PuTTY Passwordless SSH Connection

In this tutorial, I will demonstrate how to create a passwordless SSH connection from my Windows 7 host system to a CentOS 7 virtual machine.

I will be using **PuTTYgen** to generate my SSH key pair and **PuTTY** to remotely connect to my CentOS 7 VM.

Please note that I will be using a virtual machine that was created in my other tutorial, **CentOS 7 Server Install**, accessible **here**.

Prerequisites

- VirtualBox VM with a CentOS 7 minimal installation
- PuTTY & PuTTYgen (can be downloaded here)
    - **PuTTY**: A client for managing SSH sessions
    - **PuTTYgen**: A tool for managing and creating SSH key pairs
- Active Internet Connection

For instructions on how to install VirtualBox and extension pack, see my **VirtualBox Install** tutorial **here**.

If you do not already have a virtual machine, with a minimal install of CentOS 7, my other tutorial can be accessed **here**.

Steps to complete tutorial:

Take Pre Passwordless SSH Snapshot

The reason I want to take a snapshot, before we begin, is that we will be making a number of major changes to the virtual machine. After successfully completing a major change, I find it helpful to create (take) a snapshot to act as a fallback mechanism. If something goes wrong during a major change, we can revert back to a working snapshot (previous stable state).

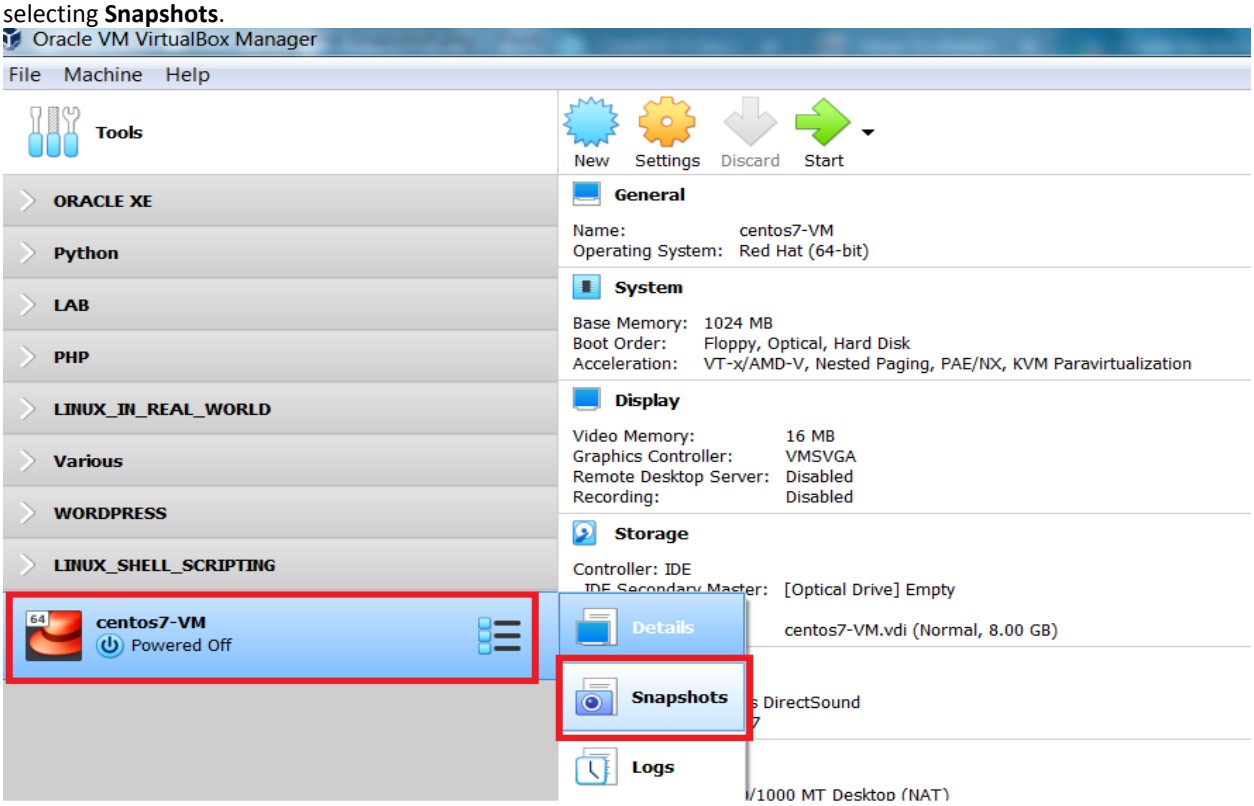
If you've completed my **CentOS 7 Server Install** tutorial, accessible here, then, you've already taken a snapshot (**POST-CentOS7-MINIMAL-INSTALL**) and can skip to the next step (Download PuTTY & PuTTYgen).

If you already have a CentOS 7 minimal install VM. I suggest taking a snapshot before continuing with the tutorial, to ensure that you have a starting point to revert back to.

Please note that you can name the snapshot whatever you like, just remember which snapshot is associated with which state of the virtual machine.

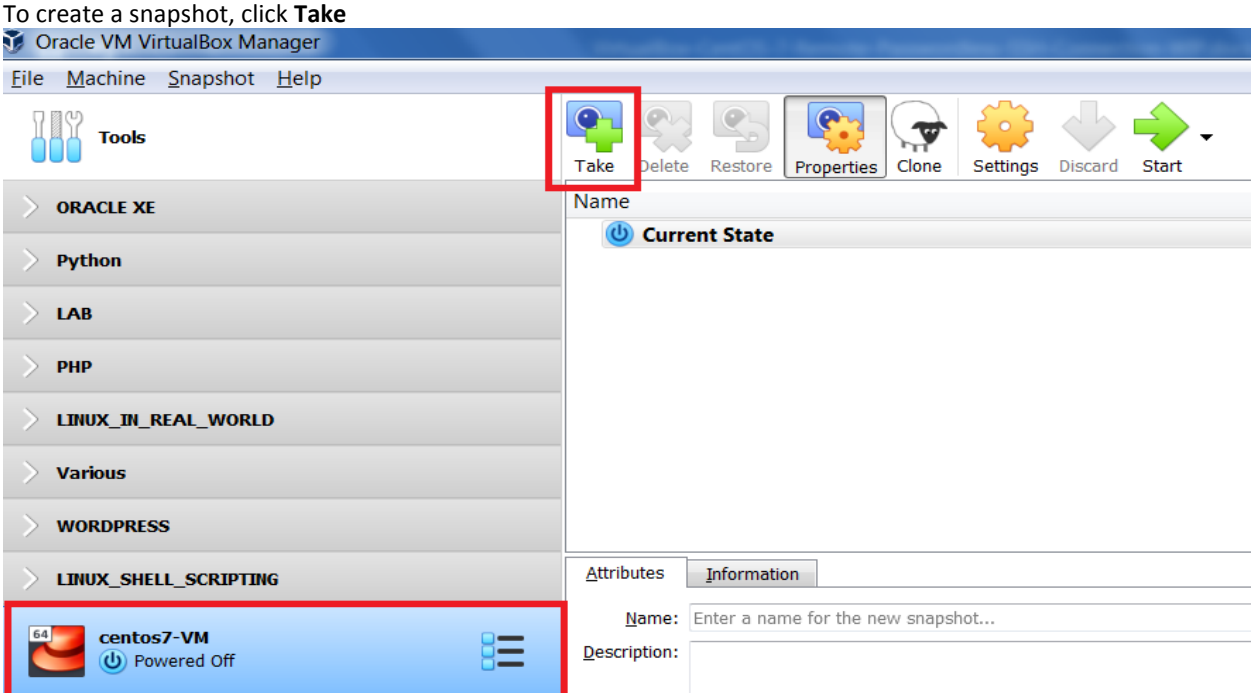
From the VirtualBox Manager interface, ensure your VM is selected and that you are in "**Snapshots**" view.

If you are in **Details** view, switch to **Snapshots** view, by clicking the list icon next to the virtual machine name, and selecting **Snapshots**.



The **Snapshots** view will show you a listing of the snapshots created for the virtual machine.

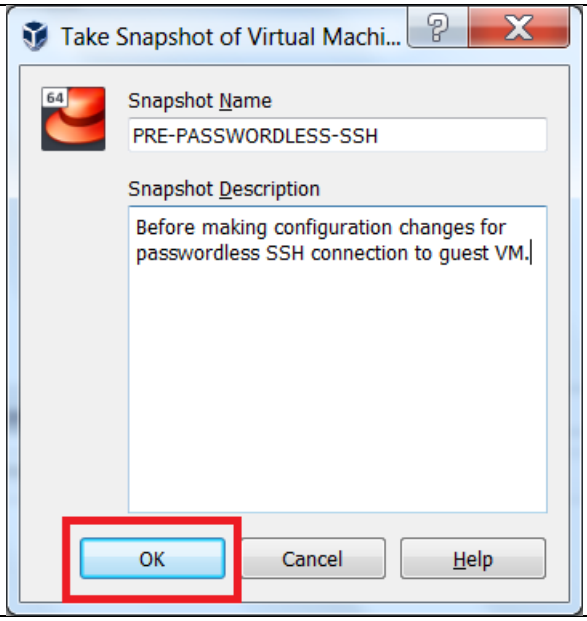
To create a snapshot, click **Take**



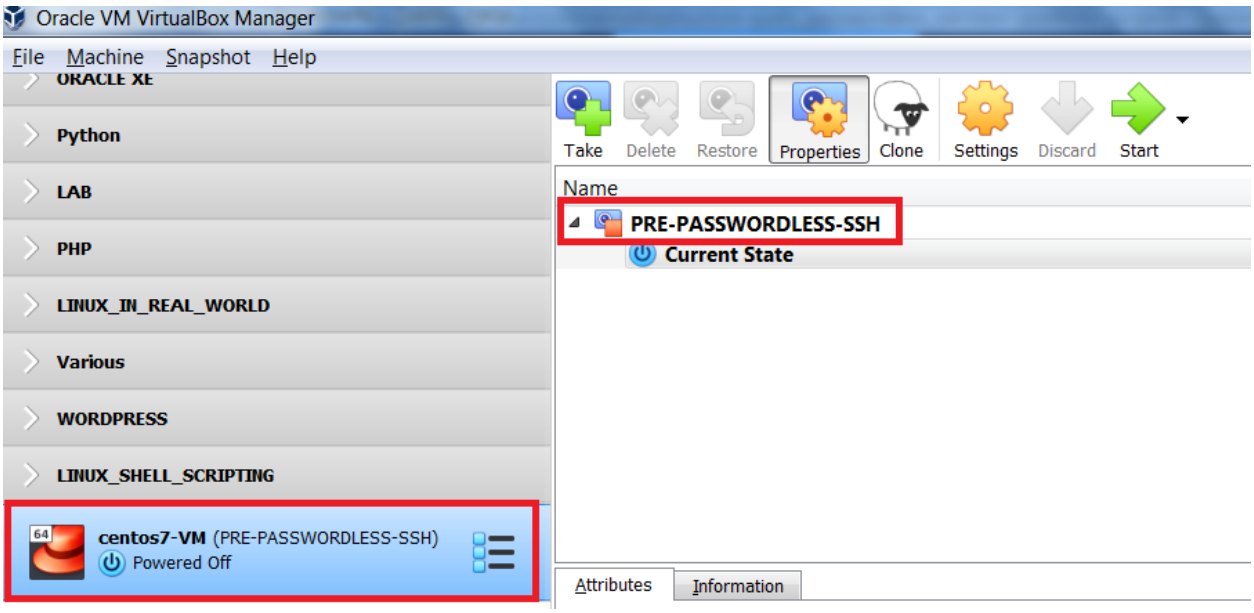
Enter a name for the snapshot, as well as, a short description, then, click **OK**

I've taken a snapshot "**PRE-PASSWORDLESS-SSH**" to ensure that I have a starting point to revert back to, if needed.

Before starting, and configuring, the VM, we will download the required tools, PuTTY & PuTTYgen, needed to complete this lab.
PuTTYgen, to generate the SSH key pair.
PuTTY, to make the passwordless SSH connection to our VM.

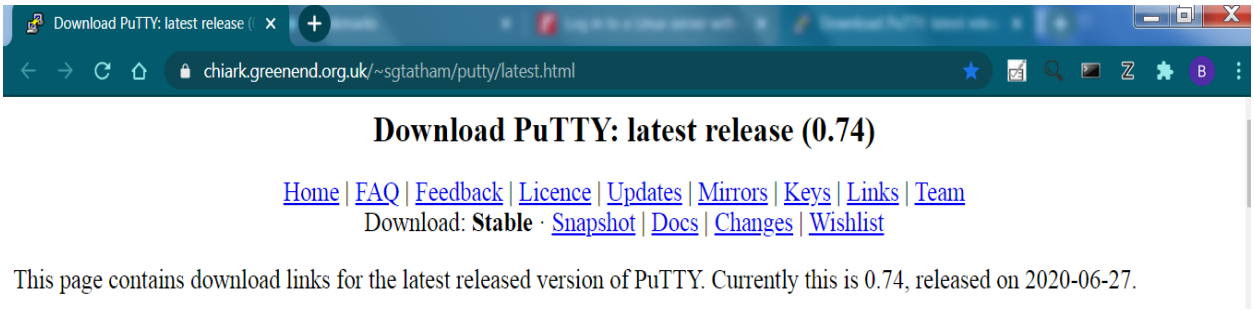


We have successfully created (taken) a snapshot and can now download the required tools.



Download PuTTY & PuTTYgen

For both the PuTTY & PuTTYgen tools, go to the following link [Download latest](chiark.greenend.org.uk/~sgtatham/putty/latest.html).



Scroll down to "**Alternative binary files**" and download the standalone binaries (portable versions – no installation required) for **PuTTY** & **PuTTYgen** that correspond to the bit version of your system (32-bit or 64-bit).
I will be downloading, and using, the 64-bit portable versions. If you are using a 32-bit system, please download, and use, the 32-bit portable version of **Putty** & **PuttyGen**.

Alternative binary files

The installer packages above will provide versions of all of these (except PuTTYtel), but you can download standalone binaries one by one if you prefer.

(Not sure whether you want the 32-bit or the 64-bit version? Read the FAQ entry.)

putty.exe (the SSH and Telnet client itself)

32-bit:	putty.exe	(or by FTP)	(signature)
64-bit:	putty.exe	(or by FTP)	(signature)

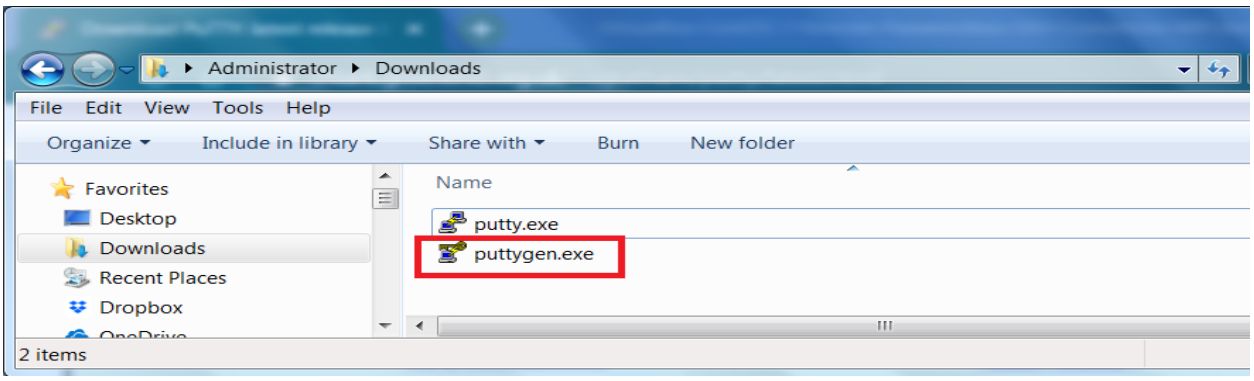
puttygen.exe (a RSA and DSA key generation utility)

32-bit:	puttygen.exe	(or by FTP)	(signature)
64-bit:	puttygen.exe	(or by FTP)	(signature)

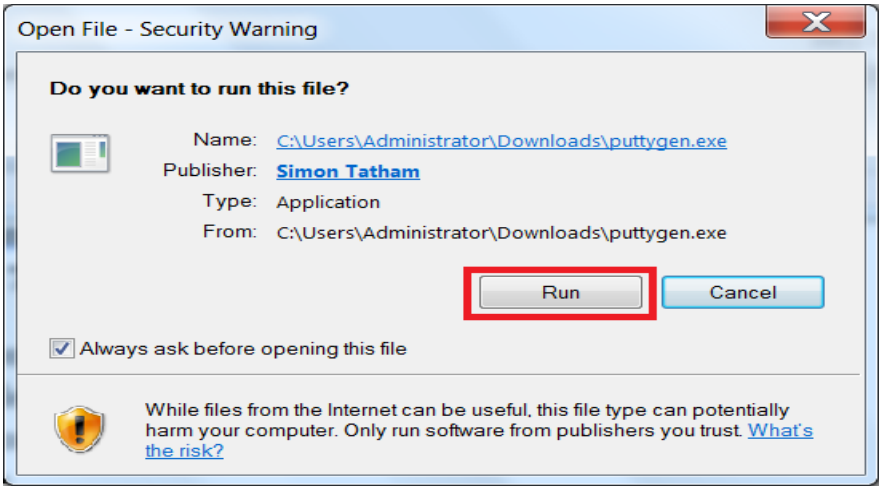
Once the tools are downloaded, we are ready to begin.

Generate SSH Keypair using PuttyGen

From your system's download location, launch the PuTTY Key Generator by double-clicking **puttygen.exe**.

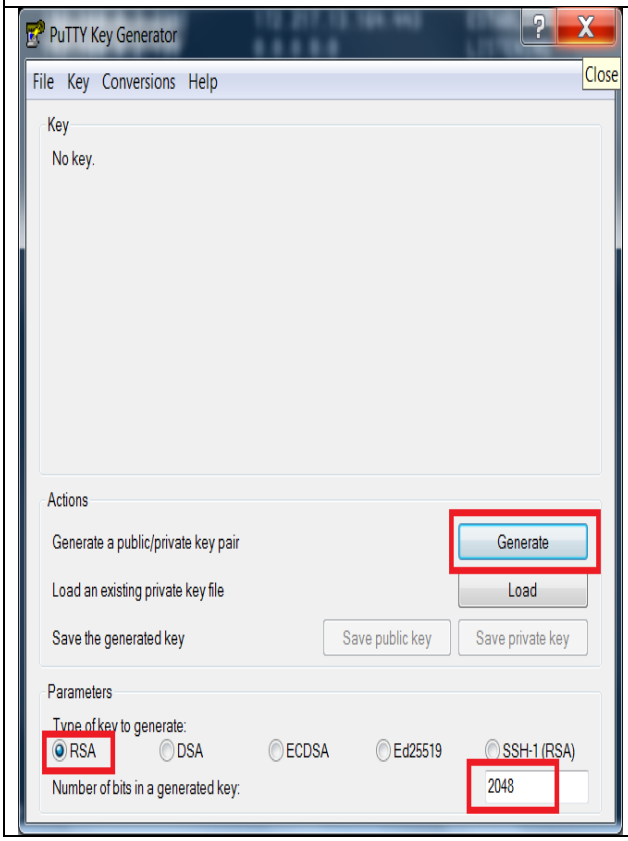
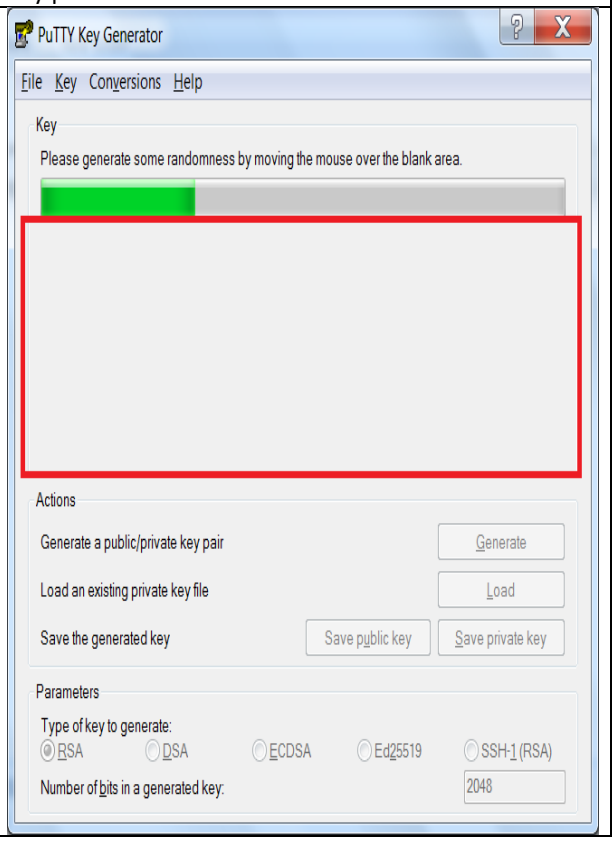


If you are prompted to accept a security warning to continue, click **Run**

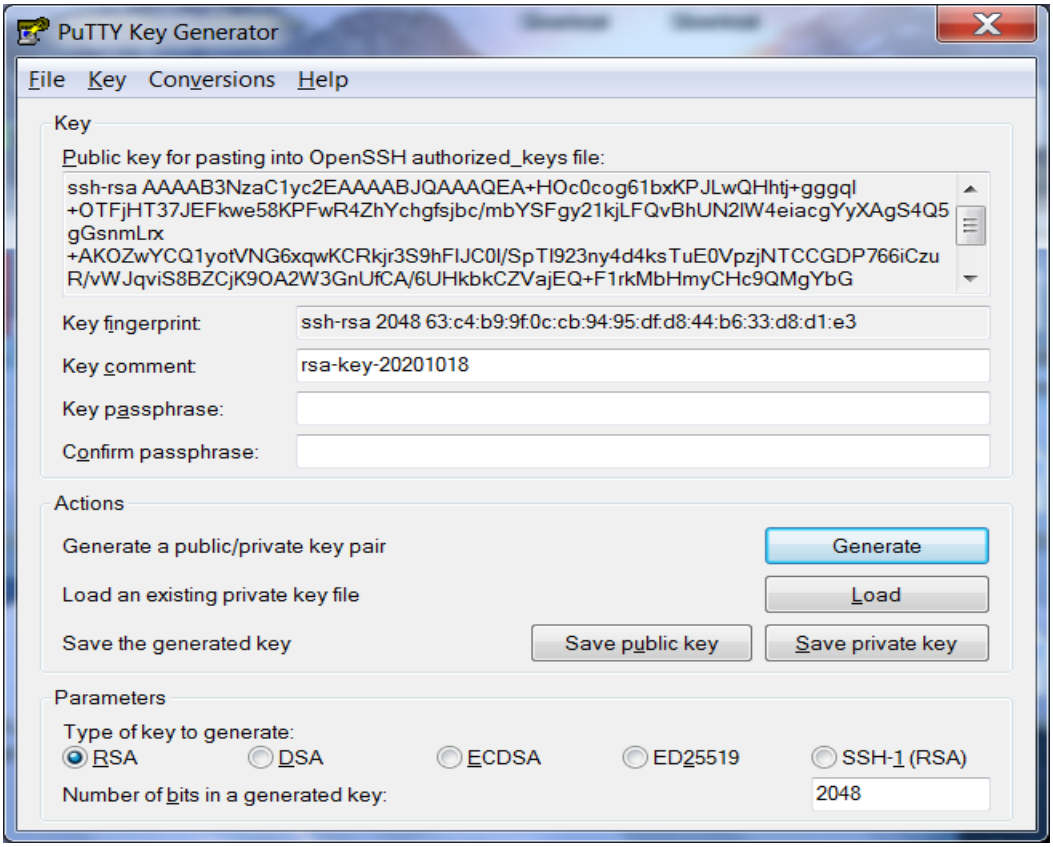


Once the PuTTYgen tool opens, ensure the following (see screenshot on **bottom left**):

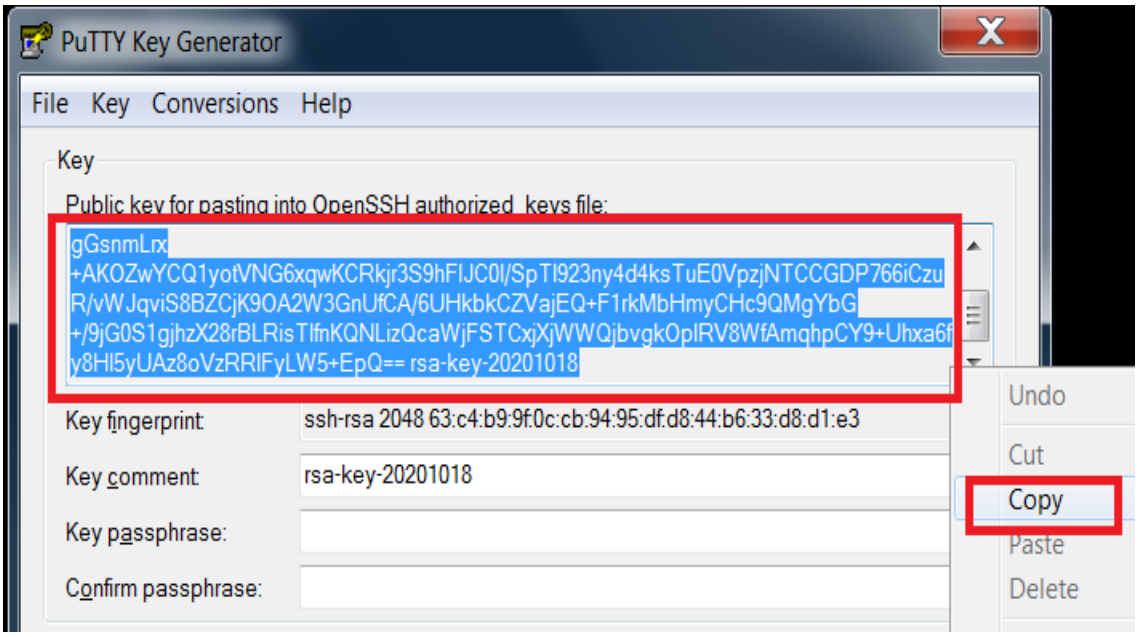
- Type of key to generate is set to: **RSA**
- Number of bits in a generated key is set to: **2048**

Click **Generate** to generate the key pair	After clicking **Generate**, move the mouse around the blank area randomly. This adds randomness to the key pair to make it harder to crack.
	

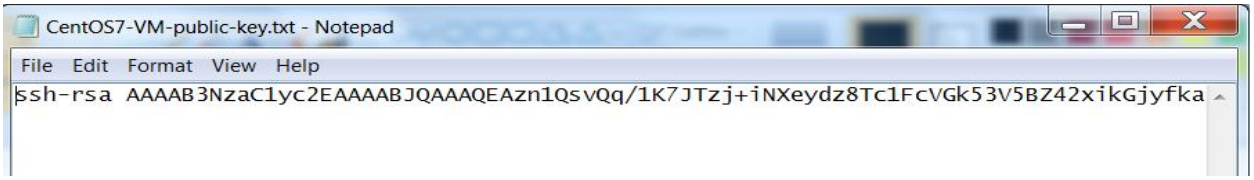
The SSH key pair was successfully created.



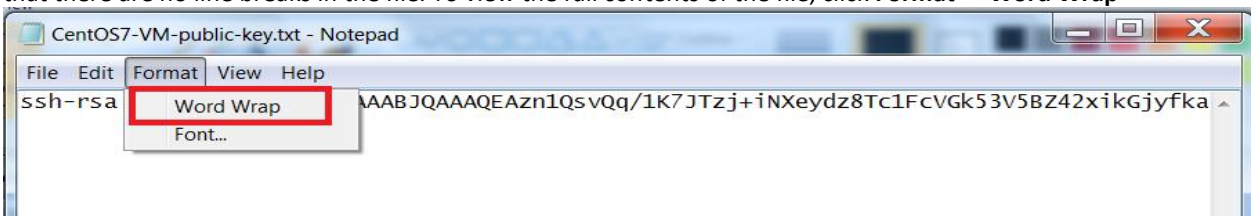
After the key pair is generated, we will need to copy the **Public key for pasting into the OpenSSH authorized_keys file**. Select all of the text in the area marked below and copy it to your clipboard.

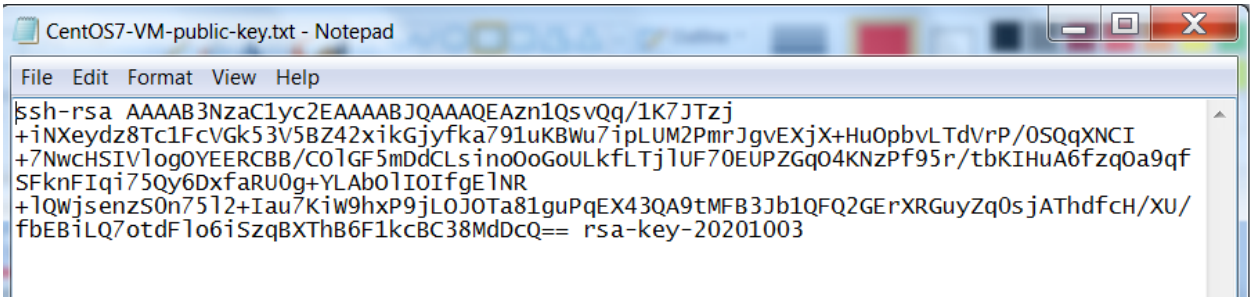


Next, open **Notepad** and paste the contents of your clipboard into an empty file.

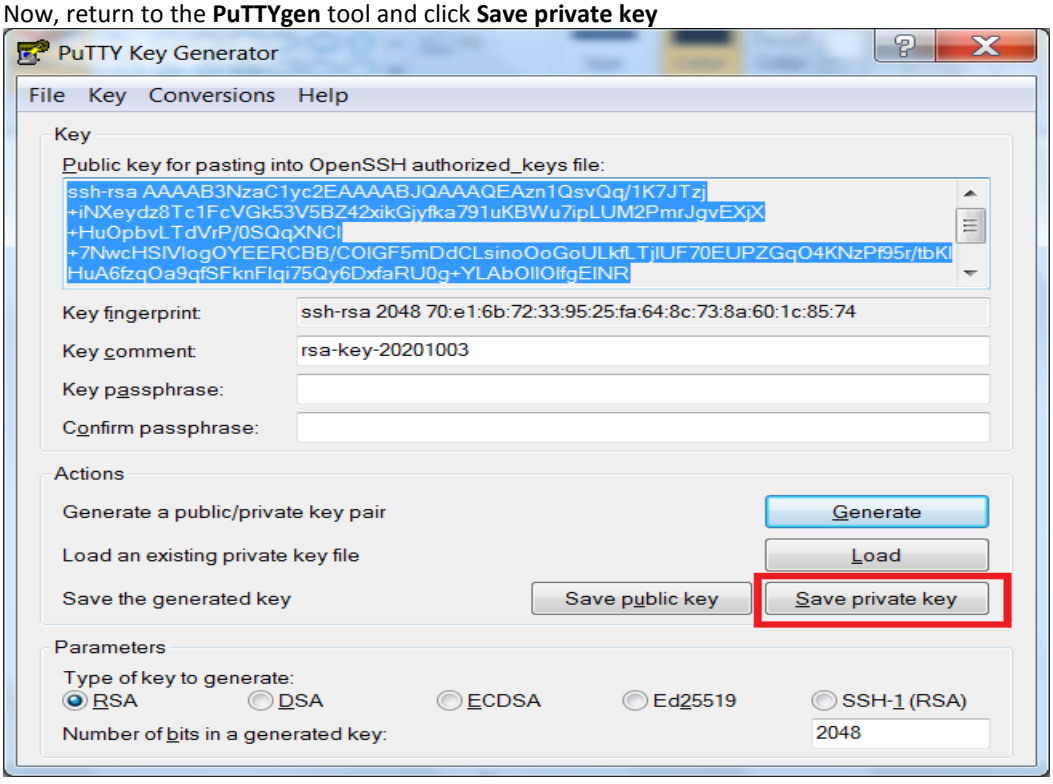


Save the file for future use (I saved it to my **Downloads** directory as **CentOS7-VM-public-key.txt**). You will notice that there are no line breaks in the file. To view the full contents of the file, click **Format -> Word Wrap**

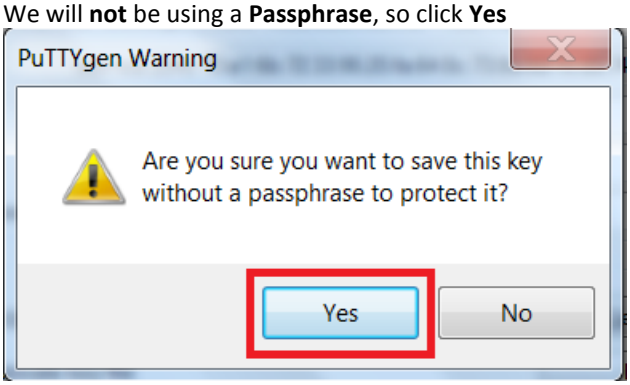




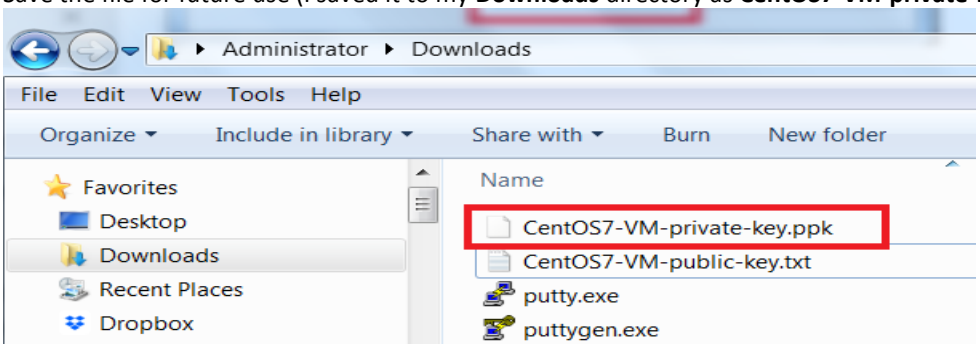
Now, return to the **PuTTYgen** tool and click **Save private key**



We will **not** be using a **Passphrase**, so click **Yes**



Save the file for future use (I saved it to my **Downloads** directory as **CentOS7-VM-private-key.ppk**).



Now that we have our SSH key pair, we can configure our VM to use the Public SSH key, of that key pair, to enable passwordless SSH connections.

Configure CentOS 7 VM

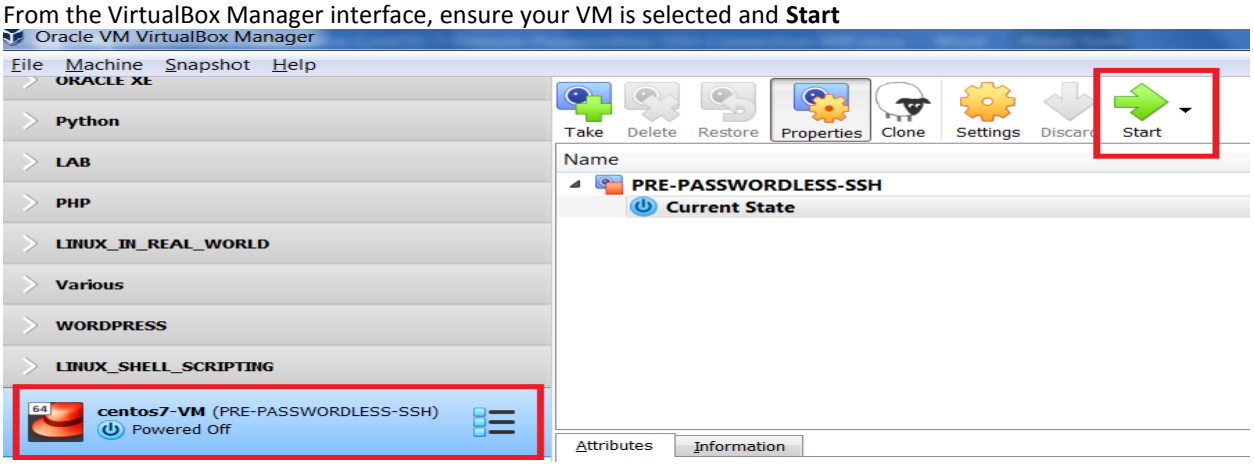
Using VirtualBox's default network adapter type of **NAT** will assign the VM an IP address, subnet mask and default gateway, on a different network than our host machine, using VirtualBox's DHCP Service.

Port forwarding allows us to map one IP address & port from out **host** to an IP address & port on the **guest VM**.

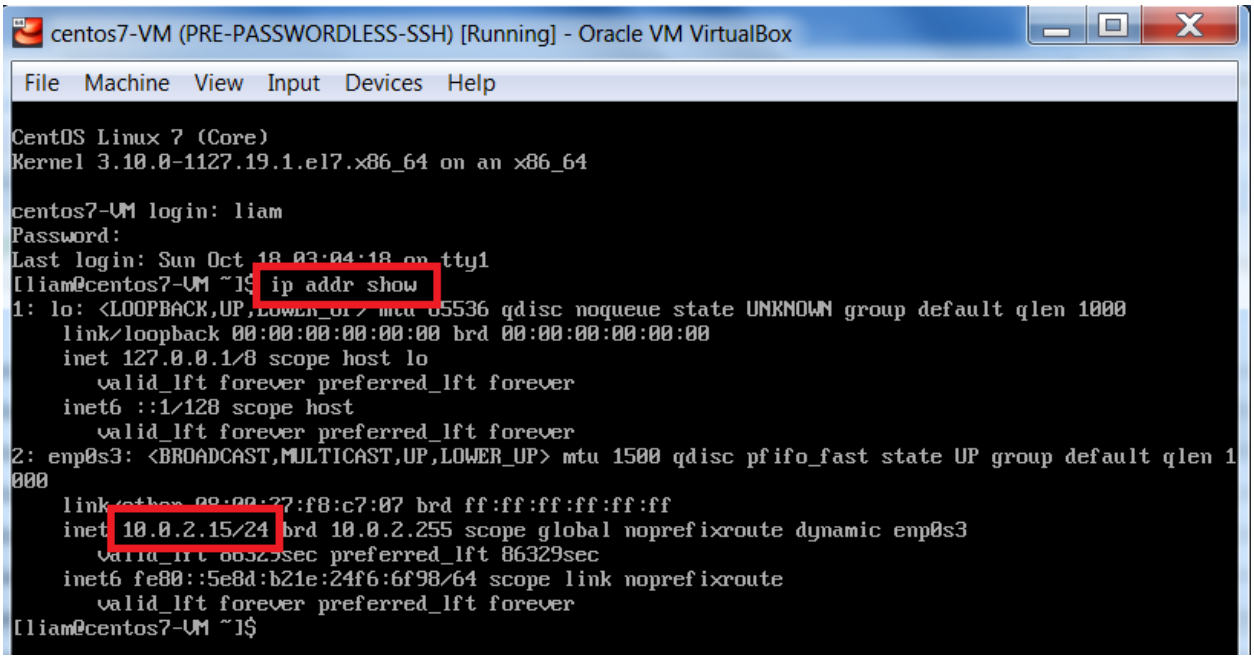
First, we will need to start our VM and determine which IP address has been assigned. After we identify the IP address, we can proceed with configuring port forwarding to allow an SSH connection from the host machine to the guest VM. Please note that the initial SSH connection, from host to guest, will require a password. Then, after making the necessary changes, our second, and subsequent, SSH connections will **not** require a password.

Start CentOS 7 VM

From the VirtualBox Manager interface, ensure your VM is selected and **Start**



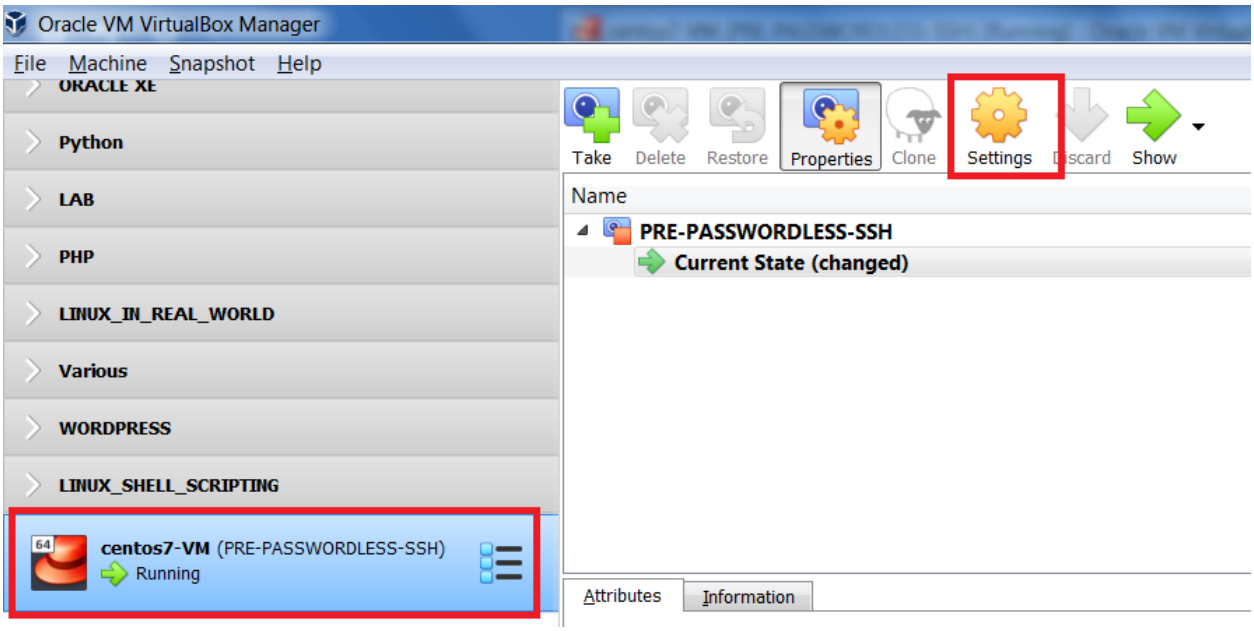
When the **CentOS 7 VM** has started, enter your user's credentials to login.
Then, to determine the IP address assigned to the VM, on the command line, execute the following:
`ip addr show`



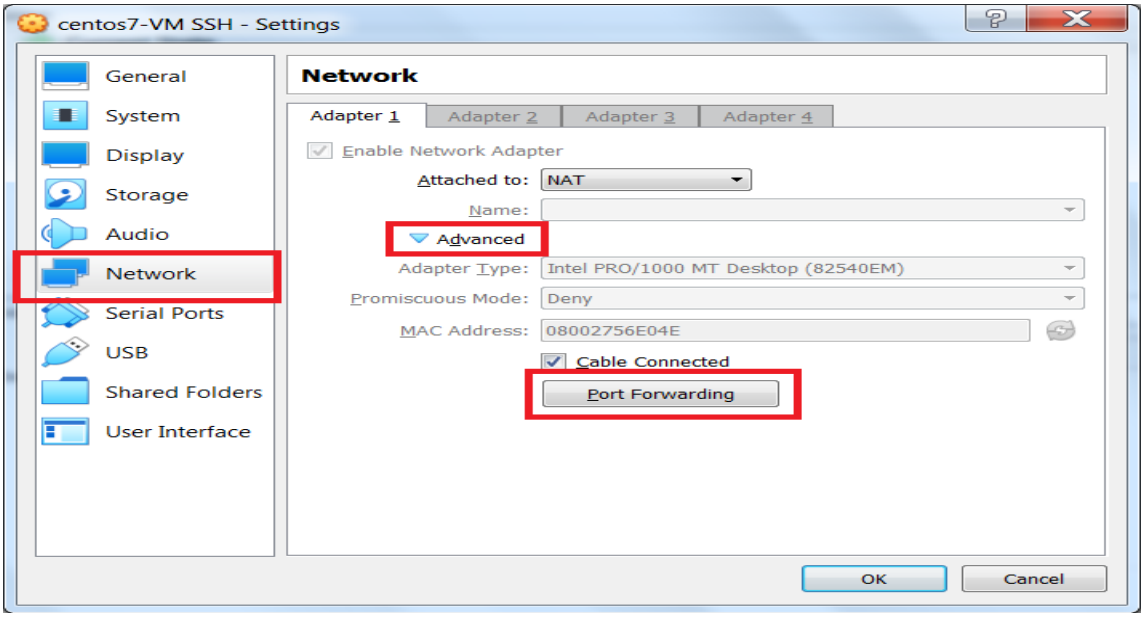
Now that we have the VM's IP address, we can configure port forwarding.

Configure Port Forwarding

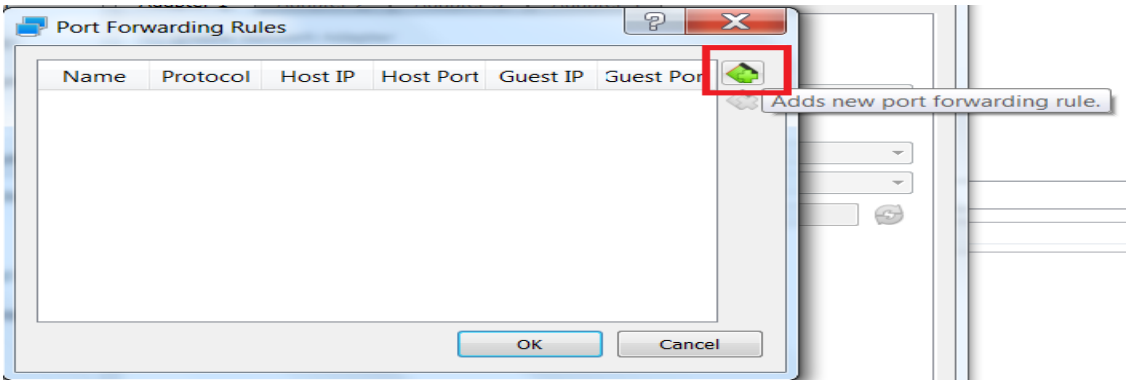
Return to the VirtualBox Manager interface, ensure your running VM is selected and click **Settings**

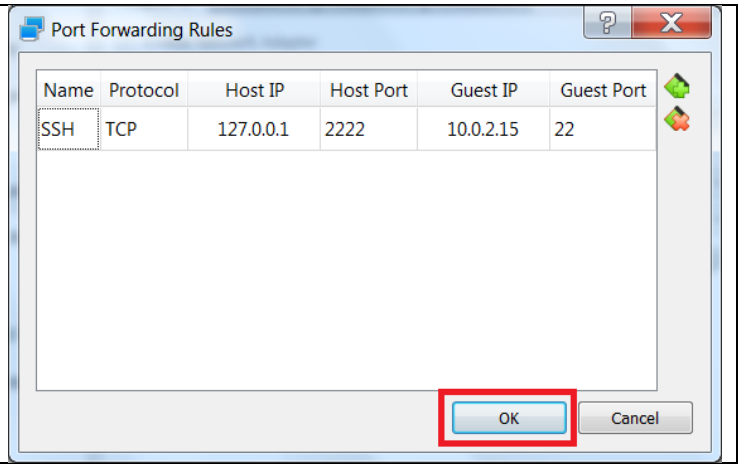


On the left, ensure **Network** is selected. Under **Network -> Adapter 1**, click the **Advanced** drop down to display all of the network adapter settings. Then, click the **Port Forwarding** button.

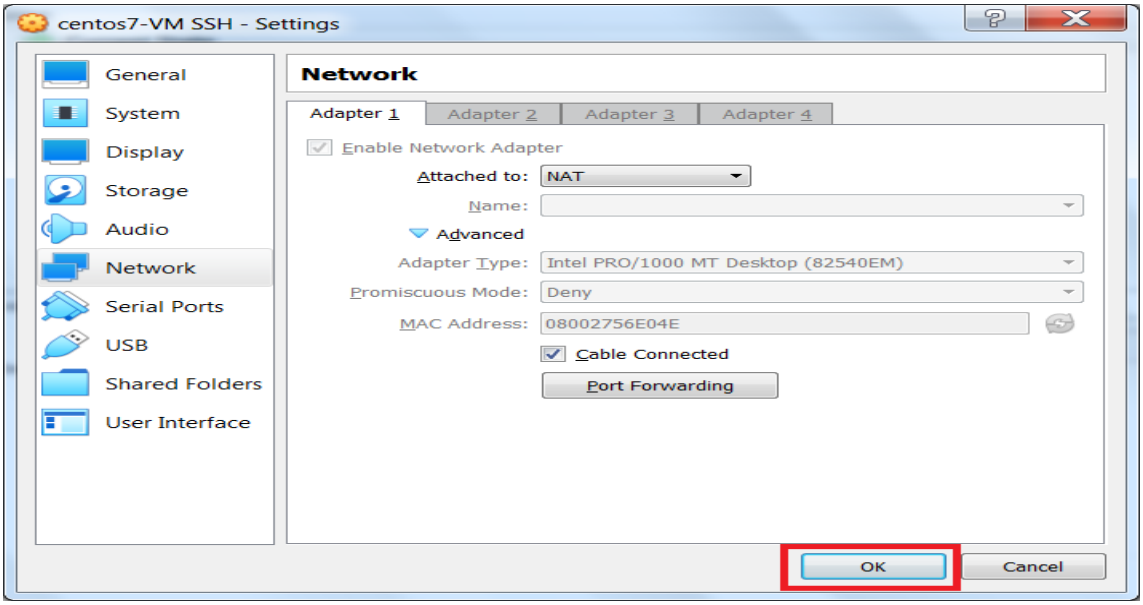


On the **Port Forwarding Rules** screen, to add a rule, click the green plus + button.



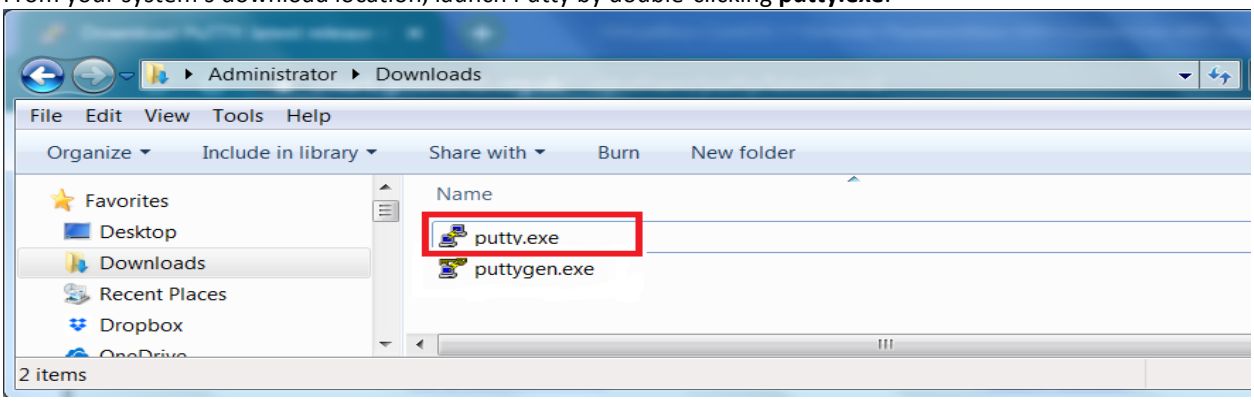
On the **Port Forwarding Rules** screen, enter the following: Name: **SSH** Protocol: **TCP** Host IP: **127.0.0.1 (host loopback IP)** Host Port: **2222** Guest IP: **10.0.2.15** Guest Port: **22** *Please note that your **Guest IP** could be different than mine.* To create the rule, click **OK**	

We have successfully created our **port forwarding** rule. To continue, click **OK**

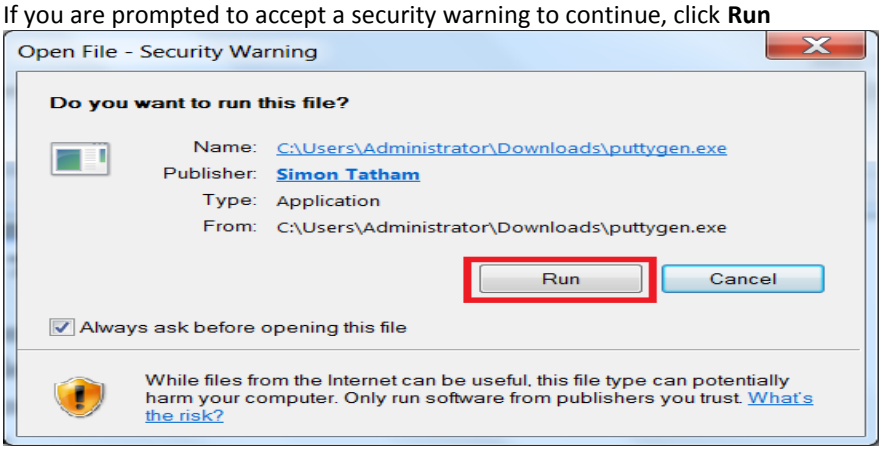


Connect to VM using Putty

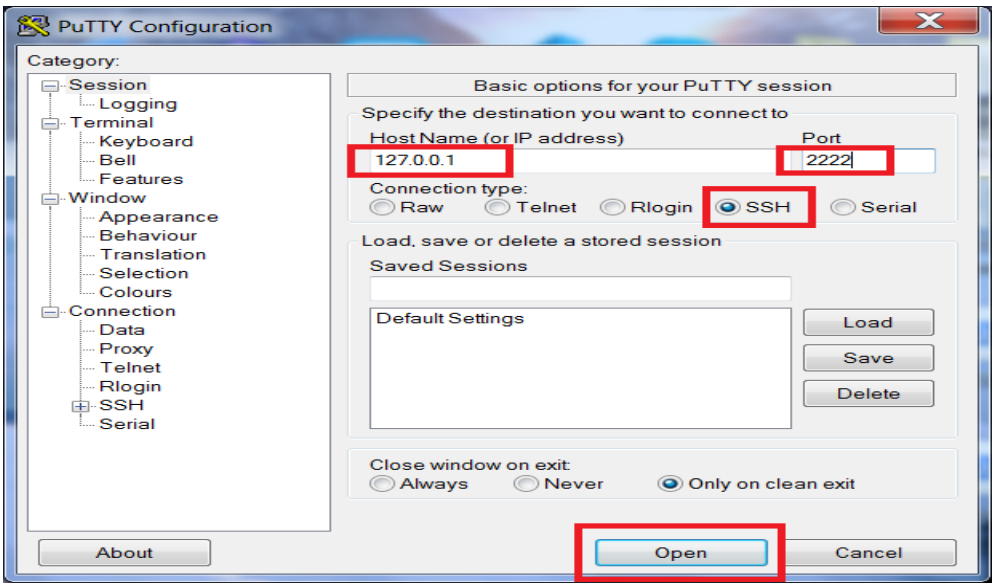
Now we will test our SSH connection to our CentOS 7 VM using Putty.
From your system's download location, launch Putty by double-clicking **putty.exe**.



If you are prompted to accept a security warning to continue, click **Run**

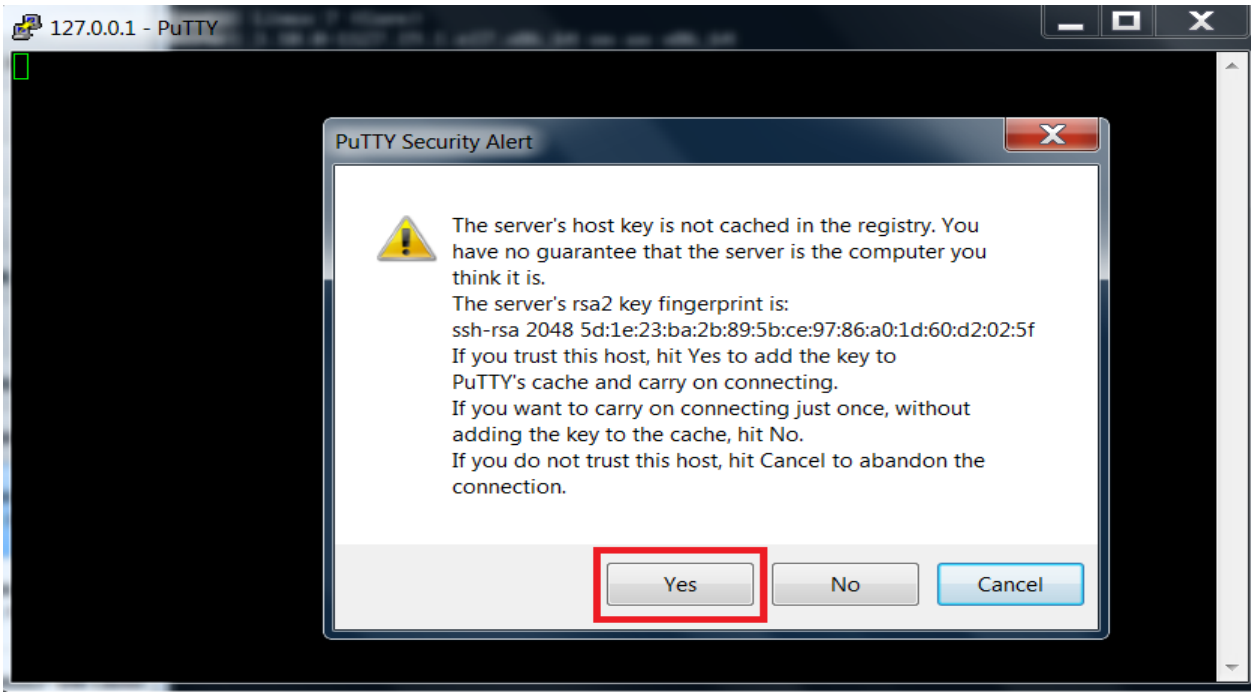


Once PuTTY opens, enter an IP address of **127.0.0.1**, Port **2222** and ensure the Connection type is **SSH**. Then, to open the session, click **Open**



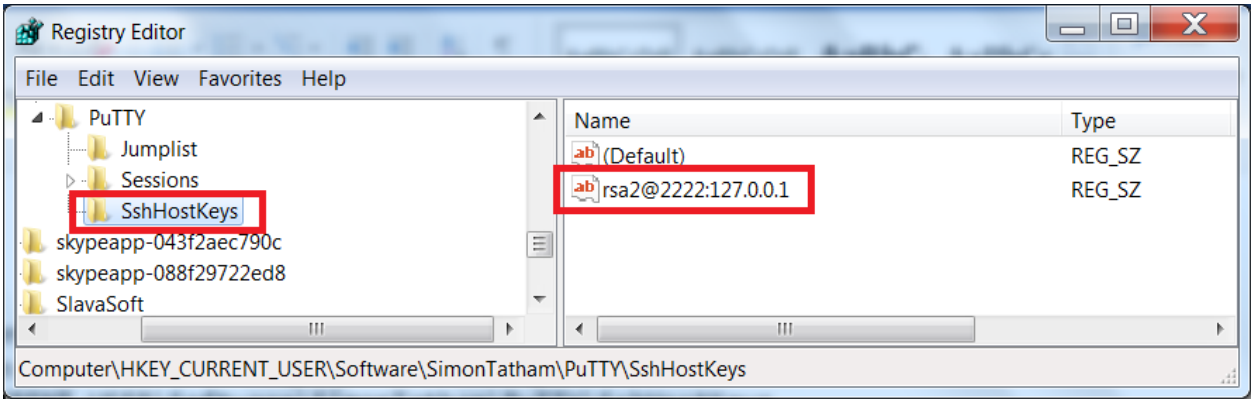
Because this is your first SSH connection to the guest VM, you will be prompted to trust the server's (VM's) host key. The server's **host key** refers to the server's **public SSH key**.

To continue, click **Yes**

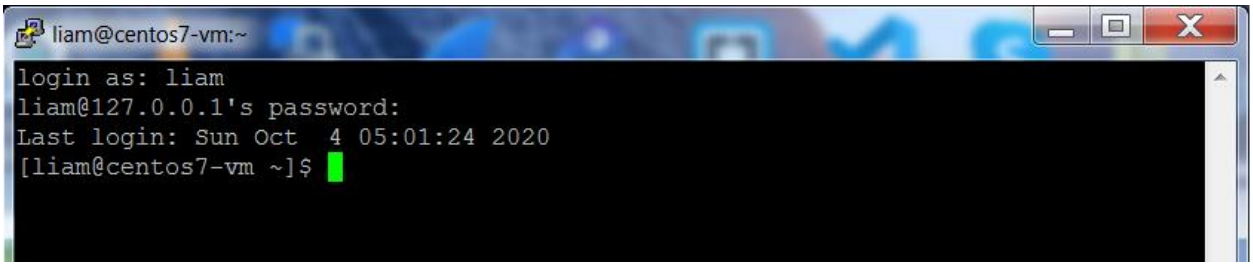


After trusting the server (clicking **Yes**), you will not be prompted with this message again because the server's host key will be stored in your host machine's registry at the following location:

`HKEY_CURRENT_USER\Software\SimonTatham\PuTTY\SshHostKeys`



After the session opens, enter your non-root user's credentials to login. In my case, when I installed CentOS 7 in my virtual machine, I created a non-root user, that has '**sudo**' privileges (administrator), with a username of **liam**.

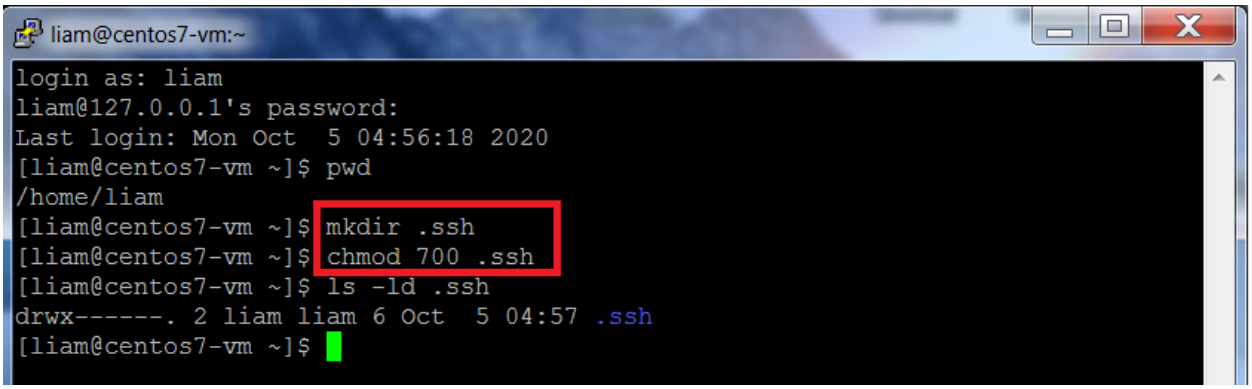


Install Public SSH Key on VM

Now that we are logged in, we can install our **Public SSH key** on our **CentOS 7 VM**. To do this, we will need to create the required directory, as well as, create, and populate, the **authorized_keys** file with our **Public SSH key**. This is needed for passwordless authentication using SSH.

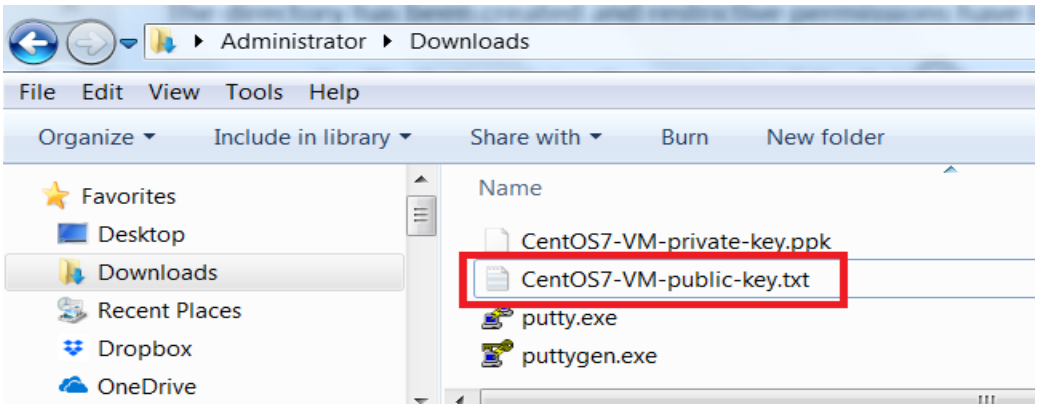
From the command line, to create the directory and set its permissions, execute the following:

```
mkdir .ssh
chmod 700 .ssh
```

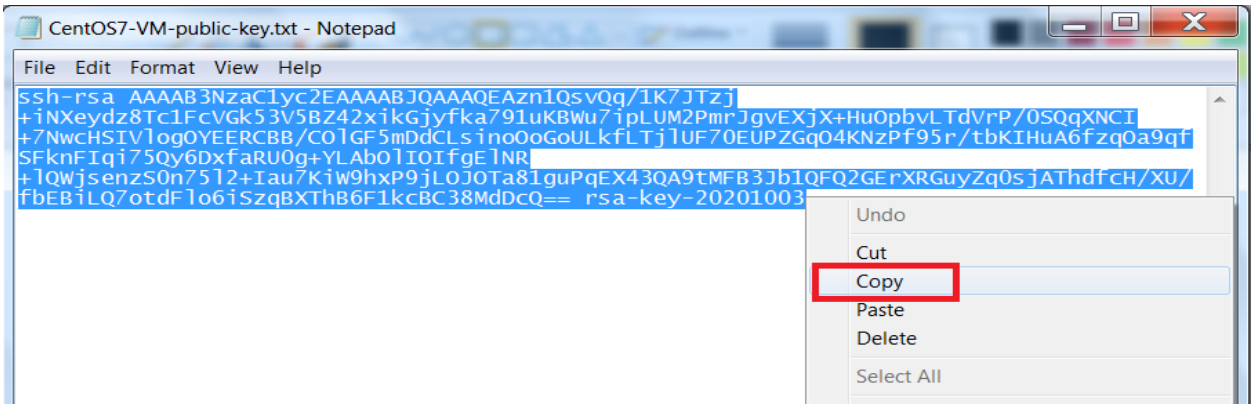


The directory has been created and restrictive permissions have been set (**only owner** has full access).

Now open the file that contains the contents of the **Public SSH key** we created earlier.
(in my case, I saved it to my **Downloads** directory as **CentOS7-VM-public-key.txt)**



Ensure all of the file's contents is selected, then, right-click and click **Copy**. This will copy the file contents to your clipboard.



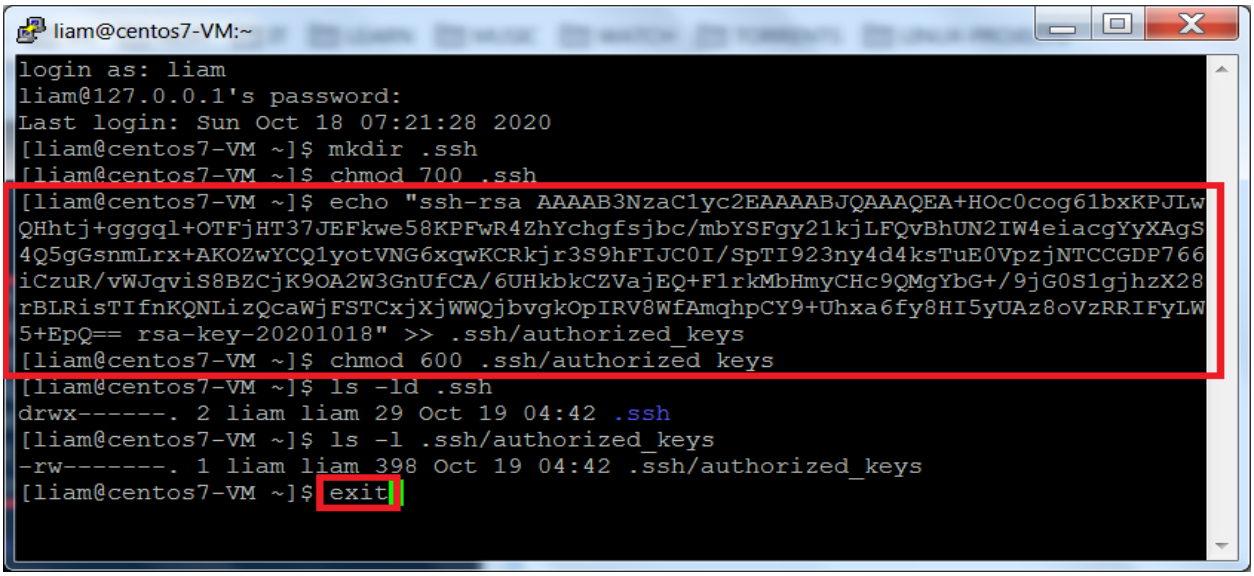
Return to your PuTTY session, and execute the following, (**using the contents you just copied to your clipboard**):
Please note, **do not use** my Public SSH key that is below (just wanted to provide you with an example) but, **enter your Public SSH key** between quotes:

```
echo "<your_Public_SSH_key>" >> .ssh/authorized_keys
```

```
echo "ssh-rsa
AAAAB3NzaC1yc2EAAAABJQAAAQEA+HOc0cog61bxKPJLwQHhtj+gggql+OTFjHT37JEFkwe58KPFwR4ZhYchg
fsjbc/mbYSFgy21kjLFQvBhUN2IW4eiacgYyXAgS4Q5gGsnmLrx+AKOZwYCQ1yotVNG6xqwKCRkjr3S9hFIJC
0I/SpTI923ny4d4ksTuE0VpzjNTCCGDP766iCzuR/vWJqviS8BZCjK9OA2W3GnUfCA/6UHkbkCZVajEQ+F1rk
MbHmyCHc9QMgYbG+/9jG0S1gjhzX28rBLRisTIfnKQNLizQcaWjFSTCxjXjWWQjbvgkOpIRV8WfAmqhpCY9+U
hxa6fy8HI5yUAz8oVzRRIFyLW5+EpQ== rsa-key-20201018" >> .ssh/authorized_keys
```

After creating the **authorized_keys** file, set restrictive permissions on the file by executing the following:
`chmod 600 .ssh/authorized_keys`

Finally, close your Putty session, by executing:
`exit`

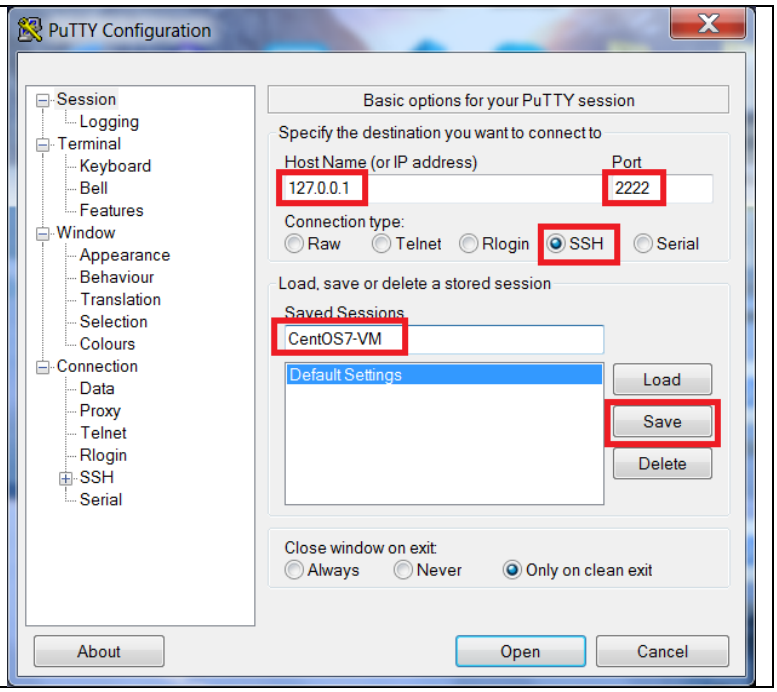


Configure Putty Session

Now we need to configure a Putty session for passwordless authentication using SSH.

[Step 1: create a Putty session](#)
[Step 2: set default username for the Putty session](#)
[Step 3: attach the SSH private key to session](#)
[Step 4: save the session](#)

Step 1: create a Putty session

First, locate where you downloaded **PuTTY** and launch it by double-clicking **putty.exe**. To create a session, enter the following: Host Name (IP): **127.0.0.1** Port: **2222** Type: **SSH** Under **Saved Sessions**, enter a name you will remember. I entered **CentOS7-VM**. Then, click **Save**	

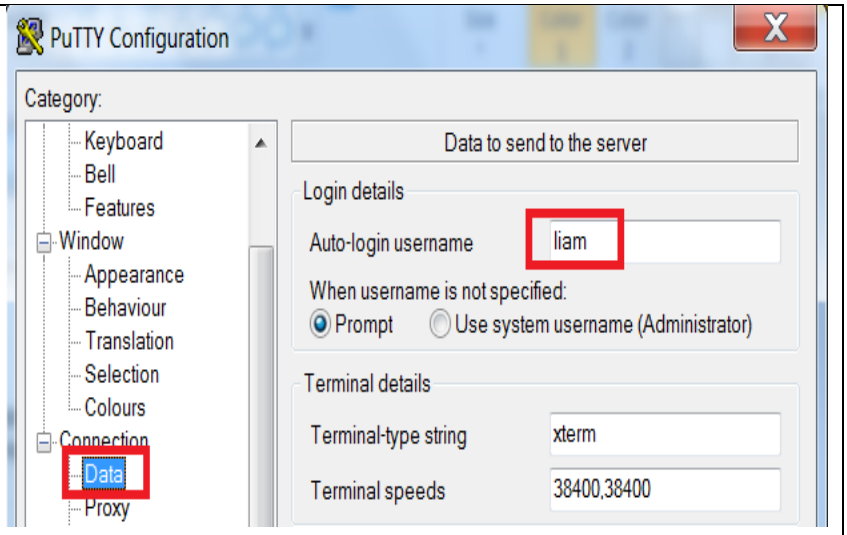
Step 2: set default username for the Putty session

Now, on the left-hand side, under **Category: Connection**, click the option **Data**.

Under **Login Details**, set the **Auto-login username** to the **same** user used to complete the previous section (Install Public SSH Key on VM). In my case, the user **liam**:

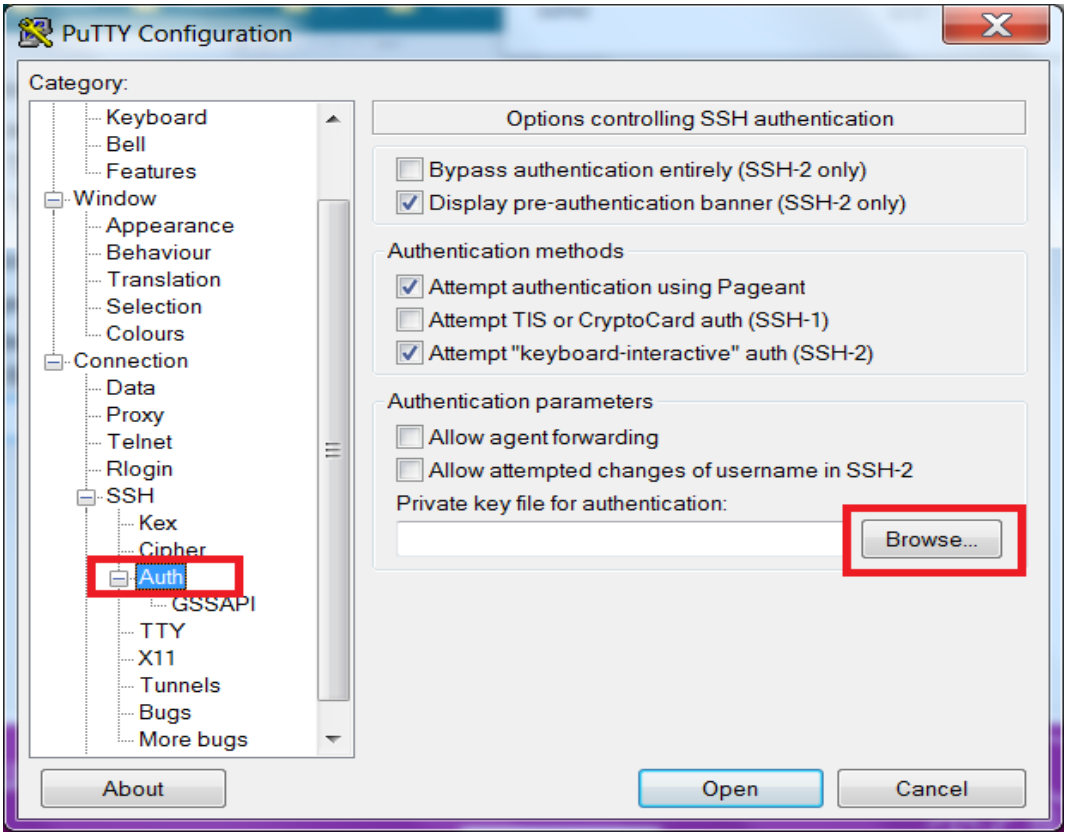
- created the **.ssh** directory
- populated **authorized_keys**
- set permissions on both

User **liam** is the **owner** of both the directory and the file.

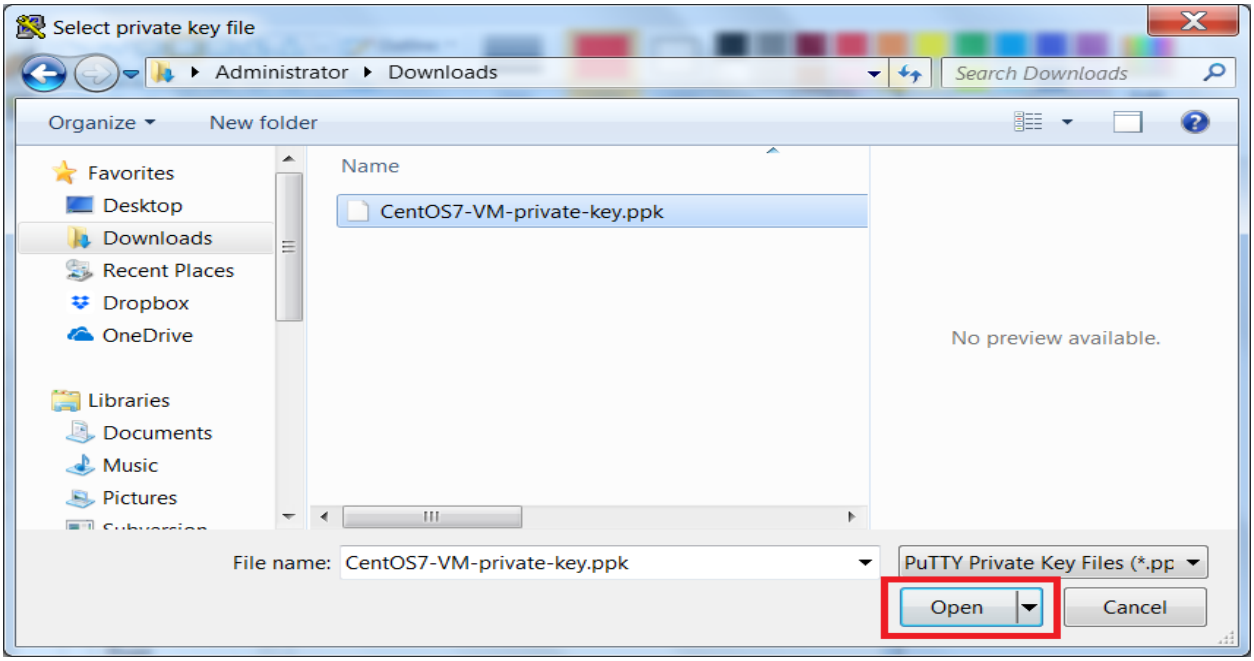


Step 3: Attach the SSH private key to session

Navigate to **Connection -> SSH -> Auth** and click the **Browse** button to locate the private key saved earlier.

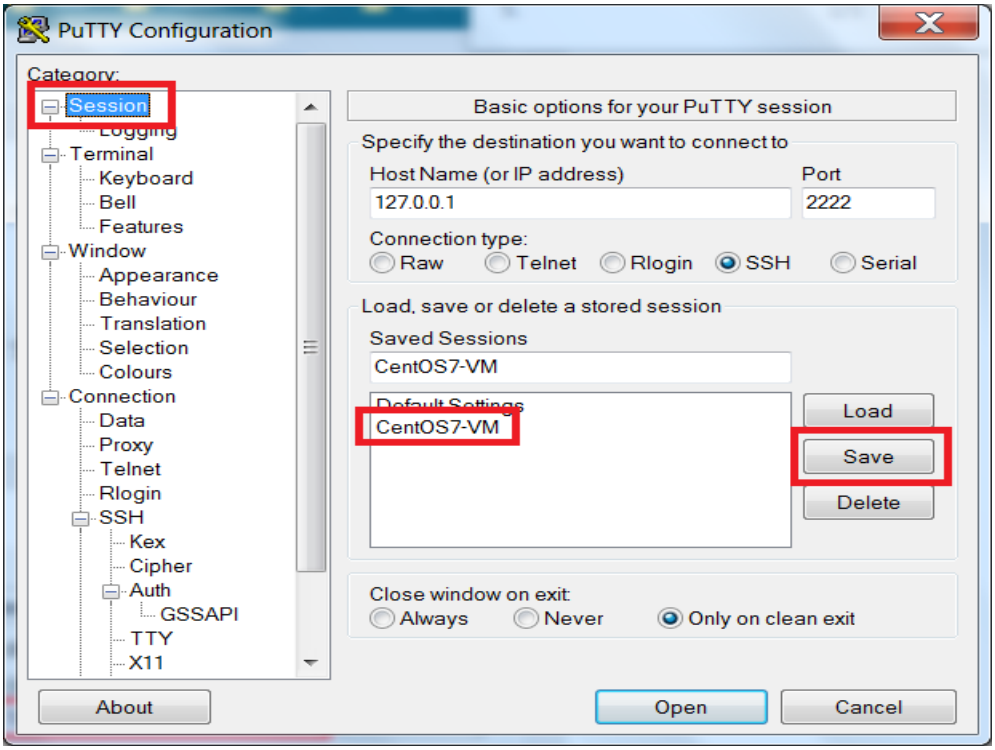


Locate your private key and click **Open**



Step 4: save the session

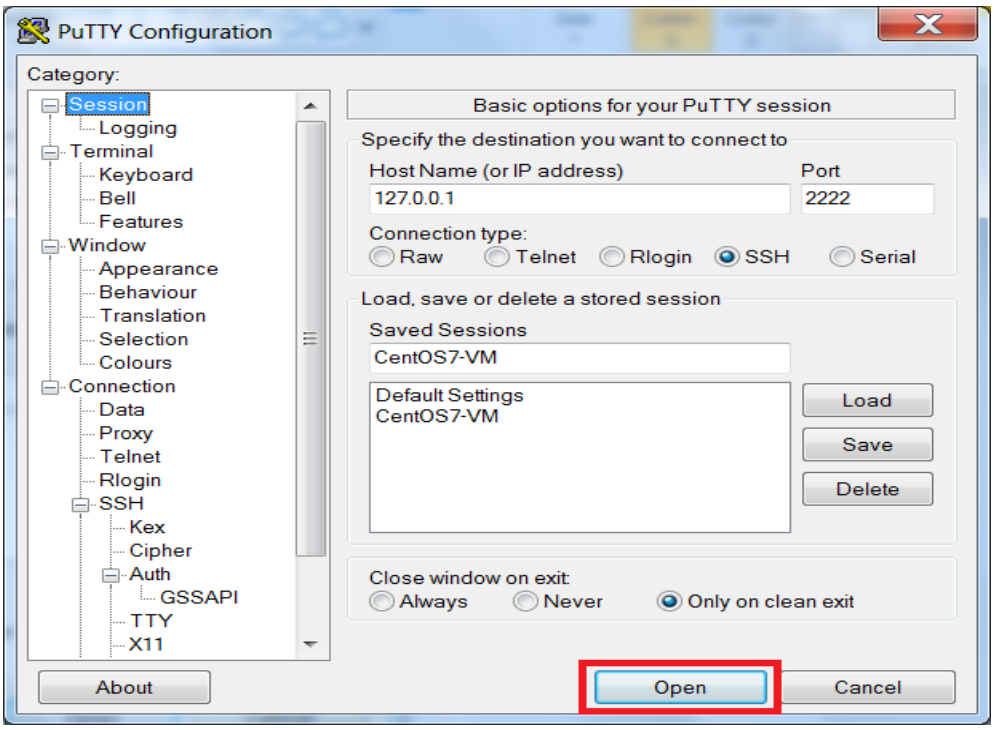
After making the necessary session changes to allow for passwordless authentication, on the left, under **Category:**, click **Session**, then, click **Save**



We are now ready to open a PuTTY session using our SSH key pair to authenticate (**no password required**).

Putty Passwordless SSH Connection to VM

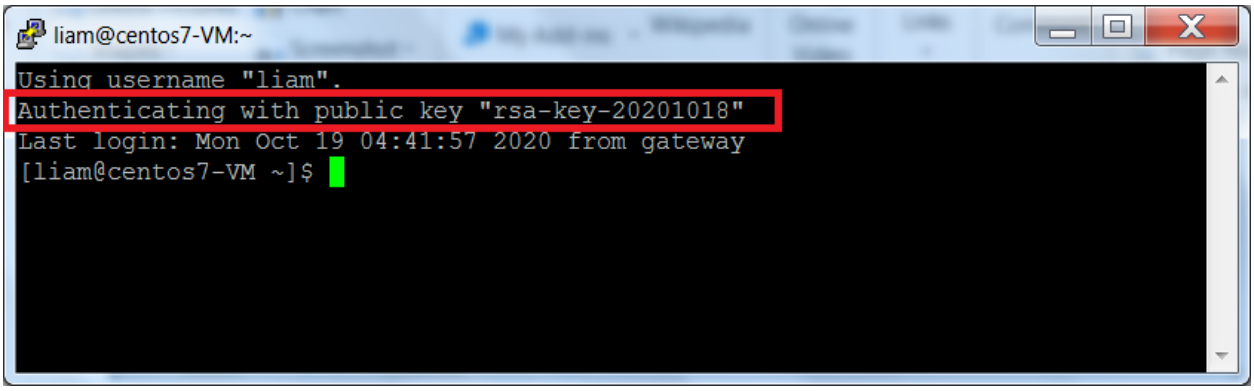
From **PuTTY**'s main window, ensure your newly created session is loaded and click **Open**.



You should see "**Authenticating with public key "your_Public_key_comment"**".

Refer back to the **Generate SSH Key Pair using Putty** section for SSH key pair information (i.e. **PuTTY Key Generator – Key Comment** field).

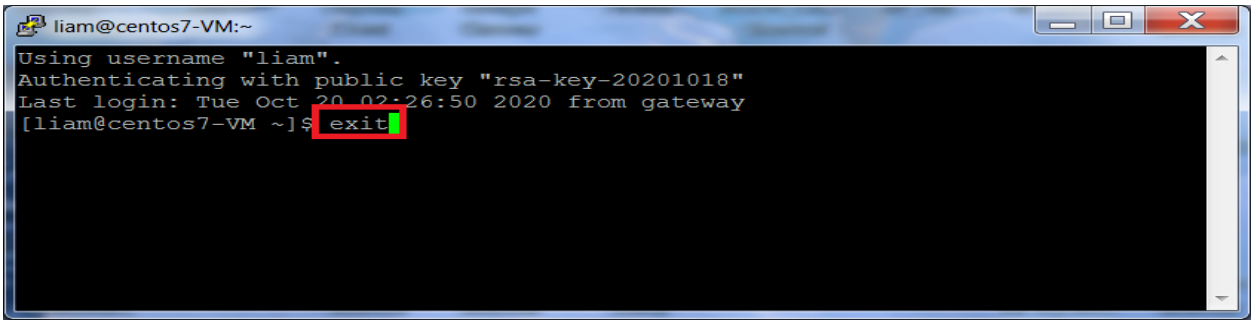
Also, please note that your SSH key pair information will be different than my SSH key pair information.



We have used the **PuTTY** SSH client to successfully connect to our CentOS 7 VM without providing a password.

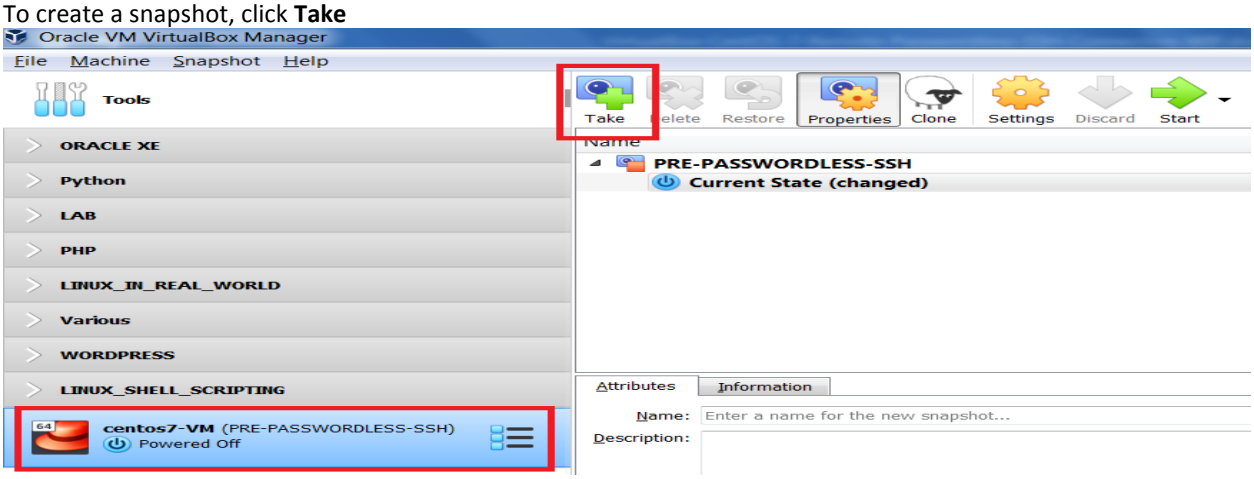
To finish the tutorial, we will take a snapshot to save our changes for future use.

To close the **PuTTY** session, execute the following command:
`exit`



Take Post SSH Connection Snapshot

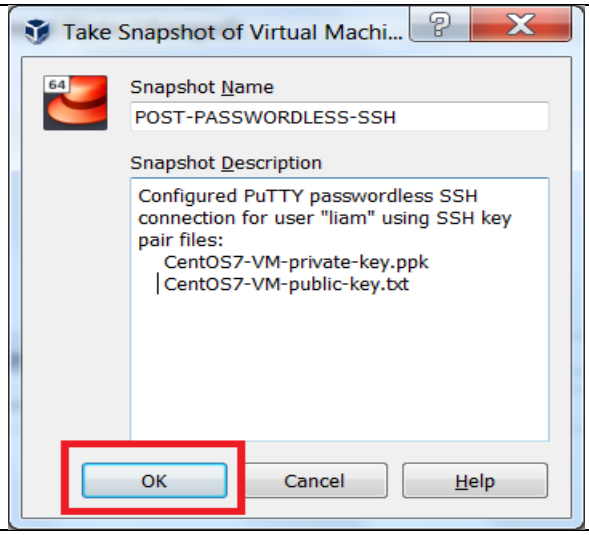
From the VirtualBox Manager interface, ensure your VM is selected and that you are in "**Snapshots**" view.
To create a snapshot, click **Take**

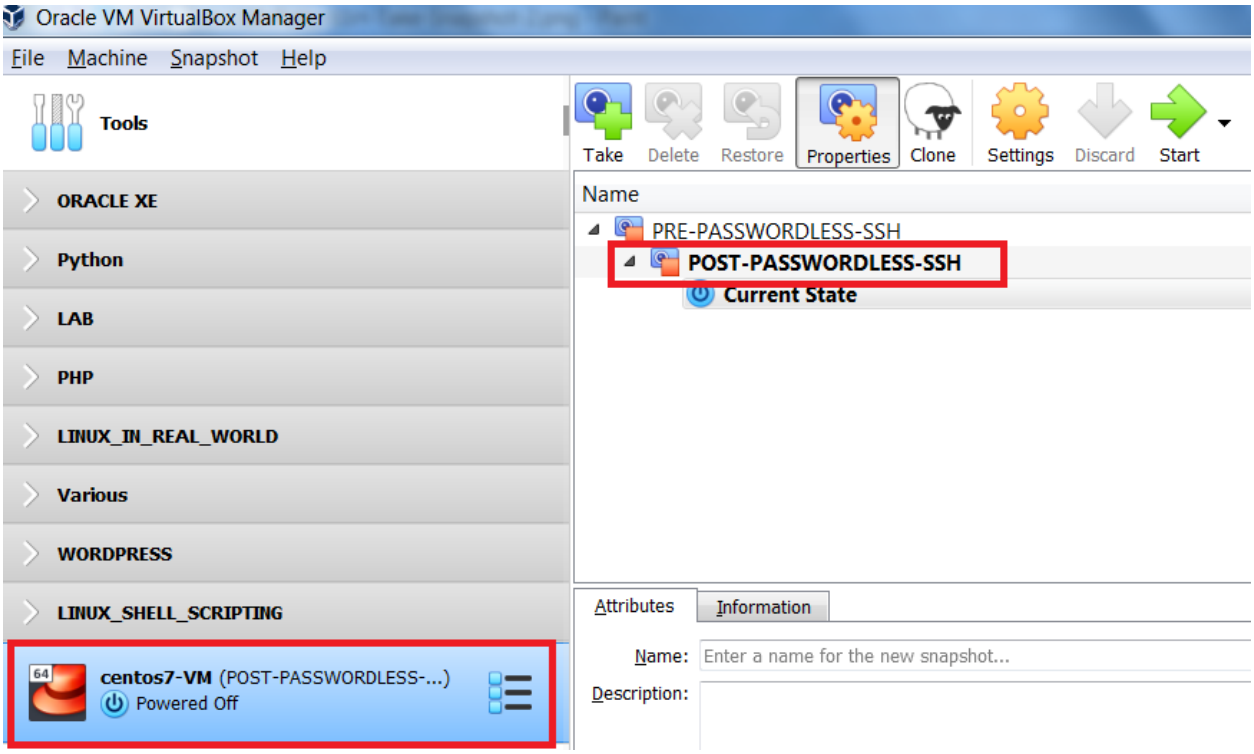


Enter a name for the snapshot, as well as, a short description, then, click **OK**

I've taken a snapshot "**POST-PASSWORDLESS-SSH**" to ensure that I have a virtual machine that is configured to be accessible by user **liam** via a PuTTY passwordless SSH connection.

This will come in handy whenever I need to connect to this virtual machine.





Hopefully, you've enjoyed completing this tutorial and found it helpful.

If you would like see more of my tutorial offerings, they can be accessed **here**.

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