Computer science co-op report

To: Sandra Stark From: Philip Dumaresq Date: August 22nd 2016 Confidentiality: Non Confidential

During the summer of 2016 I worked at Heritage College, a post-secondary educational institute, in a co-op position with the Computer Services department. Heritage college is known for being an Anglophone cegep in the Outaouais area. I worked with them from the 30th of May until August 19th, 2016. While working there, I was supervised by my boss, Marc Amey.

While working at Heritage, my main task was to help shift the majority of the school over to a VDI environment. A wide scale deployment of the new environment meant learning to use various different imaging software techniques while doing a lot of troubleshooting on both the hardware and software of the computers. We had to deploy VDI images on around 400 computers, so there was a lot to get done with those computers and then there was another several hundred computers we had to image that we’re still physical OSs. We we’re also largely in charge of getting the whole new wing up and running. Imaging all the computers in another room and then getting them ready to move over to the new wing, moving monitors, cables, etc. Deploying the labs and the classrooms was a larger part of the last week of work too. During my free time, or downtime that I had, I worked on a couple other side projects too. The main one that I was working on involved building a lightweight Ubuntu based operating system that the school could use to replace the windows PCs that the school had previously been working with. The idea was to have an OS that would automatically boot into the virtual environment for students and staff to be able to use. The Ubuntu OS meant that it would be a much lighter operating system that either the windows 7 PCs or even the Windows ThinPC systems that we had running. That way we could extend the life in some of the older machines that the school was running. There was a lot to do with this though since because the Ubuntu operating system presents a new user interface other than the Windows log on, I had to try and make it as obvious as possible to new users how to log on and prevent them from getting out of the log on UI. Make it so that the user had as little freedom in navigating Ubuntu as possible. With the UI active, it would be easy to get lost. The other side project that I was working on was attempting to make the imaging process a little faster by automating some of it. To dump an image, we have USBs that boot into a windows environment and then we just have to run an application that allows us to grab an image off the server and dump it onto the hard drive. I attempted to learn a little bit of batch scripting to figure out how to make the application get run as soon as the PC connected to the network and then automate key strokes to get it to run through the process of dumping the image. While I did end up getting most of it working, the project ended up getting cancelled partly due to security issues, partly because the USBs OS didn’t really permit it. Any files saved in the OS on the USB got deleted once you left it, so I decided it wasn’t worth the extra bit of time to get it to work.

During my time at heritage, I got the opportunity to use a lot of different things. For operating systems, I used a lot of windows based OSs, as well as some Linux based ones. I got to use Windows 7 for the most part since the whole school is running a windows 7 VDI environment and the windows ThinPC is essentially a lightweight Windows 7. I also used windows 8, Windows 10, and Windows server 2012 R2. Besides the Windows based operating systems, I got to used a couple different versions of Lubuntu, mostly 14.04. For the languages that I used, I got to use a little bit of batch scripting while trying to automate the imaging process, and I used a little bit of bash scripting while trying to configure the Lubuntu OS. While working on these, although I can’t say I used them to a point where I understood the language, I dug a bit through some XML files to modify basic UI in the Ubuntu interface, and I and wrote very short bits of VBscript while working on the automation. Neither of the languages I really used so much as modified pre-existing scripts, but I got myself a little bit of exposure to the languages. In terms of database management systems, I mostly used a lot of Active directory to add computers to certain folders so that the right group policies would apply to them. On that note, I also used a little bit of the group policy management software on Windows 2012 R2. Besides those, I got a lot of exposure to VMware products. We use VMware-Horizon-Client extensively for the school’s VDI environment and we use a lot of other products on the server side. Mostly I used VMware-Horizon-Client and learned about troubleshooting with their products. I got to use a lot of the VMware community support, which was useful to get used to since a lot of different companies have that for multiple products. I got to learn a lot about using VMware-Horizon-Client from the command line too since I spent a lot of time digging through the user manual online to figure out how to set certain things up on it.

In our hardware and operating systems course, from first semester, I can’t really think of any skills that I didn’t use during my co-op. I used everything from downloading Windows to using the disk management to understand the Northbridge and the Southbridge. While some of the skills I didn’t need on a deeper comprehensive level like we learned in our lectures, I used almost all of it. I ended up explaining the Northbridge and Southbridge to co-workers to explain why your RAM communicates so much faster with your CPU than your hard drive does. Because I was imaging computers as most of the job, I ended up downloading Windows more times than I’d like to count. Working on the Lubuntu operating system, I used most things from our portion on Linux, everything from changing permissions using chmod to learning more about user access and managing users. From our networking course, again, I used mostly everything. Adding computers to the school’s domain, using remote desktop connection, using active directory, all of these became daily tasks. I needed these skills so that I could understand the virtualized environment and work with it. When something stopped working, the tools that we could access remotely on the server became the key to getting things fixed. I also ended up using some of the more basic programming skills that we learned. While I didn’t use a lot of it, I used to basic understanding of programming to write bash a batch scripts for some of my side projects. I also used some of the batch scripting that I learned to try and translate some of the code that previous contract workers had written into bash script so that I could use it in the Ubuntu environment. While I didn’t use a lot of programming, I got to use it in some very cool and some different ways than we learned to use it in class. From our business information systems course, I also used a decent amount of what we learned. I ended up going onto Ubuntu and VMware forums to ask questions to people who are a bit more knowledgeable whenever I hit a road block in what I was working for side projects, so learning a little bit more about how to talk online with people in a more professional way was pretty useful, not to mention the fact that we used our email to communicate a lot. Knowing how to send a more professional email to our boss was nice to know, since it gives us a good image while we’re working there.

I ended up learning a lot of new skills while working at Heritage. While working with the VDI environment, I learned a lot about virtualization and the concepts behind it. I learned to appreciate the need to constantly be testing, something that I did a lot before, but less in a testing way, more of a “I hope everything works up to this point” kind of way. So testing all the small stuff was something I had to get used to. There’s a lot of small things that need to be checked constantly. While working with the Ubuntu configuration, I learned a lot about how Linux works in terms of how it builds file systems, how it determines where to save stuff, what it does with certain files, etc. I learned a lot about how Linux works and why Linux is so good to use. You can modify the source code to change pretty much anything you want to change about it, which is pretty amazing. I learned a bit about how to do bash scripting, which was really cool too since it’s super powerful. I also got slightly familiar with XML, I didn’t really use it so much as modify pre-existing code, but I learned a bit about it. While working on the imaging automation, I learned a lot about how useful automation is just in general. If the whole thing had worked, the entire process of imaging a computer would have been shortened a lot and everything would’ve been automatic, which would be really nice since we could plug in the USBs, boot them and then just wait, without having any other required work. It would’ve save a lot of time.

I feel as if I was incredibly well prepared for this co-op. throughout the entire summer I never felt like anything that someone asked me to do was something that would be way in over my head. The only thing I was unprepared for was when they asked me to work on the Ubuntu configuration as a side project, but I ended up figuring it all out as I went along and ended up learned what I was doing. I can’t really think of anything that would’ve made me more prepared for the co-op. The only issue that I really had the whole time was not knowing how to say certain things in French, which was kind of awkward from time to time. If we took some time in school to learn some of the French terms for things, that would’ve been nice, but it also would be difficult to give us like a Computer Science specific French class, so it’s something that would be a little harder to prepare us for. I can’t really think of anything that would improve the co-op either. It would’ve been nice to learn a little more programming stuff, getting to help the audio visual department maybe, but it’s also an entirely different job, so it’s not like I would’ve gotten to really work on it at all. But even getting to use Windows PowerShell a little more would’ve been cool since PowerShell is really powerful and we only got a little bit of exposure to it. I think overall, the best part of the co-op was just getting to work with the people in the computer services department. They’ve all been together for a long time, so getting to work with them all was really nice because they’re all very comfortable with each other and they all like to be relaxed, even though there was always a bunch of work to get done. They we’re really fun to work with.

In conclusion, the whole co-op experience was really amazing. I got to use a lot of skills that we learned in class, and we learned a lot of new skills relevant to different fields. We got to use a lot of different types of systems, both Windows based and Linux based, plus we got to use the server operating systems a lot. I got to code a little bit, which I really enjoyed, even if it would’ve been nice to have gotten to do it a little bit more.