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Student Declaration

1. I have accurately identified and included the sources of all facts, ideas, opinions, and viewpoints from others in the assignment references. All direct quotations, paraphrasing, and discussions of ideas from books, journal articles, internet sources, course materials, or any other sources used are properly acknowledged and cited in the assignment references.
2. I have not used unauthorised artificial intelligence tools or aids.
3. I understand and am compliant with ATU's policy and procedures regarding Academic Integrity and I am aware of the consequences of any violations.
4. I have followed the referencing guidelines recommended in the assignment instructions and / or programme documentation.
5. By signing this form or by submitting material online I confirm that this assignment, or any part of it, has not been previously submitted by me or any other person for assessment on this or any other programme of study.
6. By signing this form or by submitting material for assessment online I confirm that I have read and understood [AQAE022 Academic Integrity Policy](https://atlantictu.sharepoint.com/sites/PoliciesProcedures/AQAE%20Student%20Documents/Forms/AllItems.aspx?id=%2Fsites%2FPoliciesProcedures%2FAQAE+Student+Documents%2FAQAE022+Academic+Integrity+Policy.pdf&parent=%2Fsites%2FPoliciesProcedures%2FAQAE+Student+Documents)

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| **Student Signature** | **Date** |
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# Description

**A narrative introducing and describing the work documented in this report. This should be worded like an abstract in a conference paper and serves the same purpose. An abstract is usually ≤ 300 words. 2 sentences or more but no more than a paragraph.**

To connect to virtual machines in a data centre requires we have a virtual machine setup up with software installed. In this technical report we describe the setup and configuration tasks to create a windows virtual machine to be used as a jump server. We install and setup the following software and tools Python, Git and Github desktop, Notepad++, Visual Studio Code, Putty and WinSCP on a windows host machine. We also perform virtual machine cloning of a gold ubuntu image, and install and setup Python, OpenSSH server, Git and GitHub desktop and Visual Studio Code .

# Aims

**A short narrative followed by a numbered list of the individual aims which this report intends to address, as full sentences. Do not use bullet points, number your aims.**

The primary aims of this work is to install software and setup software on the host machine and create a virtual machine which will have the basic minimum necessary software installed and setup to be used as a “jump” server.

This will require the installation, setup and testing of the following on a windows host computer:

1. Install and setup the currently latest version of python
2. Install and setup Git and Github
3. Install Notepad++
4. Instal Visual Studio Code
5. Install Putty and WinSCP

It will also require the installation, setup and testing of the following on a Ubuntu virtual machine:

1. Clone an ubuntu gold image
2. Python
3. OpenSSH Server
4. Git and GitHub desktop
5. Visual Studio Code

# Method

**Briefly introduce the section, state what equipment/systems you used for the work and the overall duration.**

**This section should contain the sequential steps which are required to carry out each of the tasks required to meet the aims. Some technical work is procedural in nature, this can be summarised to a reference to a best practice or formal procedure, but such a summarization must be fully referenced. Some technical work is investigational, and you may be experimenting to find the best steps. In this case, you need to clearly identify all the steps taken and the rationale. If method requires more than one diagram per page, these diagrams should be individually labelled, be included in appendix A, and referenced from here.**

**The method section of a report should allow a peer to recreate the work entirely.**

In this section of the report steps will be shown in sequence to repeat the work

To setup the windows host machine the following were done

## Install Python on host machine

To install python on the windows host machine.

1. Download the python install manager from the python website [1].
2. Run the installer.
3. Select Yes to add python to the windows path

## Install Git host machine

To install Git goto git download for window page [2], click button for the standalone installer “Git for Windows/x64 setup”

Open the installer, agree to the license by choosing install

Keep the defaults when choosing which components should be installed.

Select Use Visual Studio Code as Gits default editor

For adjusting the name of the initial branch in new repositories choose let get decide

For adjusting your PATH environment, select Git from the command line and also 3rd party software

For choosing the SSH executable, use bundled OpenSSH

Choosing HTTPs transport backend, use the OpenSSL library

For Configuring the line ending conversions, select Checkout Windows-style, commit Unix-style line endings

For Configuring the terminal emulator to use with Git Bash select Use MinTTY

For default behaviour of “git pull” choose fast-forward or merge

Choose a credential helper select use Git Credential Manager

Choose Enable file system caching for Configuring extra options

Then choose Install

## Install GitHub on host machine

To install Github Desktop go to the github desktop downloads webpage [3] click the Download for Windows 64 bit button.

Run the installer

Select sign-in to github.com,

then choose authorise GitHub Desktop access to GitHub account

then for configure git keep defaults of use my GitHub account name and email address then select finish

## Install Notepad++ on host machine

To install Notepad++, go to the Notepad++ downloads page [2].

Download and run the latest version’s installer, which currently is version 8.8.6. Select yes, and agree to terms and conditions.

## Install Visual Studio Code on host machine

To install visual studio code on windows go to the visual studio code downloads page [3] and download the windows installer.

Then run the installer and accept the licensce agreement

In the installer for select additional tasks keep the defaults, select next then click install.

## Install Putty on host machine

To download putty go to the putty website [4] and select download putty this will bring you to the downloads webpage [5]. Select the appropriate windows installer I choose 64-bit x86. Run the installer, first choose where the files will be installed and then press next. For product features keep the defaults and select install

## Install WinSCP on host machine

To install WinSCP go to the winscp downloads page [6]. Click on the download winscp 6.5.4 green button. WinSCP will start downloading automatically, after downloading choose to install.

First choose to install for all users which is the recommended install mode.

Accept the licence agreement, and choose the recommended typical installation.

Choose commander interface style

To check RDP not via VMWare Workstation

1. We got ubuntu virtual machines ip address using ip addr show, it was assigned 192.168.125.135/24
2. To enable RDP in ubuntu we must install xrdp, this is done by:

sudo apt update

sudo apt install xrdp -y

1. Then we must enable and start xrdp

Sudo systemctl enable xrdp

Sudo systemctl start xrdp

1. GNOME on Wayland doesn’t work well with xRDP so we must from xRDP to Xorg with a compatabile desktop. This is done by uncommenting the WaylandEnable=false in the file /etc/gdm3/custom.conf then we enable and restart xrdp  
   sudo systemctl enable xrdp

sudo systemctl restart xrdp

1. Open Remote Desktop Connection, choose Xorg, enter the username and password for the Virtual Machine and click connect, a remote desktop window will open showing ubuntu.

A computer screen shot of a mouse

AI-generated content may be incorrect.

Figure 1 - Remote Desktop Connection to Ubuntu Virtual Machine

## Install Python on Ubuntu virtual machine

To install python on the ubuntu virtual machine we used the APT installer, the following operations were done:

1. First, we updated the list of available packages using
   * sudo apt update
2. Then we executed the upgrade command using the following:
   * sudo apt upgrade
3. Then we instructed ubuntu to install python version 3.11 which is currently the latest version.
   * sudo apt install python3.11

## Install OpenSSH on Ubuntu virtual machine

To install OpenSSH

1. in the terminal enter sudo apt install openssh-server
2. To test the openssh we used the command sudo systemctl status ssh

## Install Git and GitHub on Ubuntu virtual machine

To install git on a Debian based machine such as Ubuntu we use the following command

* + Sudo apt-get install git-all , this was found on the git website [1]

To install github

I used the APT package feed @mwt by using the following command.

wget -qO - https://mirror.mwt.me/shiftkey-desktop/gpgkey | gpg --dearmor | sudo tee /usr/share/keyrings/mwt-desktop.gpg > /dev/null

sudo sh -c 'echo "deb [arch=amd64 signed-by=/usr/share/keyrings/mwt-desktop.gpg] https://mirror.mwt.me/shiftkey-desktop/deb/ any main" > /etc/apt/sources.list.d/mwt-desktop.list'

After configuring the APT package feed I ran the following command to install the github desktop application

sudo apt update && sudo apt install github-desktop

## Install Visual Studio Code on Ubuntu virtual machine

To install visual studio code, I went to visual studio code website [2] and downloaded the latest version of visual studio code for ubuntu/Debian version. In the terminal I then navigated to where this file was stored and used the command the following command where <file> is the downloaded file’s name.

sudo apt install ./<file>.deb

Connecting using SSH via putty

A screen shot of a computer

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Connecting via WinSCP

A screenshot of a computer

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# Results and Testing

**Briefly introduce the section and define the tests which are performed.**

**The results of the work must be presented here in an appropriate form. Any filtering or removal of data must be declared and explained. If a system is being created, the test procedure and result must be given. If many tables or diagrams are required, these diagrams should be individually labelled, included in appendix B, and referenced from here.**

**The results/testing section of a report should allow a peer to replicate and verify the results obtained.**

**Number every figure or table. Do not include any figure or table which you do not discuss.**

This section of the report defines the tests which were performed and their results

1. Verify the snapshots performed as specified in method
2. The following tests were carried out
   1. Took a snapshot and verified it, see appendix, figure 3
   2. Rolled back the snapshot and verified it, see appendix 1, figure 4

To verify Python was installed successfully we entered the python3 console and executed a print command to ensure currently installed version of python works on the virtual machine, see figure 1.

A screenshot of a computer

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Figure 2 - Testing Python on host machine

To verify Git was installed we did a basic check to see what version was installed, see appendix figure 2, we can see the git window opens and shows a shell prompt.

To verify that GitHub desktop was installed successfully and is correctly connected to the users GitHub account, GitHub Desktop was opened, and we can see GitHub Desktop lists the repositories in the connected users GitHub Account.

A screenshot of a computer

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Figure 3- GitHub Desktop on Windows

A screenshot of a computer

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Figure 4- Verifying GitHub Desktop in Linux

To verify that Notepad++ is installed and can be executed, Notepad++ was run and a text file was opened.

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Figure 5 - Notepad++ Screenshot verifying it runs

To verify visual studio code was installed correctly on the windows host machine a screenshot of it running is included in figure 5.

A screenshot of a computer program

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Figure 6 - Visual Studio Code on Windows Host Machine

To verify Putty was installed and operates correctly we can see in the next 2 figures the Putty Configuration window that is displayed when running Putty.

A screenshot of a computer

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Figure 7 - Putty Configuration Window

In figure 7, we can see that a connection is successfully made from the host to ubuntu virtual machine.

A screenshot of a computer program

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Figure 8 - Putty Terminal Screenshot

In figure 8, we can see WinSCP correctly connected from the host windows machine to the Ubuntu virtual machine.

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Figure 9 - WinSCP Commander Interface

The results of installing python on the ubuntu virtual machine can be seen in the appendix, figure 11. Here we open the python console, and get it to print a message which is successful and then we exit the python console.

The results of installing OpenSSH Server are shown below

A screenshot of a computer

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Figure 10 - OpenSSH Server Status

We can see that OpenSSH is “active (running)”: This status indicates that the Ubuntu SSH service is currently running. We also can see its enabled “preset: enabled”: Look at the “Loaded” line and search for the entry “preset: enabled.” It indicates that SSH will be available at every system restart.

To verify that git is installed correctly, the version was checked in the terminal and we cloned the IaC repository from GitHub.

A screenshot of a computer

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Figure 11 - Checking the installed Git Version on Virtual Machine

Github desktop was shown to be installed and setup correctly on the virtual machine as it runs and we can see the repositories associated with the users account

A screenshot of a computer

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Figure 12 - Executing GithHub Desktop on Virtual Machine

To verify visual studio code is installed correctly we ran the program.

A screenshot of a computer

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Figure 13 - Verifying Visual Studio Code runs on Ubuntu Virtual Machine

# Conclusions

**It should be confirmed if the aims have been met, based on the results or testing. Evidence of independent research should be provided and cited from the text. The conclusion should show an understanding of why the work was significant. Most marks go for the conclusion, this section should be substantial.**

Most marks, set out with aims these are the results I got, I achieved/didn’t achieve my aims. Level 9 show me a bit of background reading. Look at what a snapshot/clone etc give reference

We successfully installed and configured all the required software necessary for the host machine and ubuntu virtual server. We now have a basic “jump server” which has the necessary tools and software installed. In the results section we verified that all the software was installed correctly and executes.

We installed python which is a versatile scripting programming language, We installed git and github for version control and syncing of local and remote git repositories. Notepad++ is a text editor which can be used to convert windows text file encodings to linux text file encodings and vice versa. We also installed Visual Studio Code, which is a code editor that will allow us to write scripts and programmes and also execute them in a built in terminal. WinSCP stands for Windows Secure Copy it’s a free and open-source tool for secure file transfer between a Windows computer and a Linux computer. OpenSSH Server stands for Open Secure Shell it is a secure networking service that connets to systems remotely using the Secure Shell (SSH) protocol.

The Remote Desktop Protocol, Secure Shell Server and WinSCP was also found to allow communication between the host and the VM. Github is now synced locally and remotely. We can now transfer files between these machines and use Git and Github for version control.

This assignment improved my understanding of environment configuration, remote management, and version control integration. For future work, we now have a host machine and ubuntu virtual machine which can be used and expanded on for further work.

# References

Any external research referenced should be documented here, in an accepted format. The Institute standard is Harvard, I prefer IEEE referencing for short papers and reports. Either is acceptable but be consistent.

|  |  |
| --- | --- |
| [1] | [Online]. Available: https://www.python.org/downloads/. |
| [2] | [Online]. Available: https://git-scm.com/downloads/win. |
| [3] | [Online]. Available: https://desktop.github.com/download/. |
| [4] | [Online]. Available: https://notepad-plus-plus.org/downloads/. |
| [5] | [Online]. Available: https://code.visualstudio.com/download. |
| [6] | [Online]. Available: https://putty.org/index.html. |
| [7] | [Online]. Available: https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html. |
| [8] | [Online]. Available: https://winscp.net/eng/download.php. |
| [9] | [Online]. Available: https://git-scm.com/book/en/v2/Getting-Started-Installing-Git. |
| [10] | [Online]. Available: https://code.visualstudio.com/download. |

# Appendices

Each The appendix will contain numbered and labelled diagrams and tables. You must cite any figure or table from the text of the report.

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Figure 14 - Testing Git was installed successfully

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Figure 15 - Python Console

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Figure 16 - Testing Installed Git Version