

Remote SSH to VM

Partly Self-Study

Remote SSH to VM via SSH Shell (1/2)

```
C:\Windows\system32\cmd.exe

C:\Users\gokhale>ssh
usage: ssh [-46AaCfGgKkMNnqsTtVvXxYy] [-b bind_address] [-c cipher_spec]
          [-D [bind_address:]port] [-E log_file] [-e escape_char]
          [-F configfile] [-I pkcs11] [-i identity_file]
          [-J [user@]host[:port]] [-L address] [-l login_name] [-m mac_spec]
          [-O ctl_cmd] [-o option] [-p port] [-Q query_option] [-R address]
          [-S ctl_path] [-W host:port] [-w local_tun[:remote_tun]]
          destination [command]

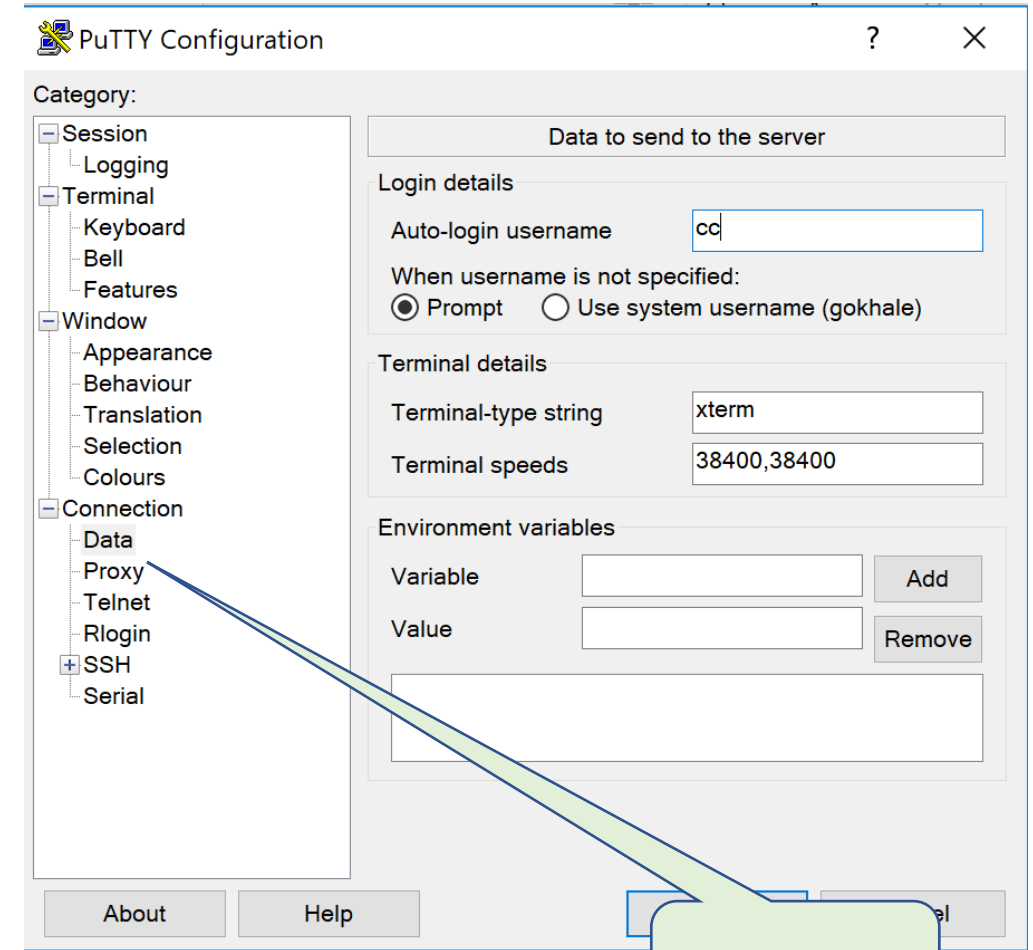
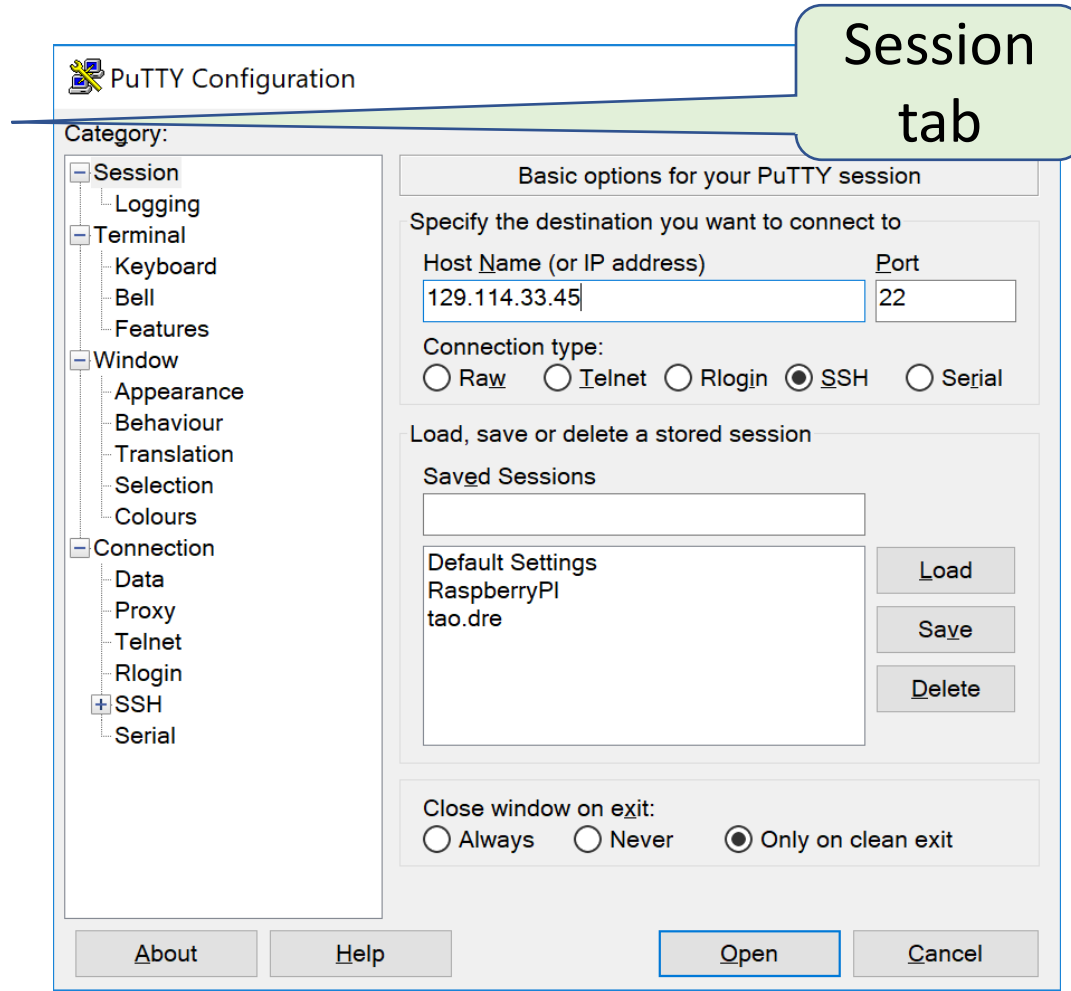
C:\Users\gokhale>ssh -l cc -i C:\Users\gokhale\.ssh\gokhale_chameleon.pem 129.114.33.45
```

Use forward slash for
Mac/Linux, and your path
may be different

Remote SSH to VM via SSH Shell (2/2)

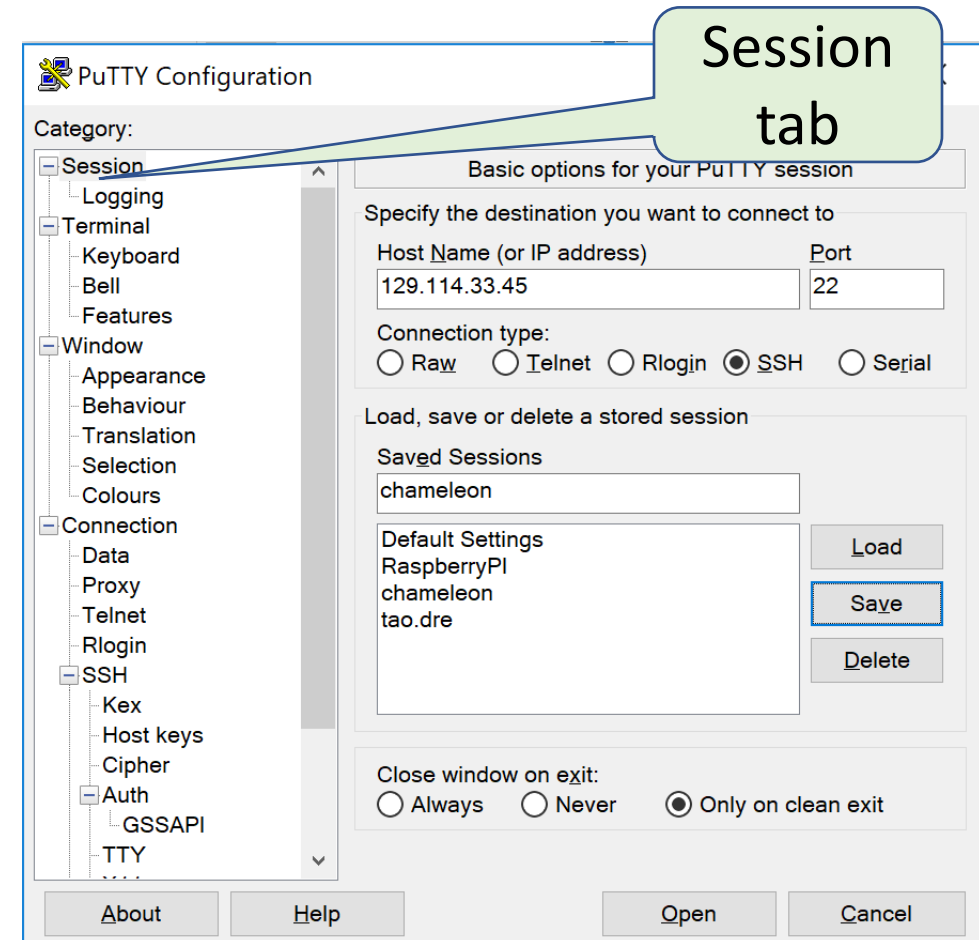
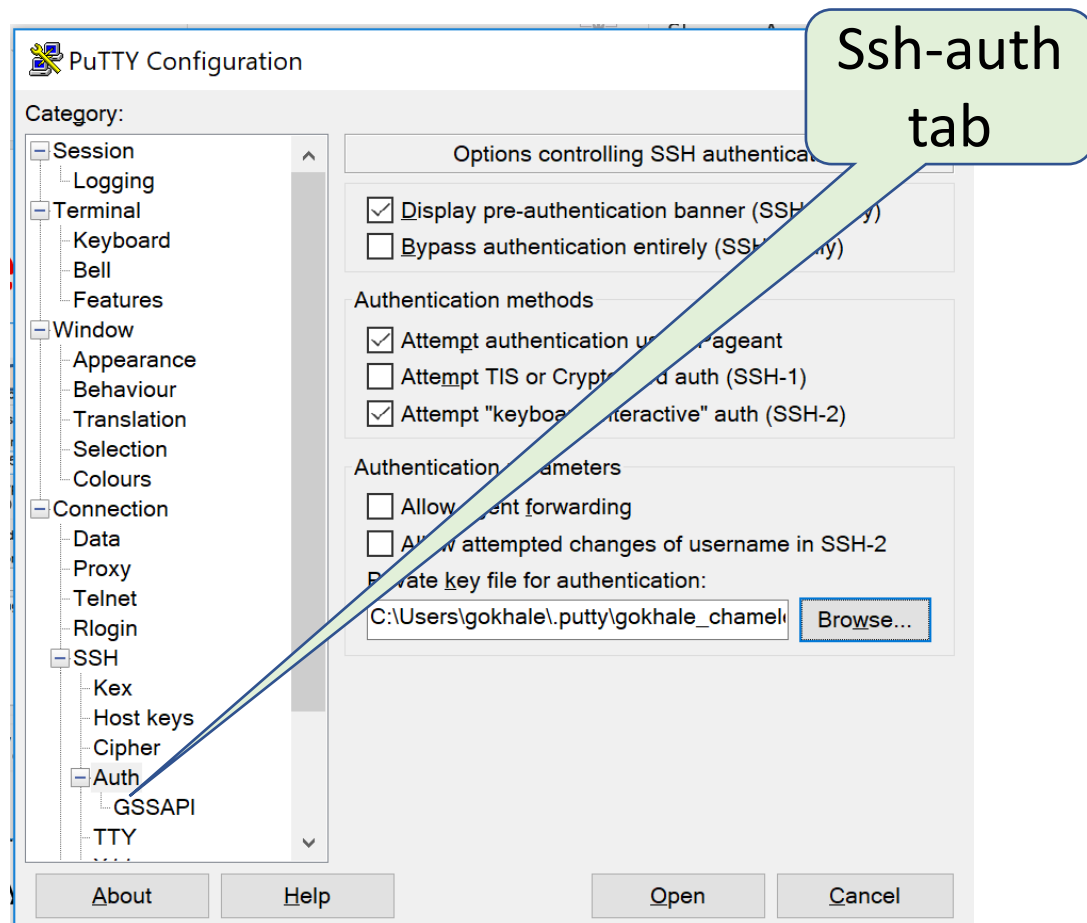
```
cc@gokhale-fall18-vm: ~  
destination [command]  
C:\Users\gokhale>ssh -l cc -i C:\Users\gokhale\.ssh\gokhale_chameleon.pem 129.114.33.45  
Welcome to Ubuntu 16.04.4 LTS (GNU/Linux 4.4.0-121-generic x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:        https://ubuntu.com/advantage  
  
Get cloud support with Ubuntu Advantage Cloud Guest:  
  http://www.ubuntu.com/business/services/cloud  
  
0 packages can be updated.  
0 updates are security updates.  
  
New release '18.04.1 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
Last login: Sun Sep  9 19:34:45 2018 from 209.30.118.72  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
cc@gokhale-fall18-vm:~$
```

Remote SSH to VM via PuTTY (1/7)



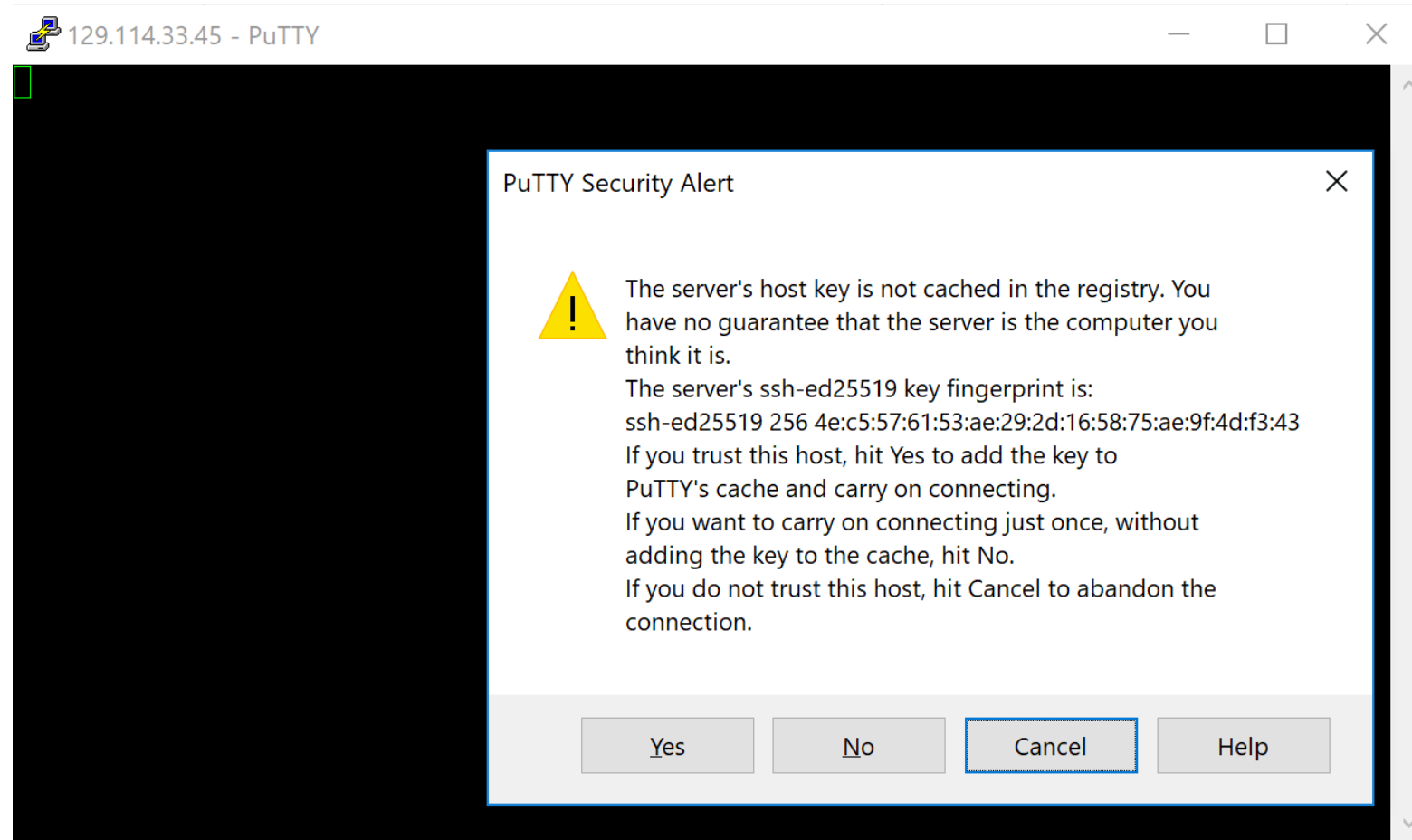
- Now start the PuTTY executable.
- Under Session tab, type the floating IP address in the host name region.
- Under the Data tab, type **cc** as the user name.

Remote SSH to VM via PuTTY (2/7)



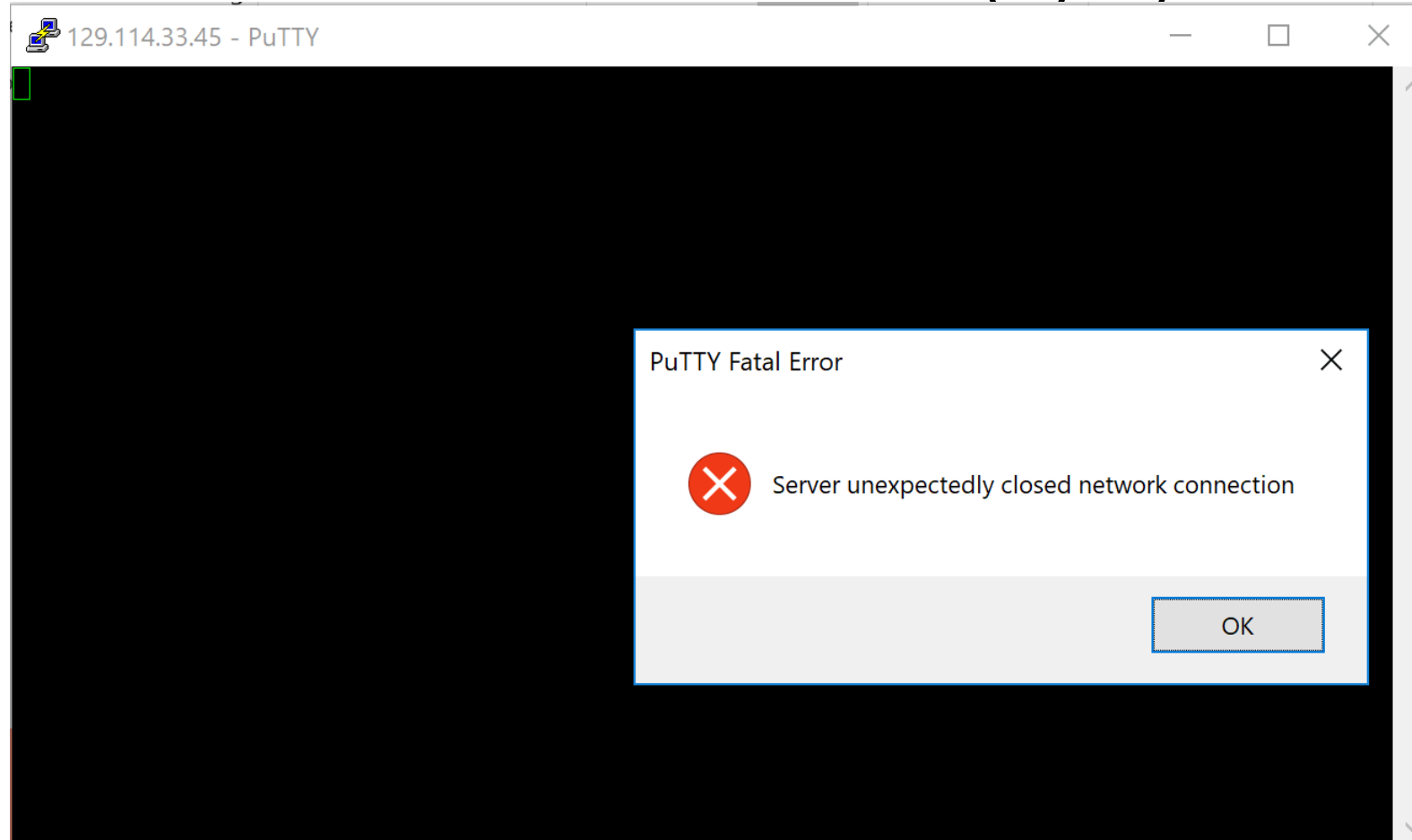
- Under the SSH-Auth tab, enter the location of your stored private key (the *.ppk file).
- Go back to Session tab and save this configuration under some name.
 - You may have to change the IP address if you get a new floating IP the next time.
- Click **Open**.

Remote SSH to VM via PuTTY (3/7)



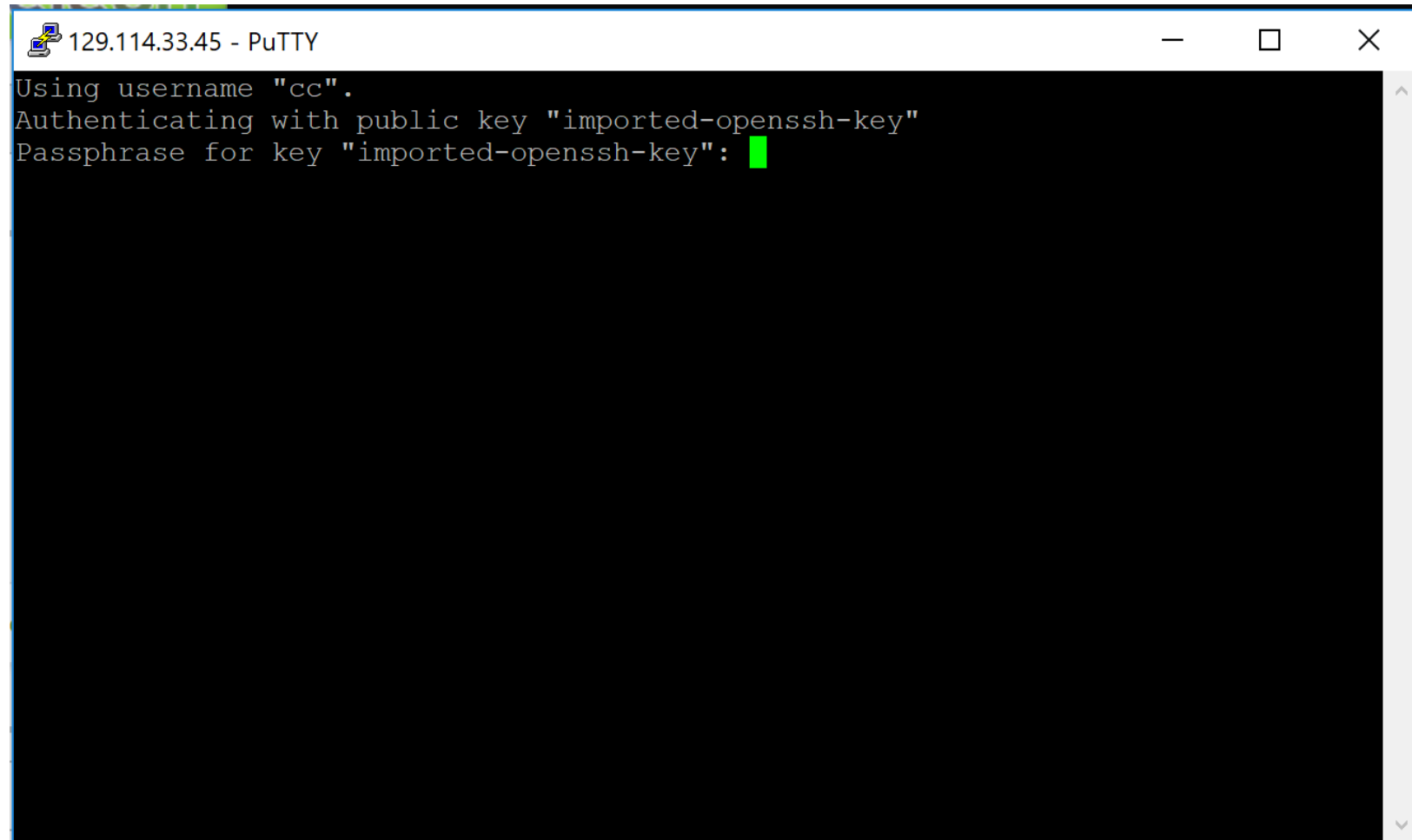
- Click **No**.
- If you click **Yes**, and the next time you get a different floating IP address, you will need to manually clean the SSH cache and/or overwrite the cache.

Remote SSH to VM via PuTTY (4/7)



- We see a message indicating failure to connect.
- But we were able to ping to the VM, so why are we not able to SSH into the VM?
- Let us see why.

Remote SSH to VM via PuTTY (5/7)



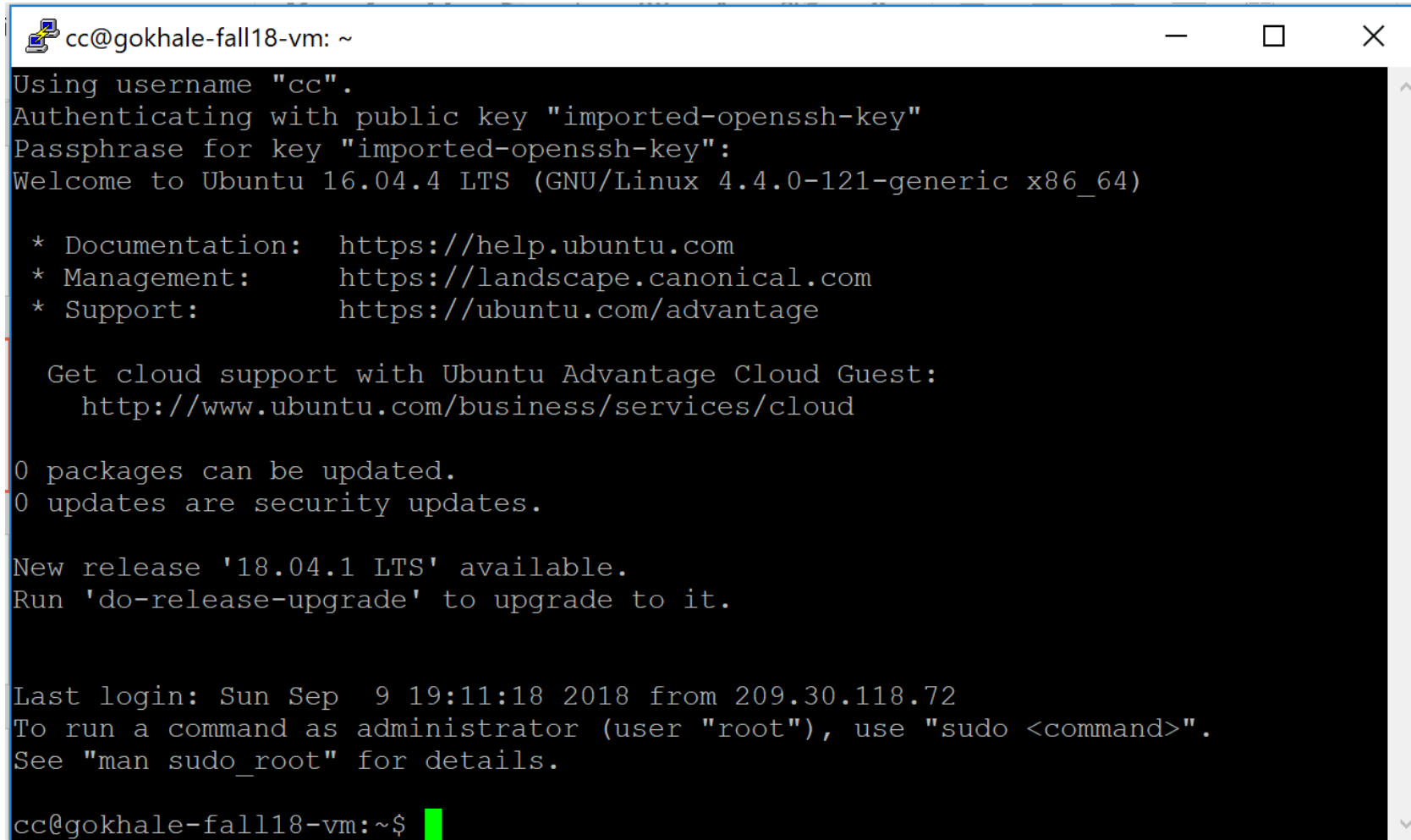
The screenshot shows a PuTTY terminal window titled "129.114.33.45 - PuTTY". The terminal output is as follows:

```
Using username "cc".  
Authenticating with public key "imported-openssh-key"  
Passphrase for key "imported-openssh-key": █
```

The terminal has a black background with white text. A green cursor is visible at the end of the passphrase prompt. The window has standard Windows-style title bar controls (minimize, maximize, close) in the top right corner.

- If your private key needs a paraphrase, enter it when asked as shown.

Remote SSH to VM via PuTTY (6/7)



```
cc@gokhale-fall18-vm: ~
Using username "cc".
Authenticating with public key "imported-openssh-key"
Passphrase for key "imported-openssh-key":
Welcome to Ubuntu 16.04.4 LTS (GNU/Linux 4.4.0-121-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud

0 packages can be updated.
0 updates are security updates.

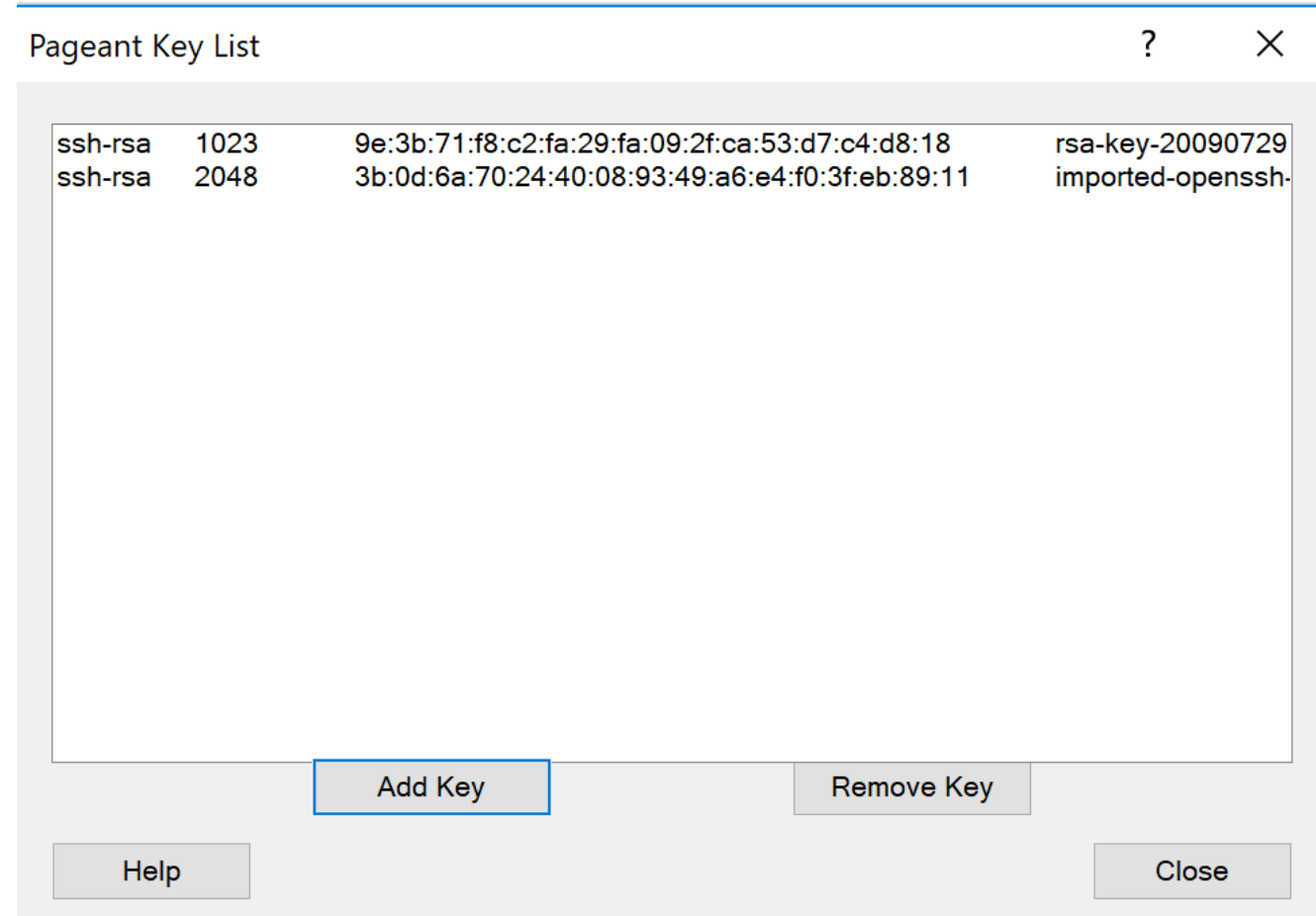
New release '18.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Sun Sep  9 19:11:18 2018 from 209.30.118.72
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

cc@gokhale-fall18-vm:~$
```

- Successful login into our Chameleon VM
- Similar behavior with SSH command in shell

Remote SSH to VM via PuTTY (7/7)



- You can avoid specifying passphrase every time by starting the pageant.exe executable and loading the private key in it.

Remote SSH to VM from Linux/Mac (1/8)

Ubuntu17_CloudClass [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Terminal Terminal File Edit View Search Terminal Help

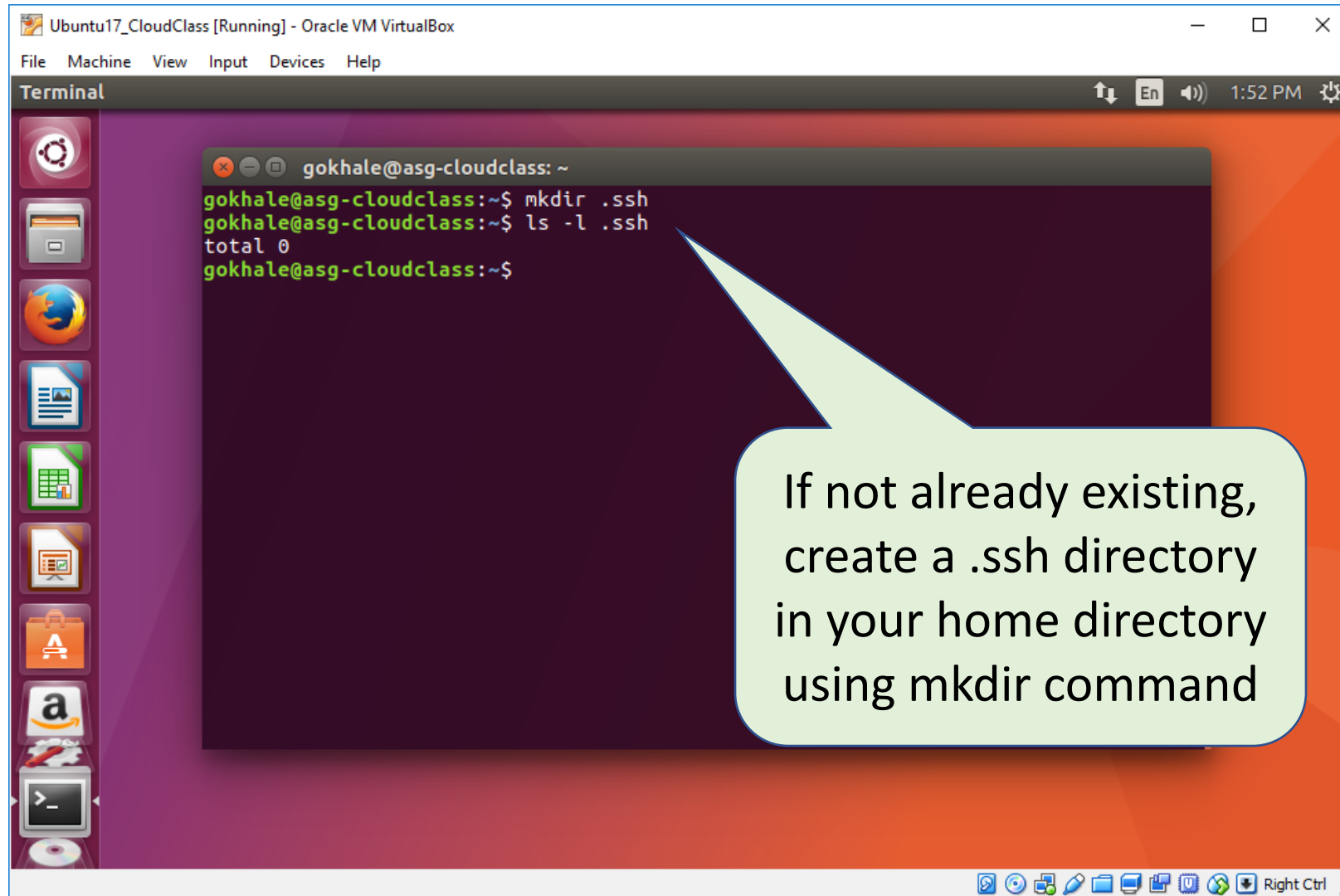
gokhale@asg-cloudclass: ~

```
gokhale@asg-cloudclass:~$ cd ~
gokhale@asg-cloudclass:~$ ls -la
total 128
drwxr-xr-x 15 gokhale gokhale 4096 Aug 18 13:50 .
drwxr-xr-x  3 root    root    4096 Aug 11 09:51 ..
-rw-r--r--  1 gokhale gokhale   17 Aug 11 12:47 .bash_aliases
-rw-----  1 gokhale gokhale  809 Aug 11 12:47 .bash_history
-rw-r--r--  1 gokhale gokhale  220 Aug 11 09:51 .bash_logout
-rw-r--r--  1 gokhale gokhale 3771 Aug 11 09:51 .bashrc
drwx----- 11 gokhale gokhale 4096 Aug 11 10:20 .cache
drwx-----  3 gokhale gokhale 4096 Aug 11 10:11 .compiz
drwx----- 13 gokhale gokhale 4096 Aug 11 10:02 .config
drwxr-xr-x  2 gokhale gokhale 4096 Aug 11 10:01 Desktop
-rw-r--r--  1 gokhale gokhale   25 Aug 11 10:01 .dmrc
drwxr-xr-x  2 gokhale gokhale 4096 Aug 11 10:01 Documents
drwxr-xr-x  2 gokhale gokhale 4096 Aug 11 10:01 Downloads
drwx-----  2 gokhale gokhale 4096 Aug 11 12:44 .emacs.d
-rw-r--r--  1 gokhale gokhale 8980 Aug 11 09:51 examples.desktop
-rw-----  1 gokhale gokhale 1400 Aug 11 11:27 .ICEauthority
drwxrwxr-x  3 gokhale gokhale 4096 Aug 11 10:01 .local
drwxr-xr-x  2 gokhale gokhale 4096 Aug 11 10:01 Music
drwxr-xr-x  2 gokhale gokhale 4096 Aug 11 10:01 Pictures
-rw-r--r--  1 gokhale gokhale  675 Aug 11 09:51 .profile
```

Is -la lists all the hidden directories and files also.

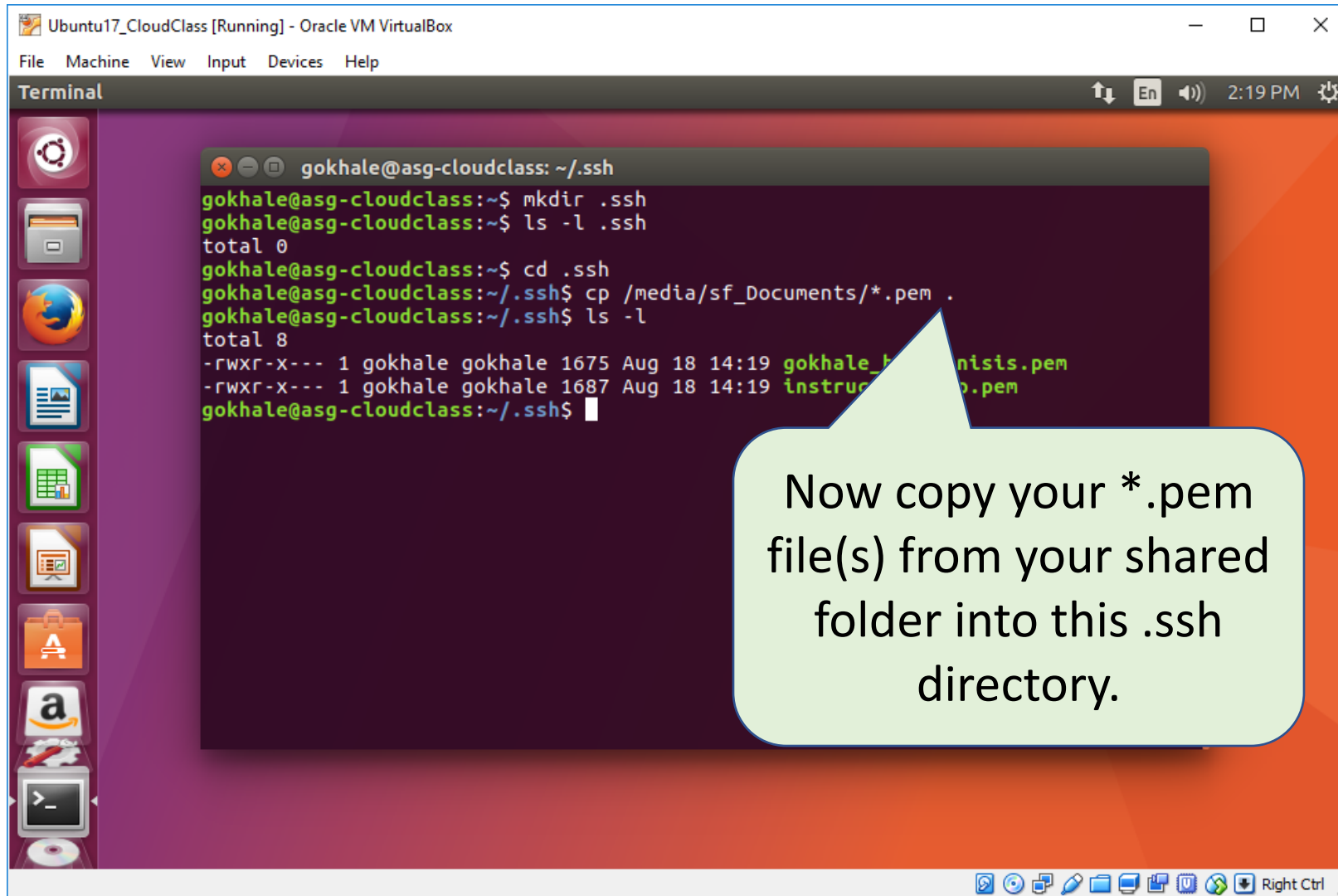
For Linux, I am going to use our laptop's VirtualBox-based Ubuntu VM.
For MAC, open a shell.

Remote SSH to VM from Linux/Mac (2/8)



- To go to home directory, type `cd ~` and press **Enter** on the shell prompt.

Remote SSH to VM From Linux/Mac (3/8)



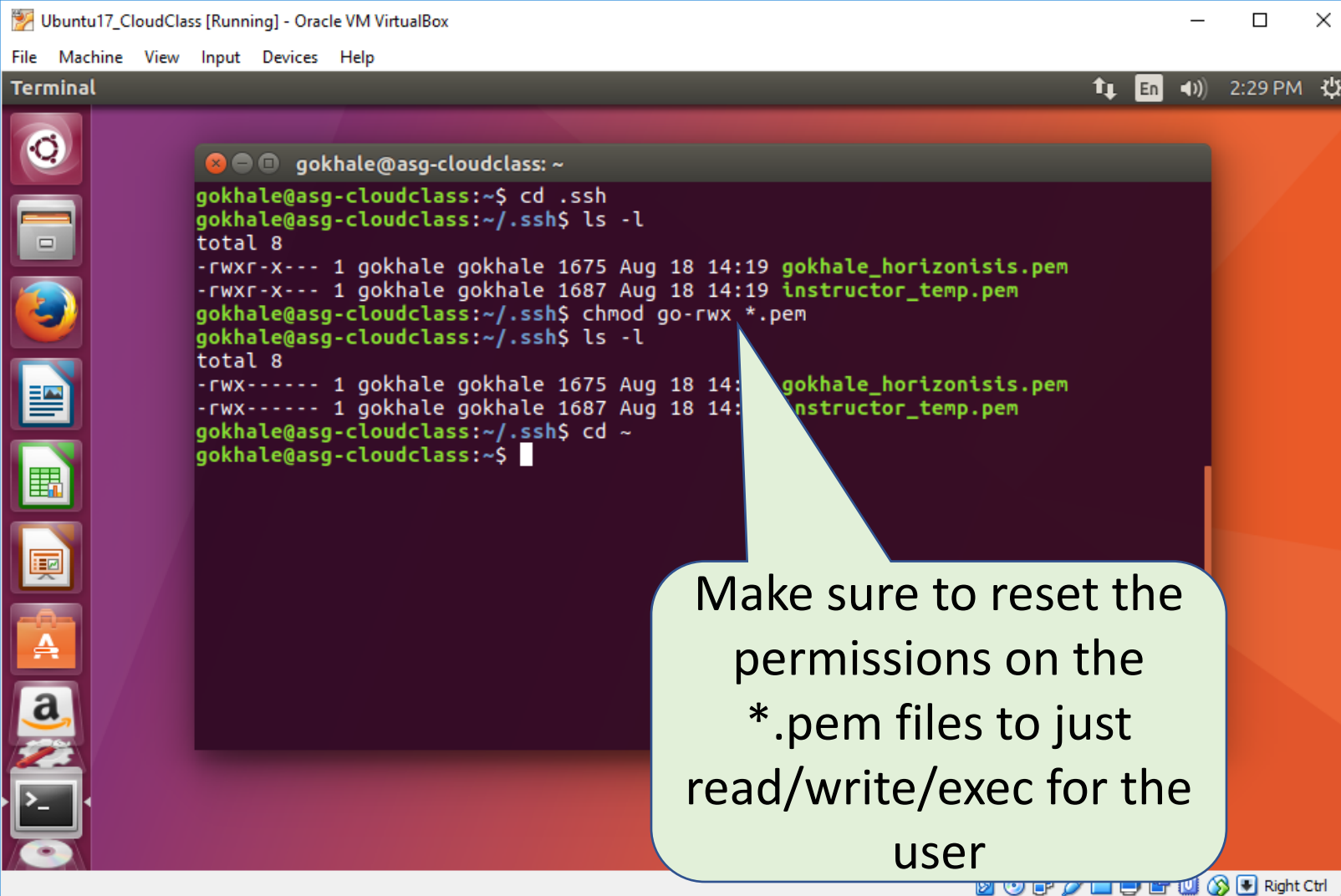
The screenshot shows a VirtualBox window titled 'Ubuntu17_CloudClass [Running] - Oracle VM VirtualBox'. Inside the VM, a terminal window is open with the following commands and output:

```
gokhale@asg-cloudclass: ~/.ssh
gokhale@asg-cloudclass:~$ mkdir .ssh
gokhale@asg-cloudclass:~$ ls -l .ssh
total 0
gokhale@asg-cloudclass:~$ cd .ssh
gokhale@asg-cloudclass:~/.ssh$ cp /media/sf_Documents/*.pem .
gokhale@asg-cloudclass:~/.ssh$ ls -l
total 8
-rwxr-x--- 1 gokhale gokhale 1675 Aug 18 14:19 gokhale_b...nisis.pem
-rwxr-x--- 1 gokhale gokhale 1687 Aug 18 14:19 instruc...o.pem
gokhale@asg-cloudclass:~/.ssh$
```

A callout bubble points to the terminal output with the text: "Now copy your *.pem file(s) from your shared folder into this .ssh directory."

- Refer to VirtualBox slides for how to set up and access your shared folder.

Remote SSH to VM From Linux/Mac (4/8)



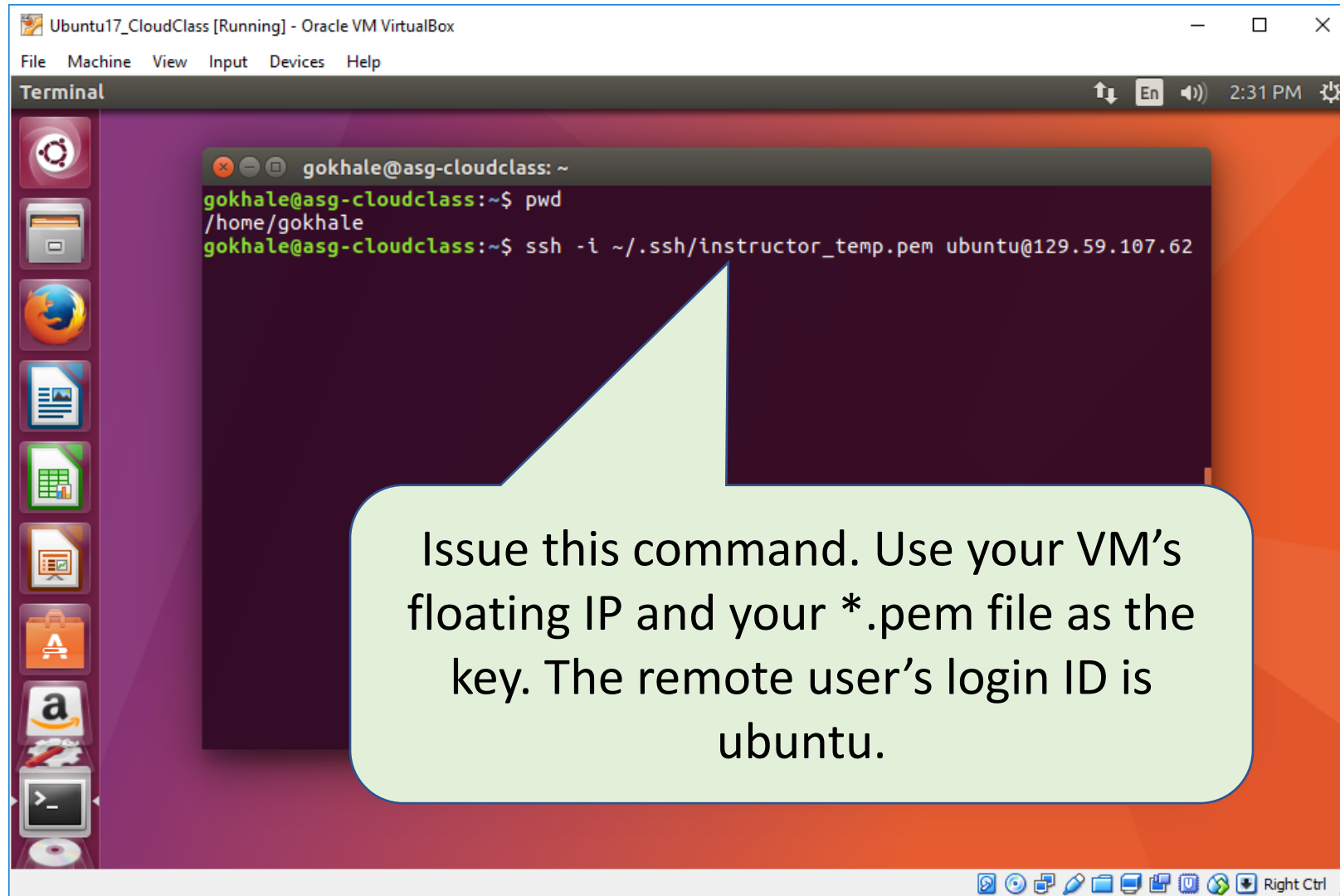
The screenshot shows a terminal window titled "Ubuntu17_CloudClass [Running] - Oracle VM VirtualBox". The terminal output is as follows:

```
gokhale@asg-cloudclass: ~  
gokhale@asg-cloudclass:~$ cd .ssh  
gokhale@asg-cloudclass:~/.ssh$ ls -l  
total 8  
-rwxr-x--- 1 gokhale gokhale 1675 Aug 18 14:19 gokhale_horizonisis.pem  
-rwxr-x--- 1 gokhale gokhale 1687 Aug 18 14:19 instructor_temp.pem  
gokhale@asg-cloudclass:~/.ssh$ chmod go-rwx *.pem  
gokhale@asg-cloudclass:~/.ssh$ ls -l  
total 8  
-rwx----- 1 gokhale gokhale 1675 Aug 18 14:19 gokhale_horizonisis.pem  
-rwx----- 1 gokhale gokhale 1687 Aug 18 14:19 instructor_temp.pem  
gokhale@asg-cloudclass:~/.ssh$ cd ~  
gokhale@asg-cloudclass:~$
```

A callout bubble points to the `chmod go-rwx *.pem` command with the text: "Make sure to reset the permissions on the *.pem files to just read/write/exec for the user".

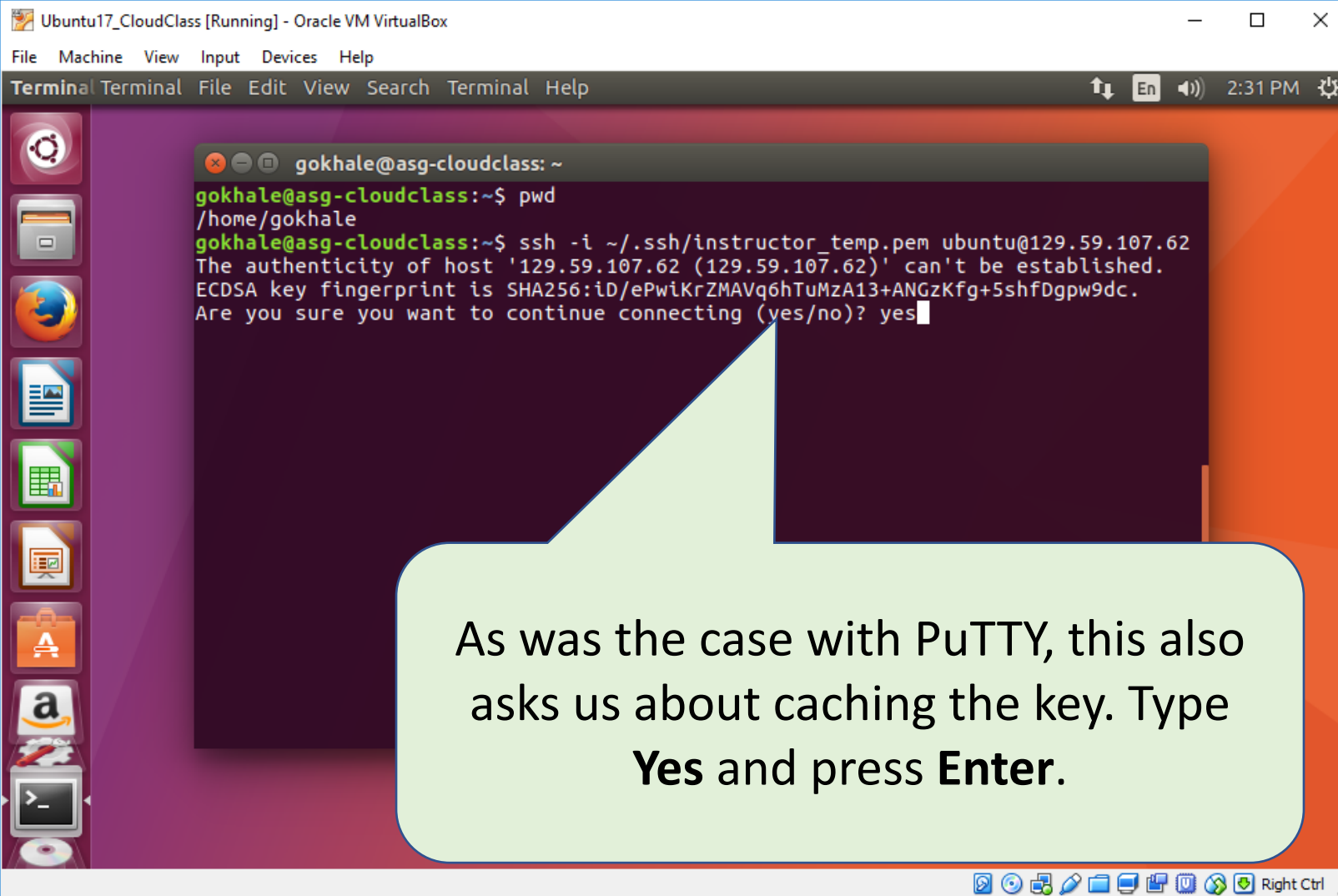
- `chmod` is the command to change permissions.
- `g,o` are for group and others; the `-rwx` removes read/write/exec for group and others.

Remote SSH to VM From Linux/Mac (5/8)



- ssh is the command to connect to remote machine.
- -i option is to provide a path to the key; ~/ refers to “starting from home directory.”

Remote SSH to VM From Linux/Mac (6/8)

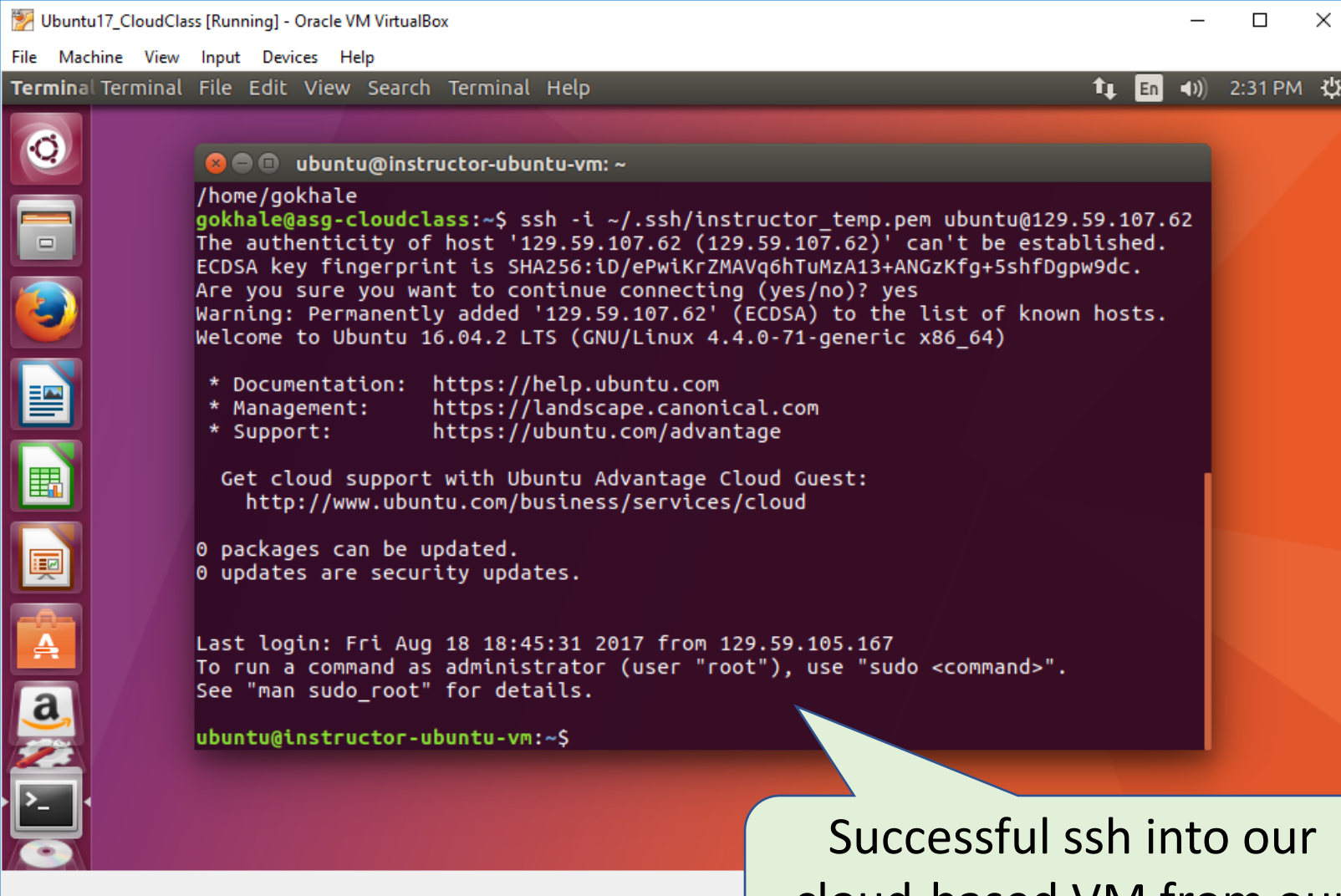


```
gokhale@asg-cloudclass: ~  
gokhale@asg-cloudclass:~$ pwd  
/home/gokhale  
gokhale@asg-cloudclass:~$ ssh -i ~/.ssh/instructor_temp.pem ubuntu@129.59.107.62  
The authenticity of host '129.59.107.62 (129.59.107.62)' can't be established.  
ECDSA key fingerprint is SHA256:ID/ePwiKrZMAVq6hTuMzA13+ANGzKfg+5shfDgpw9dc.  
Are you sure you want to continue connecting (yes/no)? yes
```

As was the case with PuTTY, this also asks us about caching the key. Type **Yes** and press **Enter**.

- ssh is the command to connect to remote machine
- -i option is to provide a path to the key; ~/ refers to “starting from home directory.”

Remote SSH to VM From Linux/Mac (7/8)



The screenshot shows a VirtualBox window titled "Ubuntu17_CloudClass [Running] - Oracle VM VirtualBox". Inside the VM, a terminal window is open with the prompt "ubuntu@instructor-ubuntu-vm: ~". The terminal shows the execution of the command "ssh -i ~/.ssh/instructor temp.pem ubuntu@129.59.107.62". The output of the command is as follows:

```
gokhale@asg-cloudclass:~$ ssh -i ~/.ssh/instructor temp.pem ubuntu@129.59.107.62
The authenticity of host '129.59.107.62 (129.59.107.62)' can't be established.
ECDSA key fingerprint is SHA256:ID/ePwiKrZMAVq6hTuMzA13+ANGzKfg+5shfDgpw9dc.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '129.59.107.62' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 16.04.2 LTS (GNU/Linux 4.4.0-71-generic x86_64)

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 * Management:    https://landscape.canonical.com
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Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud

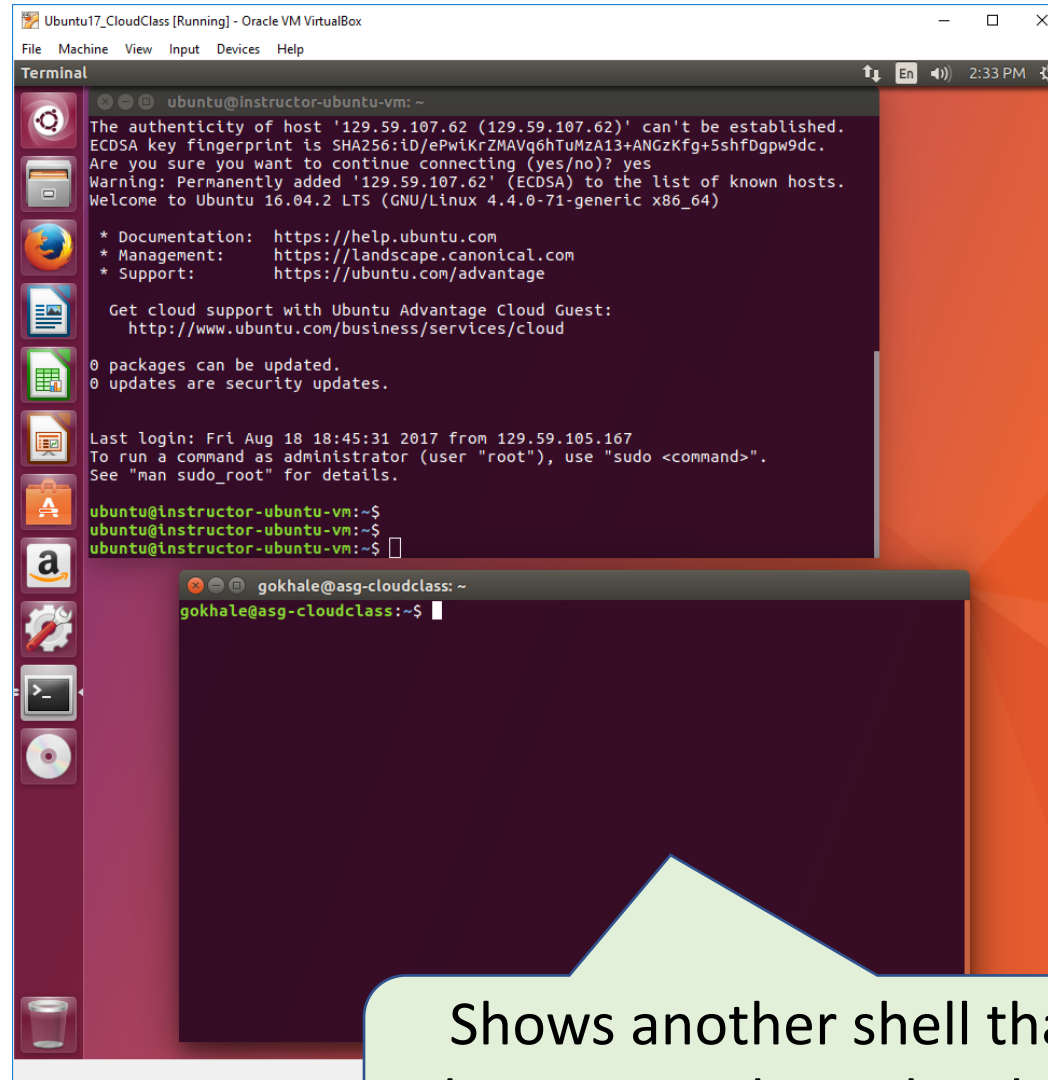
0 packages can be updated.
0 updates are security updates.

Last login: Fri Aug 18 18:45:31 2017 from 129.59.105.167
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@instructor-ubuntu-vm:~$
```

Successful ssh into our cloud-based VM from our laptop-based VM 😊

Remote SSH to VM From Linux/Mac (8/8)



```
Ubuntu17_CloudClass [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Terminal
ubuntu@instructor-ubuntu-vm: ~
The authenticity of host '129.59.107.62 (129.59.107.62)' can't be established.
ECDSA key fingerprint is SHA256:ID/ePwIKrZMAVq6hTuMzA13+ANGzKfg+SshfDgpw9dc.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '129.59.107.62' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 16.04.2 LTS (GNU/Linux 4.4.0-71-generic x86_64)

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To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@instructor-ubuntu-vm:~$
ubuntu@instructor-ubuntu-vm:~$
ubuntu@instructor-ubuntu-vm:~$

gokhale@asg-cloudclass: ~
gokhale@asg-cloudclass:~$
```

Shows another shell that I opened on my laptop VM that is local whereas the other shell is the SSH session.

Running Some Commands on Remote VM

cc@gokhale-fall18-vm: ~

```
cc@gokhale-fall18-vm:~$ who
cc      ttyS0      2018-09-09 18:19
cc      pts/0      2018-09-09 19:34 (209.30.118.72)
cc@gokhale-fall18-vm:~$ which python
/usr/bin/python
cc@gokhale-fall18-vm:~$ which python3
/usr/bin/python3
cc@gokhale-fall18-vm:~$ which pip
cc@gokhale-fall18-vm:~$
cc@gokhale-fall18-vm:~$ which gcc
/usr/bin/gcc
cc@gokhale-fall18-vm:~$ which g++
/usr/bin/g++
cc@gokhale-fall18-vm:~$ uname -a
Linux gokhale-fall18-vm 4.4.0-121-generic #145-Ubuntu SMP Fri Apr 13 13:47:23 UT
C 2018 x86_64 x86_64 x86_64 GNU/Linux
cc@gokhale-fall18-vm:~$ ifconfig
ens3      Link encap:Ethernet  HWaddr fa:16:3e:ee:30:f5
          inet addr:192.168.2.127  Bcast:192.168.2.255  Mask:255.255.255.0
          inet6 addr: fe80::f816:3eff:feee:30f5/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:1820 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2160 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:579399 (579.3 KB)  TX bytes:227205 (227.2 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:50 errors:0 dropped:0 overruns:0 frame:0
          TX packets:50 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:4010 (4.0 KB)  TX bytes:4010 (4.0 KB)

cc@gokhale-fall18-vm:~$ █
```

Remote SSH to VM

The End