WINDOWS 10 SSH DOCUMENTATION

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Configuring SSH keys

With changes being made to Windows 10, it is possible to use a built in SSH client which can be accessed using Windows Command Prompt or PowerShell. You can verify your installation using "ssh -V" in your PowerShell session. This can be seen in Figure 1.

Figure 1: Verification of SSH install

It is then possible to create SSH keys using the built-in Windows 10 SSH client, there is no requirement for further installations of WSL (Windows Subsystem Linux), PuTTY or any other SSH based software. SSH keys can be generated identical to Windows using "ssh-keygen" this can be seen in Figure 2.

Figure 2: SSH key creation

Upon attempting to generate the key, you'll be prompted to save the key in a desired location, if you are happy to keep the generated SSH key in your main user directory; then press ENTER. Next you'll be prompted for a passphrase. Without a passphrase, your SSH key is not protected in the event of it being stolen by a third party.

This means any systems on the internet which you authenticate via public key authentication will allow an attacker to infiltrate these systems without the additional challenge of a passphrase. It is strongly recommended a passphrase is configured to maintain high standards of security to protect your account and the COSMA infrastructure.

Once the passphrase is submitted, there will be a public/private key pair generated. The public key must now be submitted to SAFE which will allow COSMA Support to add the key to your account. You must now wait at least 5 minutes ensuring that the SSH key propagates through the COSMA cluster. Attempting to login within the first 5 minutes of a key being approved results in permission denied errors, eventually leading to the account triggering internal security defences which being block your account from logging in for a set period of time.

```
PS C:\Users\Aqeeb Hussain\.ssh> ssh dc-huss1@login7.cosma.dur.ac.uk
The authenticity of host 'login7.cosma.dur.ac.uk (193.60.196.21)' can't be established.
ECDSA key fingerprint is SHA256:wpzwRdJn6QYp1EgkGrPOkMz6R6ZJBsY3Cj2bRdnQRJQ.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'login7.cosma.dur.ac.uk,193.60.196.21' (ECDSA) to the list of known hosts.
Enter passphrase for key 'C:\Users\Aqeeb Hussain/.ssh/id_rsa':
Last login: Tue Oct  5 13:11:53 2021 from controller.cosma.dur.ac.uk
Welcome to COSMA!

You are on a COSMA7 login node.  Please use this responsibly.  Do not start
any long-running jobs directly (submit to the batch queue instead), and do
not run processes which hog CPU.

For more information, please see https://www.dur.ac.uk/cosma

   COSMA TIP:
Setting a realistic run-time in your SLURM batch script may increase your
chances of slipping in early

[dc-huss1@login7a [cosma7] ~]$
```

Figure 3: SSH initial login

Upon your first login seen in Figure 3, you will be prompted to continue connection, entering your passphrase which should lead to successful connection into the COSMA cluster as seen in Figure 4.

Configuring SSH Agent

```
PS C:\Users\Aqeeb Hussain\.ssh> ssh dc-huss1@login7.cosma.dur.ac.uk
Warning: Permanently added the ECDSA host key for IP address '193.60.196.22' to the list of known hosts.
Enter passphrase for key 'C:\Users\Aqeeb Hussain/.ssh/id_rsa':
PS C:\Users\Aqeeb Hussain\.ssh> ssh dc-huss1@login7.cosma.dur.ac.uk
Enter passphrase for key 'C:\Users\Aqeeb Hussain/.ssh/id_rsa':
PS C:\Users\Aqeeb Hussain\.ssh>
```

Figure 4: Passphrase required every SSH login attempt

When attempting to make any further connections to COSMA, you may still be get prompted for your SSH key passphrase. To avoid this, you can make use of ssh-agent.

To configure ssh-agent: Start a new PowerShell session as an administrator on your machine.

When the administrator session has been started, enter the following command:

`Get-Service ssh-agent | Set-Service -StartupType Manual`

This command will retrieve the ssh-agent binary installed on the Windows 10 installation and will set the service to be started manually.

Now the process is required to be started using "Start-Service ssh-agent". To check the executable is running you can run Get-Service ssh-agent which should return the following output as seen in Figure 5.

```
PS C:\Windows\system32> Start-Service ssh-agent
PS C:\Windows\system32> Get-Service ssh-agent

Status     Name               DisplayName
------     ----               -----------
Running    ssh-agent          OpenSSH Authentication Agent
```

Figure 5: Starting SSH Agent (Administrator Shell)

The next step is to add your SSH key using the command of "ssh-add" as seen in Figure 6.

```
PS C:\Windows\system32> ssh-add 'C:\Users\Aqeeb Hussain\.ssh\id_rsa'
Enter passphrase for C:\Users\Aqeeb Hussain\.ssh\id_rsa:
Identity added: C:\Users\Aqeeb Hussain\.ssh\id_rsa (aqeeb hussain@DESKTOP-R2EPEJG)
PS C:\Windows\system32>
```

Figure 6: Adding SSH key to agent (Administrator Shell)

You can specify the path to your directory using the '~' symbol followed by the path of /.ssh/(Name of private key). If your SSH key has a passphrase (which it should have when accessing COSMA) you will be required to authenticate your SSH key. At this point, the identity is added into the ssh-agent on your Windows 10 machine allowing for SSH access without using a passphrase each time.

Dropping into a PowerShell user session, SSH access can now be established without having to re-enter SSH passphrase seen in Figure 7.

```
PS C:\Users\Aqeeb Hussain> ssh dc-huss1@login7.cosma.dur.ac.uk
Last login: Mon Oct 11 10:48:16 2021 from 129.234.0.212
Last login: Mon Oct 11 10:48:16 2021 from 129.234.0.212
Welcome to COSMA!

You are on a COSMA7 login node.  Please use this responsibly.  Do not start
any long-running jobs directly (submit to the batch queue instead), and do
not run processes which hog CPU.

For more information, please see https://www.dur.ac.uk/cosma

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[dc-huss1@login7a [cosma7] ~]$
```

Figure 7: SSH Agent Based Connection