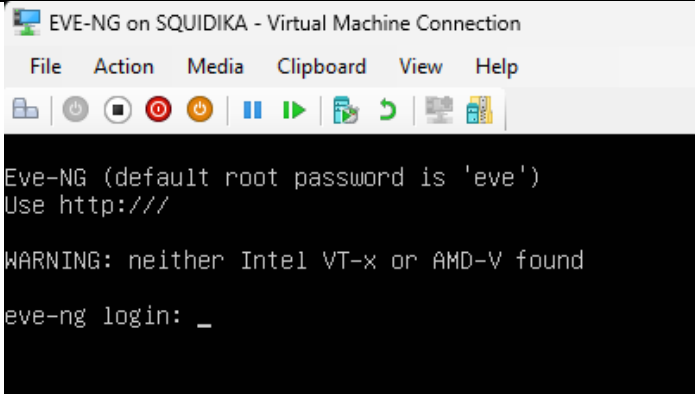


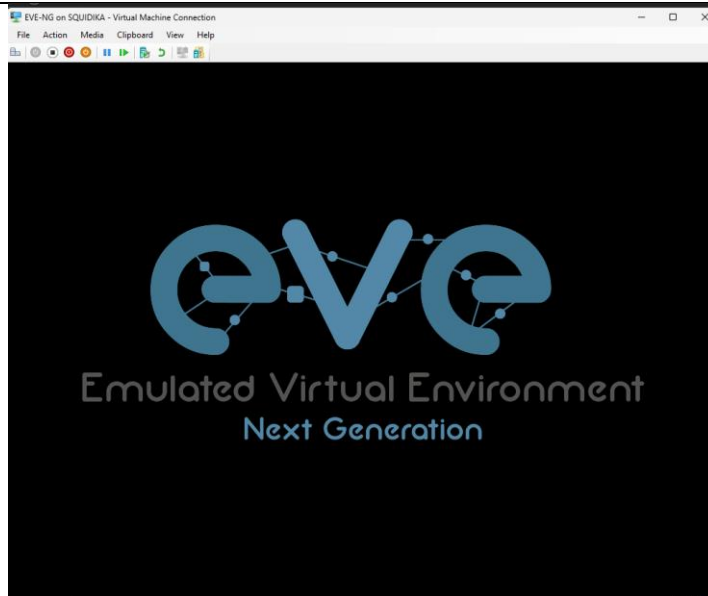
Mount the EVE-NG iso to the virtual disc drive.



Start the virtual machine and press install. Go through the prompts for installation.



	Select the partition created during the creation wizard. Select done.	
	<div></div> <p>Installation completes.</p>	
	<div></div> <p>Finish waiting for part 2 of installation to complete and wait for the default login to appear. Default eve-ng login – User: root Pass: eve</p>	
	When this is complete, set the new default user login, root pass and domain.	



Eve now loads into the command line.

```
Eve-NG (default root password is 'eve')
Use http://

WARNING: neither Intel VT-x or AMD-V found

eve-ng login: root
Password:
Welcome to Ubuntu 22.04.4 LTS (GNU/Linux 6.7.5-eveng-6-ksm+ x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Sun Nov 17 06:32:23 AM UTC 2024

System load: 1.25439453125   Memory usage: 19%   Processes:      162
Usage of /:  7.2% of 122.73GB   Swap usage:   16%   Users logged in: 0

Expanded Security Maintenance for Applications is not enabled.

47 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

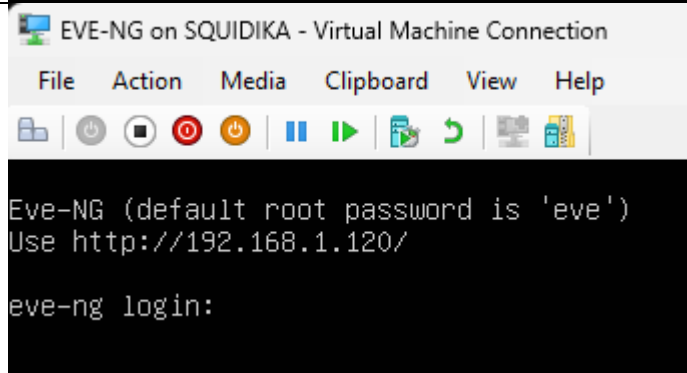
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings.

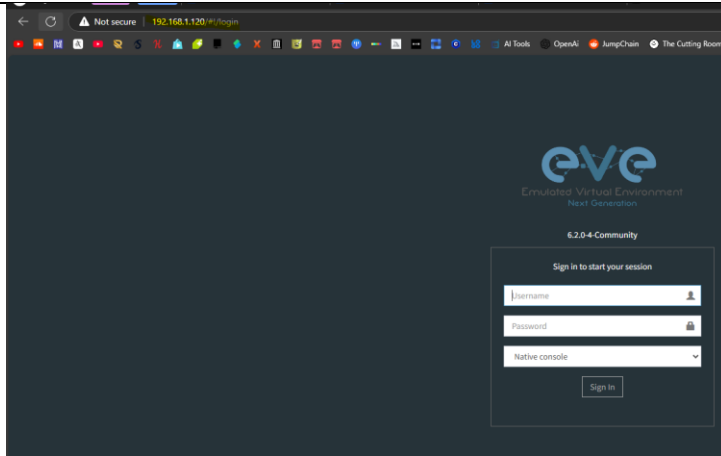
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

root@eve-ng:~#
```



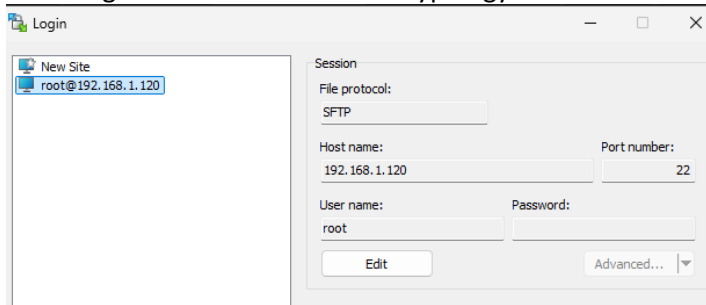
EVE-NG will boot, and use an ip address from the home routers dhcp and create a server we can log into using a browser.



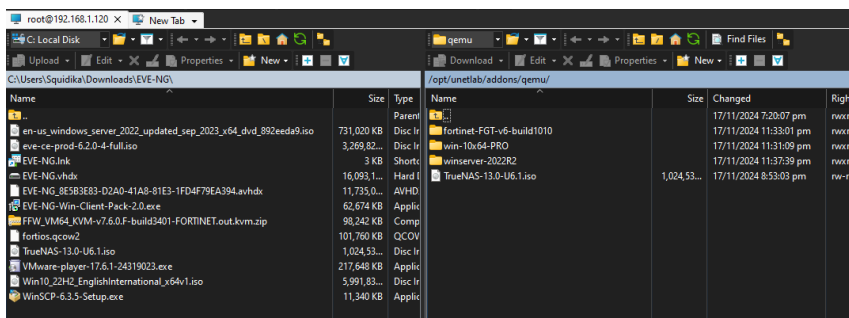
Use the ip address retrieved from the eve-ng image to get to the login page, where we can use the root we set to get into eve-ng.

- Create the required virtual nodes for the project:
  - Windows 10 Client, Windows server 2019, Fortigate firewall, TrueNAS (or FreeNAS) server

Use WinSCP to login to the EVE-NG server we have created, so that we can add images to the EVE-NG server typology.



Host name is root@(your eve-ng ip address), we can now save and login.



Navigate to the /opt/unetlab/addons/qemu/ path, this is where we store our images to build from in the typology.

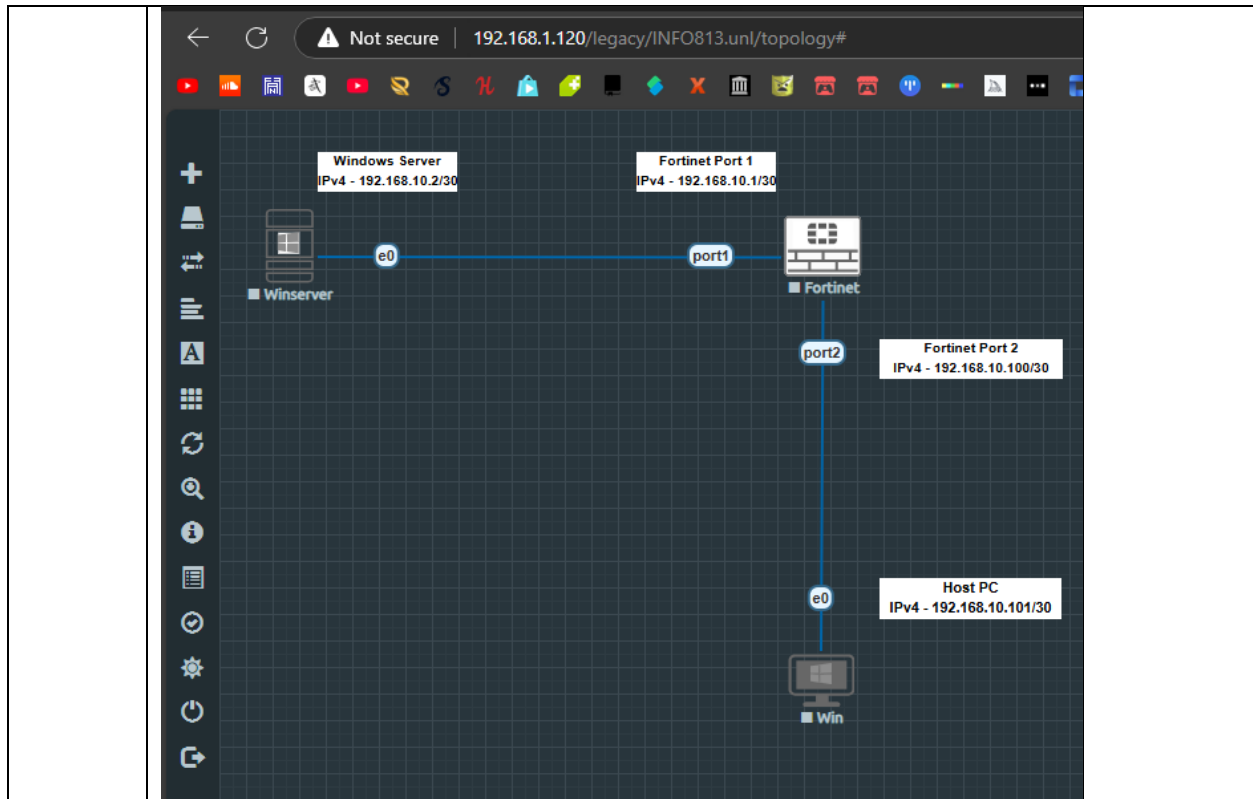
Transfer the images to the EVE-NG server. As described on the EVE-NG website, each image must be stored in a certain way.

[MS Windows Workstation -](#)

STEP 2

- Create the required virtual nodes for the project:
  - Windows 10 Client, Windows server 2019, Fortigate firewall, TrueNAS (or FreeNAS) server

	<div><p>The screenshot shows a network topology in EVE-NG. A 'Winserver' node is connected to a 'Fortinet' node via 'port1' on the Fortinet and 'e0' on the Winserver. The Fortinet node is also connected to a 'Win' node via 'port2' on the Fortinet and 'e0' on the Win node. The interface is a web browser at 192.168.1.120/legacy/INFO813.unl/topology#.</p></div> <p>Add the windows server, firewall and windows host to the typology now that they have loaded into EVE they will be available in the typology view.</p>	
	<ul style="list-style-type: none"><li>• Create an IP addressing scheme with Variable length subnet masking and set the IP address of the nodes accordingly.</li></ul> <p>Addressing scheme</p> <p>Network Address 192.168.10.0 255.255.255.0</p> <p>Fortinet = 192.168.10.1 255.255.255.0 port1 Winserver = 192.168.10.2 255.255.255.0 e0</p> <p>Fortinet = 192.168.10.100 255.255.255.0 port2 Win = 192.168.10.101 255.255.255.0 e0</p>	



List the three most useful Internet resources that you used (provided by the tutor)

- <https://youtu.be/y391y1pCDe0>
- [https://www.youtube.com/results?search\\_query=eve-ng+ubuntu+vm](https://www.youtube.com/results?search_query=eve-ng+ubuntu+vm)
- <https://winscp.net/eng/index.php>

List all (at least three) Internet resources that you found and used that were not provided by the tutor)

<https://www.eve-ng.net/index.php/download/>  
<https://www.youtube.com/watch?v=Okel1H93vNw>  
<https://www.eve-ng.net/index.php/documentation/howtos/howto-create-own-windows-host-on-the-eve/>

Reflect on at least two significant problems you came across during the implementation of this section and the solution you found. Use at least five sentence to describe each problem and five sentences to describe each solution. Demonstrate your critical thinking and problem-solving abilities.



Problem	Solution
EVE-NG not installing correctly.	Create a virtual bridge and assign it to the internet to allow the VM to install packages from the internet.
Nested virtualization must be enabled on the virtual machine.	Set-VMProcessor -VMName "EVE-NG" -ExposeVirtualizationExtensions \$True