**Diary Entry #1 – Week 2**

**NEXT WEEK**

Some things I would like to achieve next week include:

* Dual booting my laptop (Ubuntu / Windows 10)
* Install QEMU
* Explore and play about with the capabilities of QEMU

On top of these I will continue reading into the areas of technology associated with the project, as I do not yet feel equipped to discuss them in a tutorial-like capacity.

**Diary Entry #2 – Week 3**

**NEXT WEEK**

For the remainder of this week and next week I intend to achieve the following tasks:

* Get QEMU running on Ubuntu
* Explore network emulation on QEMU
* Complete my tutorial on getting started with QEMU

**Diary Entry #3 – Week 4**

**TASK PLAN**

(As a short-term note, I intend to spend a good deal of time next week exploring how this technology could be used, to make further entries in this section of the diary more comprehensive. Hopefully after attaining a better understanding of the technology’s potential, I will be able to create a much more concise and educated plan).

* One thing I have been thinking about is designing an intuitive front-end GUI for the QEMU system; particularly one tailored to creating VLANs and for users interested in the cyber-security side of things. I have only been making using of QEMU in its terminal form, and have thought that having a front-end would make the whole process a lot more wieldy. I am aware of existing front-ends for this, and will do some research into the pros and cons of each of these to try and discover where improvements could be made as this would make it useful to others.
* I also thought about including the Argos system in this front-end, however this is an area I will have to explore as stand-alone first.
* I would like to create a device, perhaps on a Raspberry Pi, that was capable of carrying out attacks on my virtual networks and pointing out weaknesses. In parallel, a tool like Argos for detecting these attacks and spotting where the weaknesses are from the attacked machine is something I could look at.
* I enjoyed the process of making the how-to guide, and will likely begin making others along the way if I encounter something where documentation is lacking again.
* I would also like to make some tutorial/explanation videos, as this is a media I find very helpful when trying to learn about new things and there are few videos online regarding QEMU and networking that I found to be of good standard.

**Diary Entry #5 – Week 6**

**TASK PLAN**

This week I feel like a gained a great deal more knowledge on where the task could possibly go. The Argos website mentions a new generation of honeypots to automatically identify and deal with zero-day worms and other attacks. The area of honeypots in general is something that interests me, however I have not done enough research or practical testing to be able to determine exactly what I could work on to make advancement in this area. I intend to discuss this at the next meeting, as I am feeling a little lost on how to make practical progress on the project (even after overcoming my current technical blip).

**Diary Entry #6 – Week 7**

**TASK PLAN**

The end-goal of this project is to have a piece of software or software-hardware configuration that can emulate the entirety of a prospective business or organisation's network. The tool would be designed for network admins, and should allow for all kinds of devices and servers to be emulated; a complete carbon-copy of the organisation's network so to speak. This could include built-in security testing features, such as penetration testing to allow the network admin to test the network without causing any real damage. This will involve the emulation of a VLAN, or private isolated network that is disconnected from the real-life network. This system should also provide system monitoring, to detect incoming attacks aswell as creating them. Any issues I encounter along the way will be documented, and I will provide walkthrough guides for the issues where they don't already exist so that others may have an easier time of creating the project.

Recent steps towards this goal include the successful creation of a VLAN, and short-term goals include getting the Argos tool working, which will allow for the network monitoring part of the system to be integrated.

**Diary Entry #7 – Week 8**

**TASK PLAN**

It is clear now that the initial end-goal of the project is not going to be achievable within the time-frame of the module (although I will likely continue working on the project after the expiry of this module). After doing some thinking and looking around, the most valuable output I can hope to have with the given time left is to construct a few more How-To guides in the areas of the project that I have been frequently finding under-documented. These areas include wireless bridge networking and isolated virtual networking. I will provide in-depth How-To guides in these areas, in the hope that if someone was to come and continue to work on my project they would be able to glide over all the issues I have encountered so far and go straight to making new ground.

The How-To guides will be written with a similar target audience to that of my blog post – people like myself who are complete beginners to virtualization. I chose this target audience as I feel that the current walkthroughs and documentation are far from ideal for this group, as within many of the articles some previous knowledge is assumed. This meant that I had to bring together the information from many sources in order to get something to work – a process I hope to relieve further developers of with my How-To guides.

I will continue to work on the technical side of the project where I feel it will help me write more in-depth guides; and time-permitting may work on towards the initial end-goal of the project mentioned in previous diary entries.

**Diary Entry #9 – Week 10**

**TASK PLAN**

This week I have realized that the most useful content I am likely to produce for others is to improve my existing How-To guide and blog post. Time permitting, I will endeavor to share a way of reading source code to others, however my focus will remain on my How-To guide and blog post. I have come to this decision as reading the source code of the Virt-Manager software has proved to be a more complicated task than I expected. I will also continue to update the social media account of the project, as well as make posts to appropriate sub-reddits. In the long-term I would still like to achieve the main goal of the project, however the scope of the university term simply doesn’t allow for it.

**SUMMARY OF COMPLETED WORK**

During the process of completing this project, my main useful contribution to others has been overcoming issues encountered near the beginning of the development process that are also applicable to many other project routes different to mine. Many of these issues are documented in my Daily Diary logs, and I have constructed potential forum posts to help others with these issues which can be found here. This work likely has the largest scope of potential developers to help, as it is from the very birth of the project and hence is quite generic, meaning others can apply it to their experience easily.

I have also created a comprehensive [How-To guide](https://github.com/bconnor270/ComputerScienceChallenges/tree/master/40260011_HowTo) on getting started with QEMU – something that I found the current information on to be fairly scattered. I collected information from a vast number of sources (listed here) and combined them into my How-To guide in order that other people would not have to go searching through the plethora of websites and forum posts that I had to in order to overcome what should have been simple problems. This is what took the majority of my time with this project, as I was actually completing the process myself and encountering all these issues first-hand; which means that all of my provided solutions are also tested first-hand. The How-To guide will be most helpful to those seeking to get started off with QEMU and KVM virtualization. I chose this audience as it was something that I personally struggled with at the beginning of the project and noted numerous times in my diary that I had to combine information from multiple different sources in order to achieve success. Within this guide I also deviated from the end-goal of the project in order to fill a gap of information I found online regarding [linking Wireless NICs to virtual machines](https://github.com/bconnor270/ComputerScienceChallenges/blob/master/40260011_HowTo/wireless.html) running on the host system. I hope that this deviation from the project path provides information of lasting value to others.

Furthermore I wrote a [blog-post](https://github.com/bconnor270/ComputerScienceChallenges/tree/master/40260011_BlogPost) documenting my experience with the project in order that others may continue from where I left off. Although I made little technical progress towards the end-goal of the project, the blog post takes readers through the initial stages and process of overcoming issues right from the offset – something that is valuable to others who are on different project paths to mine. This blog post was written with complete beginners to the area in mind – as I myself was a complete beginner not a few months ago.