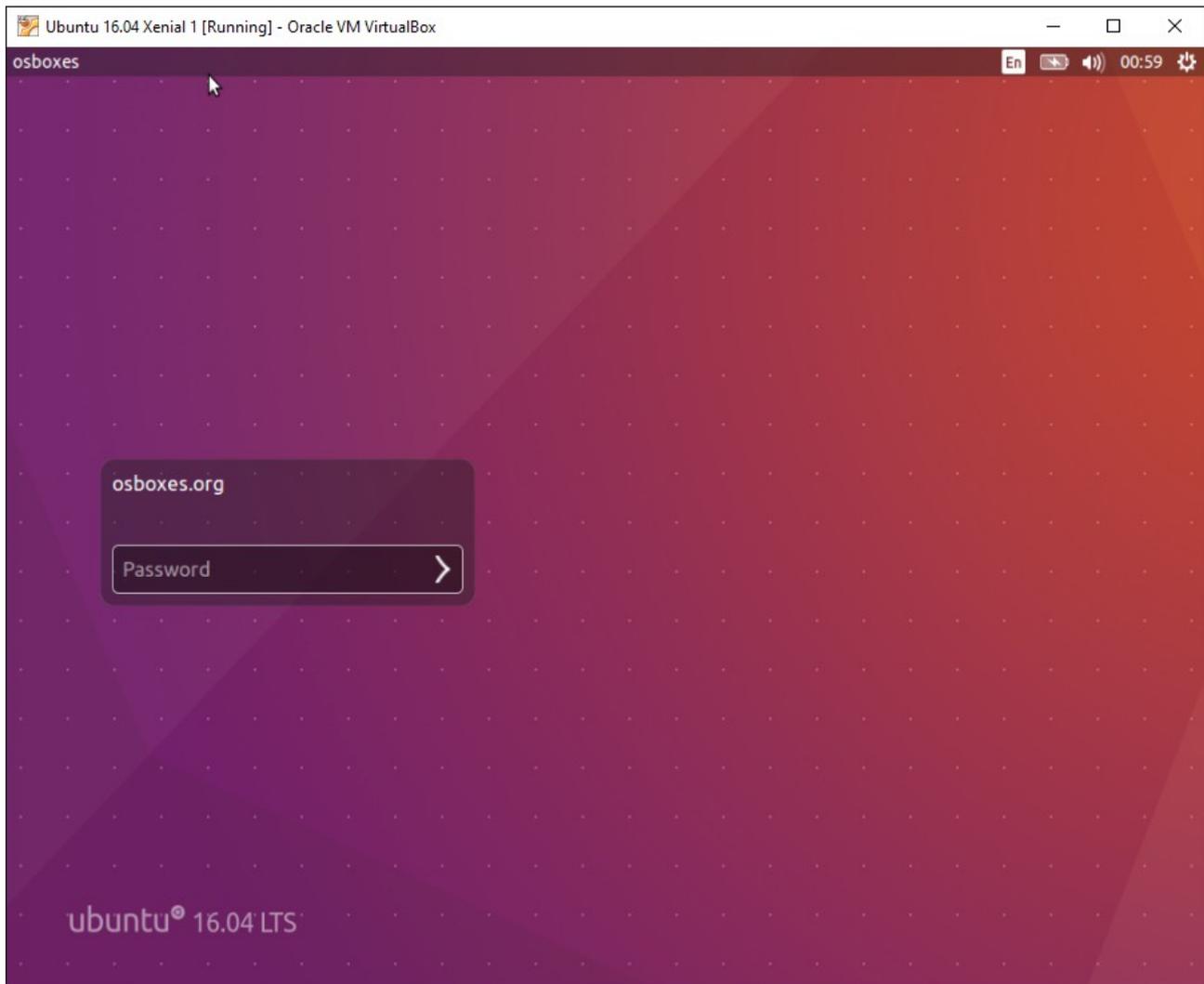


## How to use apt-get to update Ubuntu

Revised: 15-August-2016

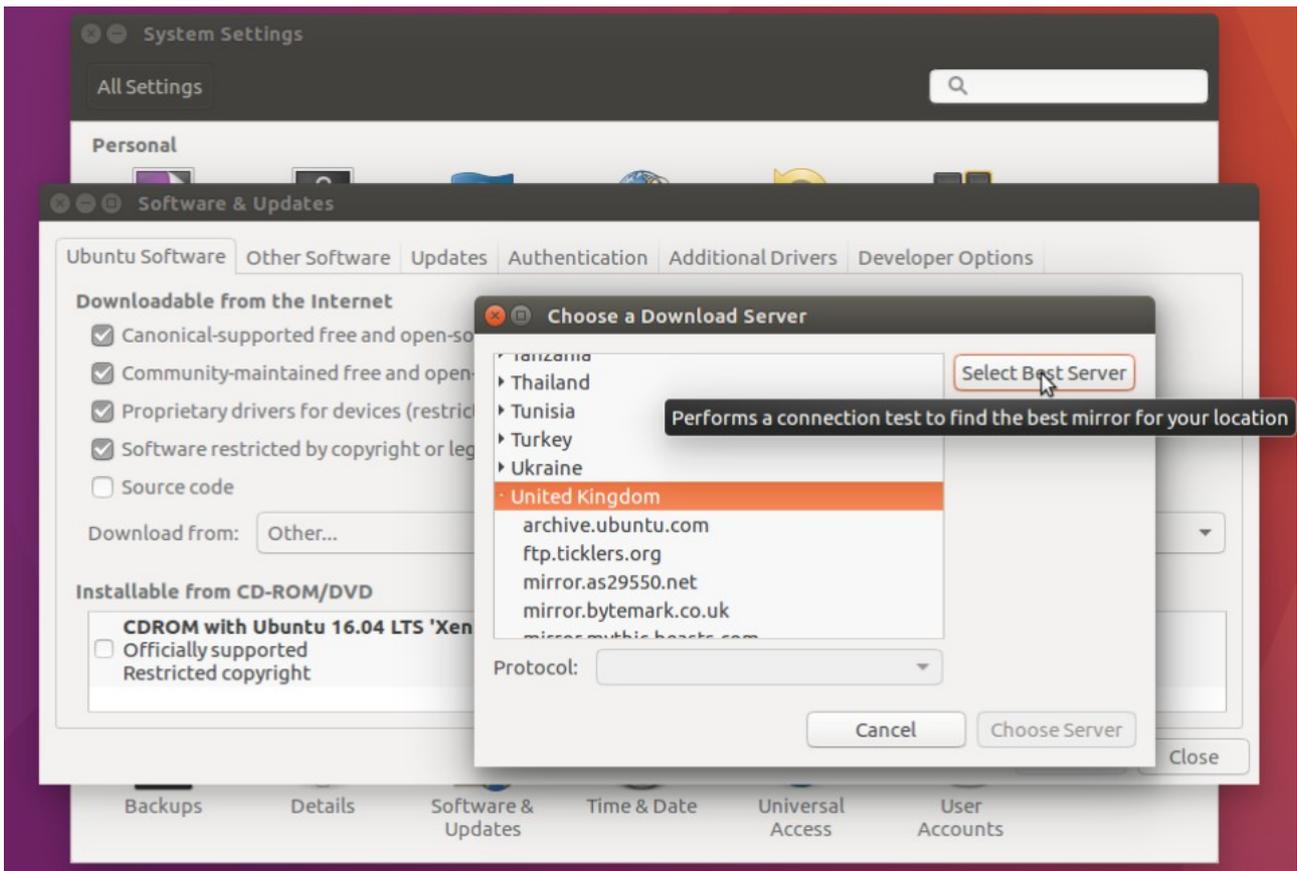
In our last two "How To" documents, we stepped through installing Oracle VirtualBox and Ubuntu 16.04 as a guest OS. This document how to apply updates to the Ubuntu operating system using the apt-get utility.

Start the Ubuntu Linux VM in VirtualBox. In the VM X Window session, logon as the default user osboxes.



We are going to demonstrate using the command line utility "apt" to retrieve and install updates. But before we do that, we can use the GUI utility for applying updates to select the best mirror server from which to download packages.

Select the "System Settings" icon (Gear and Wrench) from the Ubuntu menu. Then, select Software & Updates. Click on the drop-down menu for "Download from" on the Ubuntu Software tab and select "Other". In the "Choose a Download Server" dialog, click on the Select Best Server button. This will initiate timing tests and recommend a server to use. Select the recommended server and exit the dialog windows.



Now, right-click in the workspace and select "Open Terminal." Enter the command "sudo apt update". This will update package lists, identifying which packages can be upgraded.

```
osboxes@osboxes:~$ sudo apt update
[sudo] password for osboxes:
Get:1 http://security.ubuntu.com/ubuntu xenial-security InRelease [94.5 kB]
Get:2 http://gb.archive.ubuntu.com/ubuntu xenial InRelease [247 kB]
Get:3 http://gb.archive.ubuntu.com/ubuntu xenial-updates InRelease [95.7 kB]
Get:4 http://security.ubuntu.com/ubuntu xenial-security/main amd64 Packages [123 kB]
Get:5 http://gb.archive.ubuntu.com/ubuntu xenial-backports InRelease [92.2 kB]
Get:6 http://gb.archive.ubuntu.com/ubuntu xenial/main amd64 Packages [1,201 kB]
```

```
Reading package lists... Done
Building dependency tree
Reading state information... Done
349 packages can be upgraded. Run 'apt list --upgradable' to see them.
osboxes@osboxes:~$
```

Next, enter "sudo apt full-upgrade". This will list the packages ready to be downloaded and applied. You will be prompted to continue by hitting Enter. Or, enter "n" and hit Enter to avoid applying the updates.

Note that apt also identified two packages that can be removed. We will do that after the updates are installed.

```
osboxes@osboxes:~$ sudo apt full-upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following packages were automatically installed and are no longer required:
  libpango1.0-0 libpangox-1.0-0
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  linux-headers-4.4.0-31 linux-headers-4.4.0-31-generic linux-image-4.4.0-31-generic
  linux-image-extra-4.4.0-31-generic
The following packages will be upgraded:
  accountsservice adium-theme-ubuntu adwaita-icon-theme apport apport-gtk appstream apt
  apt-transport-https apt-utils apturl apturl-common bamfdaemon base-files bash bash-completion
  bind9-host binutils brltty bsduutils command-not-found command-not-found-data compiz compiz-core
349 to upgrade, 4 to newly install, 0 to remove and 0 not to upgrade.
Need to get 527 MB of archives.
After this operation, 340 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

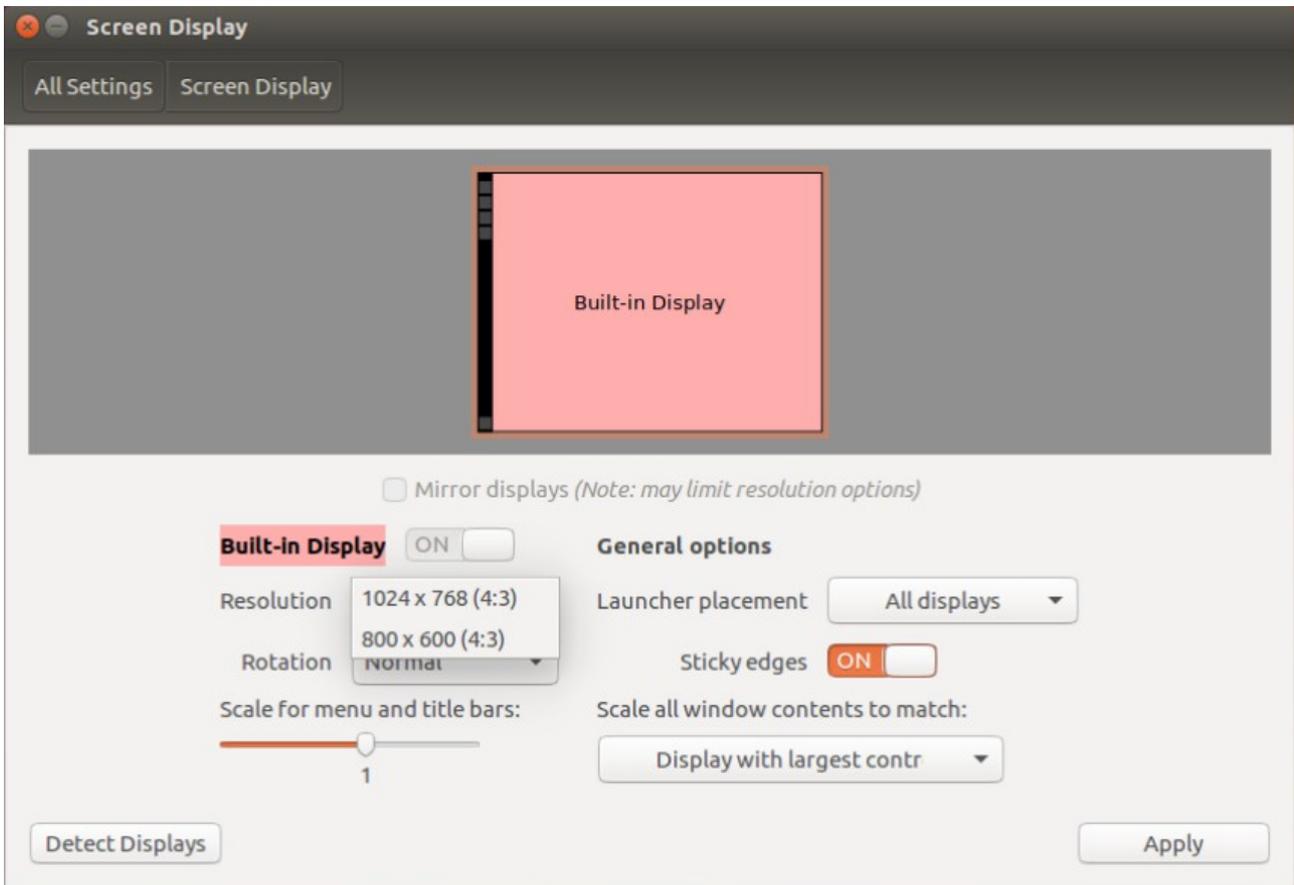
After pressing Enter, the updates will be downloaded and installed.

After the installation is complete, we can confirm that there are no longer any pending upgrades by entering "sudo apt full-upgrade" again. It reports nothing remaining to upgrade.

```
osboxes@osboxes:~$ sudo apt full-upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following packages were automatically installed and are no longer required:
  libpango1.0-0 libpangox-1.0-0
Use 'sudo apt autoremove' to remove them.
0 to upgrade, 0 to newly install, 0 to remove and 0 not to upgrade.
osboxes@osboxes:~$
```

Now the basic Ubuntu distribution included by OSBoxes has been updated. Next, we will install some additional packages that are useful.

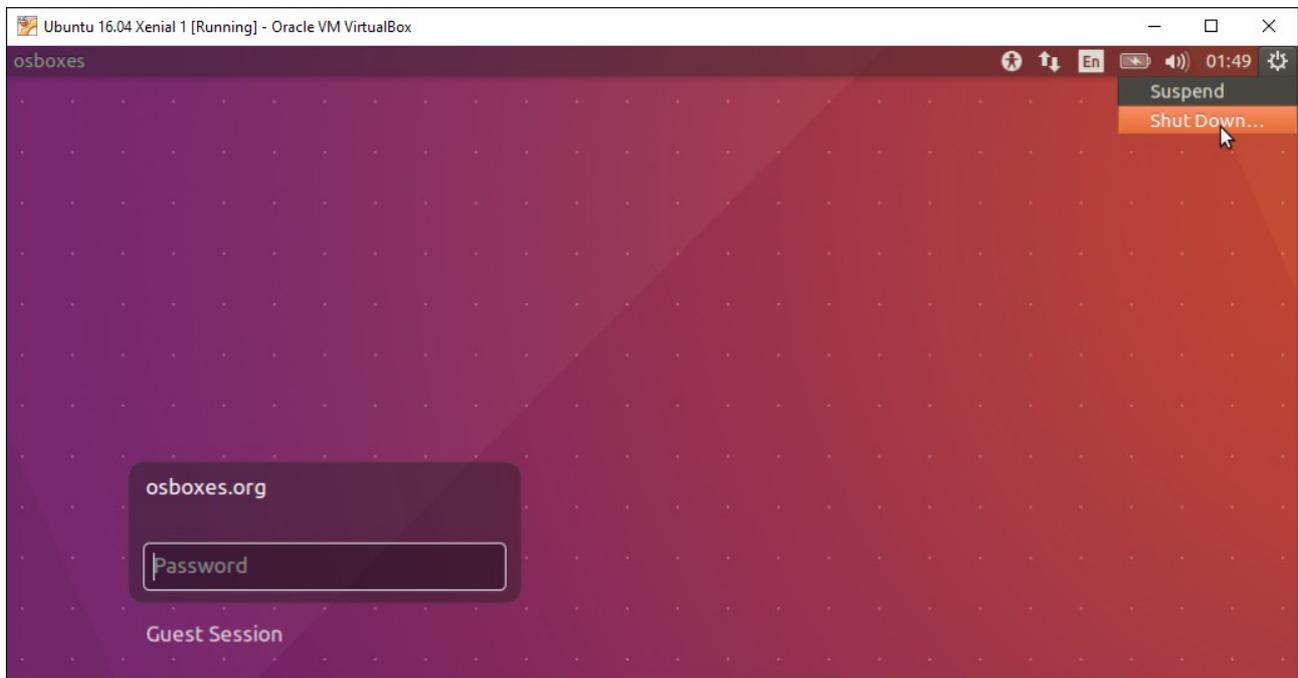
As mentioned above, the default OSBoxes Ubuntu VM distribution supports only a limited number of display resolutions. You can see this by selecting the Screen Display icon from the System Settings menu.



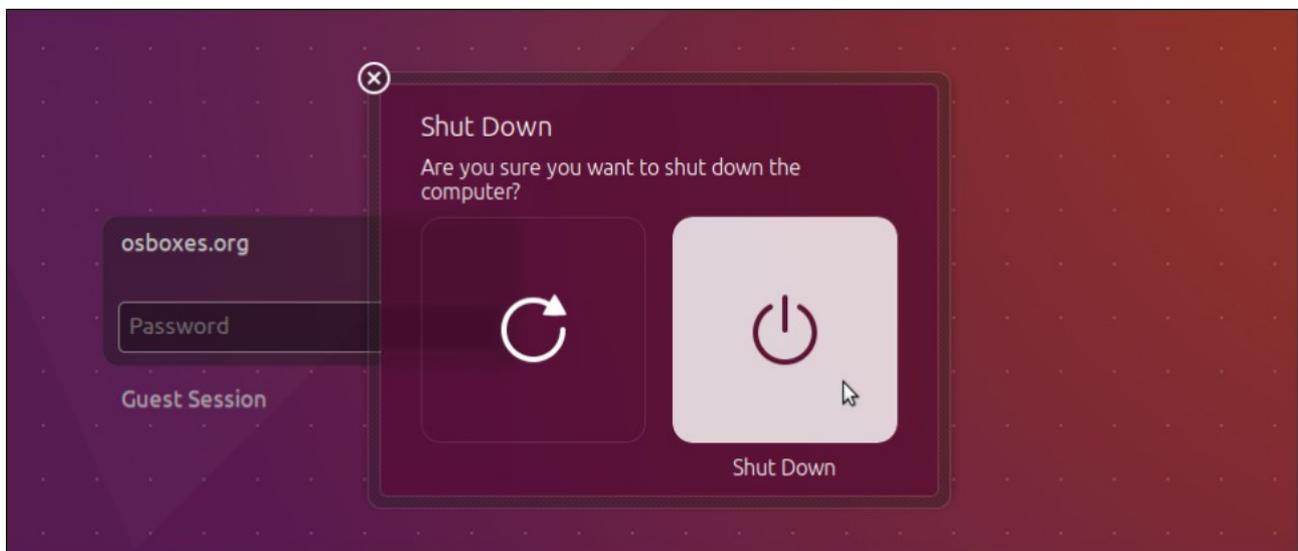
To add support for larger displays, we will install Guest OS utilities provided by OSBoxes. Enter the following command from a terminal window to install three packages: "sudo apt install virtualbox-guest-utils virtualbox-guest-x11 virtualbox-guest-dkms".

```
osboxes@osboxes:~$ sudo apt install virtualbox-guest-utils virtualbox-guest-x11 virtualbox-guest-dkms
[sudo] password for osboxes:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libpango1.0-0 libpangox-1.0-0
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  dkms
The following NEW packages will be installed:
  dkms virtualbox-guest-dkms virtualbox-guest-utils virtualbox-guest-x11
0 to upgrade, 4 to newly install, 0 to remove and 0 not to upgrade.
Need to get 2,046 kB of archives.
After this operation, 13.3 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

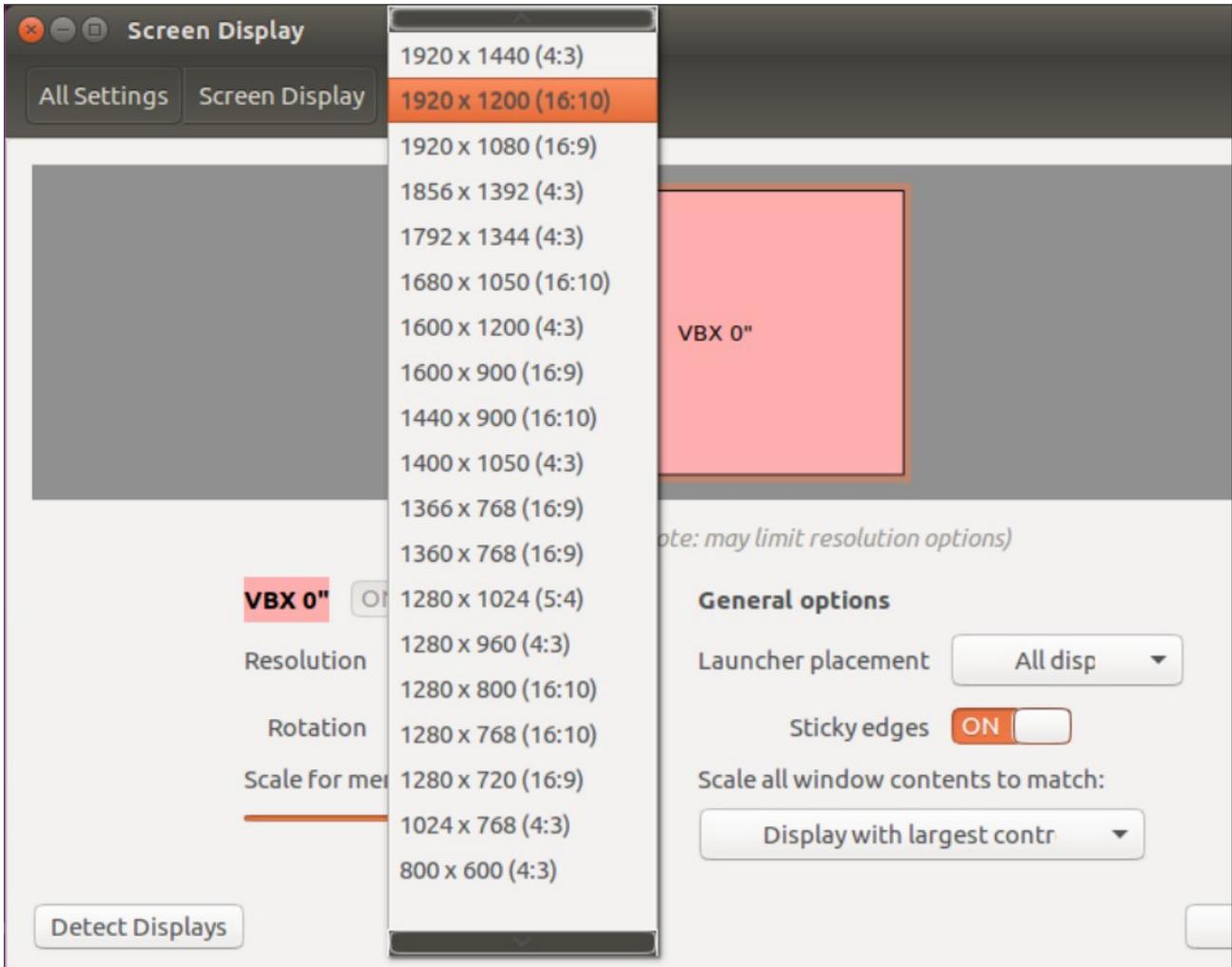
After installing the VirtualBox guest utilities, you can update the VM display settings to dimensions larger than 1024x768. To do this, you will need to log off, then select Shut Down from the settings menu - the gear at the upper right corner of the GUI.



In the Shut Down dialog, select "Shut Down".



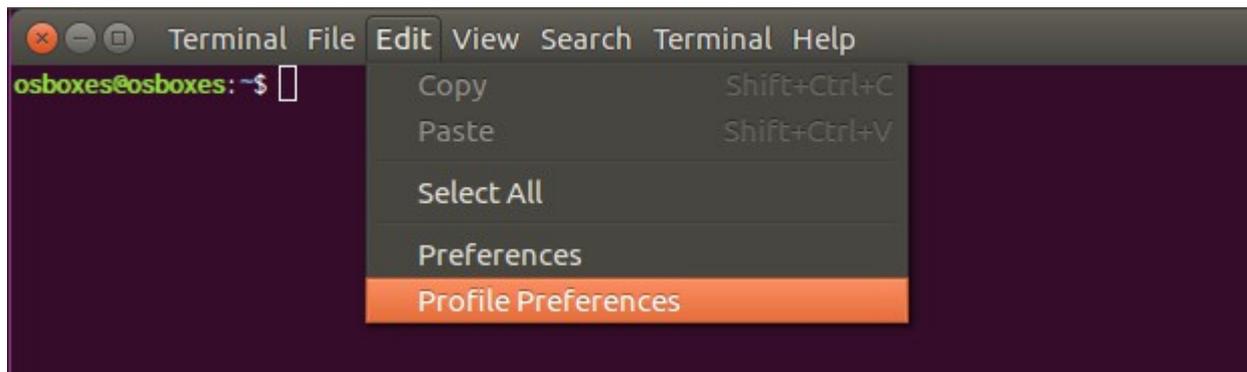
Restart the Ubuntu guest OS. Log on as osboxes. Select the "System Settings" option from the settings menu. Select Screen Display. Select the Resolution drop-down menu and select the appropriate screen resolution.



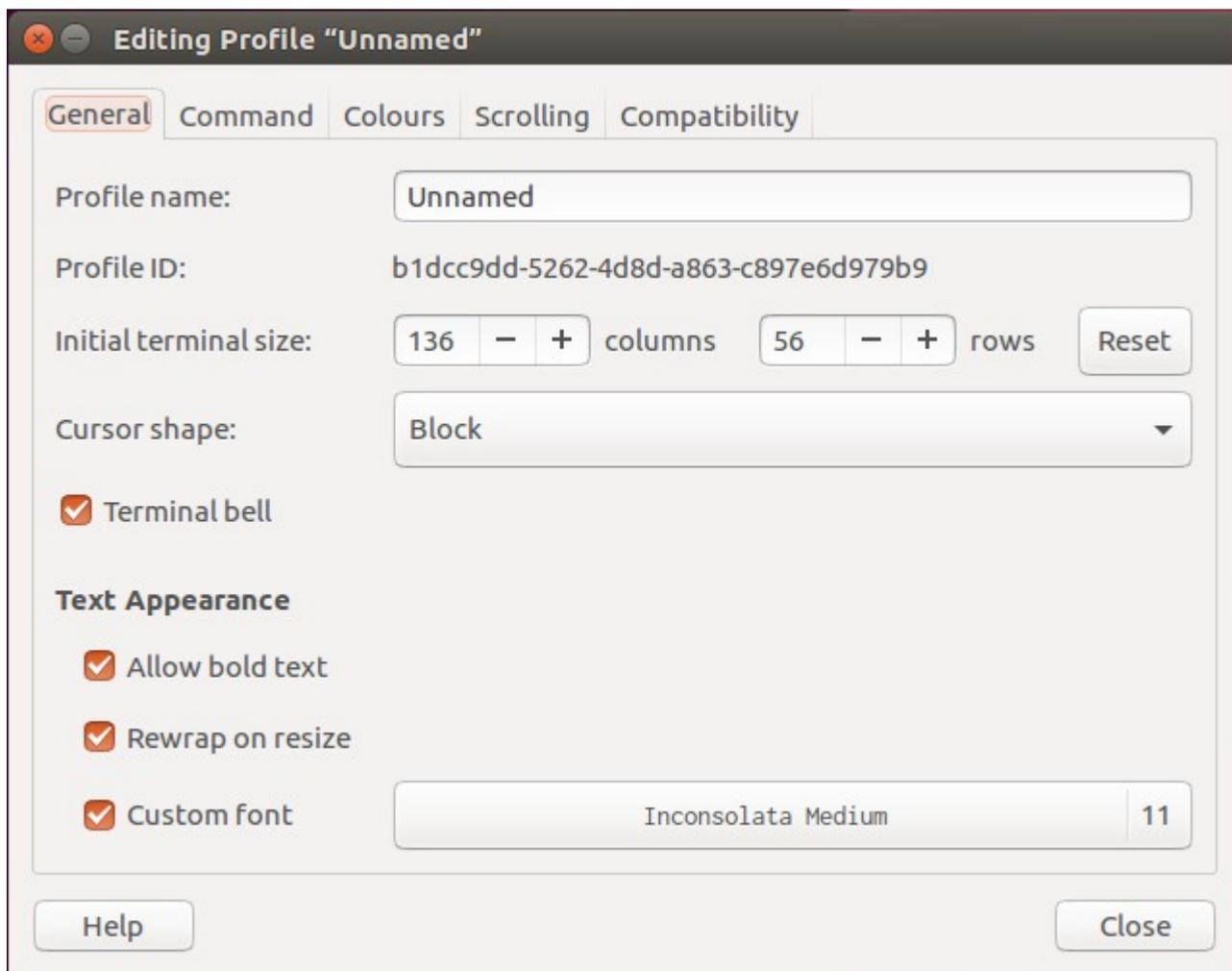
Next, we will demonstrate installing a new font. Here, we install Inconsolata fonts, which are popular with developers. The command entered is "sudo apt install fonts-inconsolata".

```
osboxes@osboxes:~$ sudo apt install fonts-inconsolata
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libpango1.0-0 libpangox-1.0-0
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  fonts-inconsolata
0 to upgrade, 1 to newly install, 0 to remove and 0 not to upgrade.
Need to get 61.8 kB of archives.
After this operation, 139 kB of additional disk space will be used.
Get:1 http://mirror.lstn.net/ubuntu xenial/universe amd64 fonts-inconsolata all 001.010-5 [61.8 kB]
Fetched 61.8 kB in 1s (51.9 kB/s)
Selecting previously unselected package fonts-inconsolata.
(Reading database ... 205213 files and directories currently installed.)
Preparing to unpack .../fonts-inconsolata_001.010-5_all.deb ...
Unpacking fonts-inconsolata (001.010-5) ...
Processing triggers for fontconfig (2.11.94-0ubuntu1) ...
Setting up fonts-inconsolata (001.010-5) ...
osboxes@osboxes:~$
```

After installing Inconsolata fonts, you can change the font used by the Terminal by selecting the Edit|Profile Preferences menu option in Terminal to open the Profile Preferences dialog.



Then, check the custom font checkbox and select one of the Inconsolata fonts.



Note also that on this dialog, I have also updated the "Initial terminal size:" columns and rows values, to set the initial size of the terminal window.

Next, we will install a commonly used network utility that is not included by default in the Ubuntu distribution. We install the traceroute networking utility with the following command.

```
sudo apt install traceroute
```

Test the traceroute utility using a domain name.

```
osboxes@osboxes:~$ traceroute www.google.com
traceroute to www.google.com (216.58.195.228), 30 hops max, 60 byte packets
 1 192.168.43.1 (192.168.43.1) 5.921 ms 5.943 ms 6.378 ms
 2 145.sub-66-174-43.myvzw.com (66.174.43.145) 39.398 ms 44.419 ms 45.332 ms
 3 52.sub-69-83-106.myvzw.com (69.83.106.52) 48.184 ms 48.901 ms 58.977 ms
 4 66.sub-69-83-106.myvzw.com (69.83.106.66) 61.174 ms 61.454 ms 63.503 ms
 5 2.sub-69-83-107.myvzw.com (69.83.107.2) 74.608 ms 79.571 ms 80.310 ms
 6 104.sub-69-83-96.myvzw.com (69.83.96.104) 91.080 ms 64.464 ms 79.782 ms
 7 69.sub-69-83-96.myvzw.com (69.83.96.69) 77.291 ms 83.583 ms 93.301 ms
 8 et-4-1-1.ER1.DFW2.us.above.net (208.185.155.181) 83.812 ms 93.688 ms 93.559 ms
 9 72.14.194.53 (72.14.194.53) 118.658 ms 119.158 ms 119.444 ms
10 108.170.240.195 (108.170.240.195) 104.184 ms 108.170.240.131 (108.170.240.131) 119.136 ms 118.643 ms
11 72.14.237.221 (72.14.237.221) 100.412 ms 104.161 ms 72.14.237.219 (72.14.237.219) 100.659 ms
12 209.85.241.26 (209.85.241.26) 85.015 ms 209.85.241.28 (209.85.241.28) 68.408 ms 110.407 ms
13 216.239.46.241 (216.239.46.241) 109.855 ms 109.950 ms 216.239.46.213 (216.239.46.213) 110.747 ms
14 209.85.246.39 (209.85.246.39) 110.309 ms 209.85.246.21 (209.85.246.21) 112.773 ms 209.85.246.39 (209.85.246.39) 113.573 ms
15 108.170.232.125 (108.170.232.125) 112.487 ms 112.821 ms 113.940 ms
16 sfo03s06-in-f4.1e100.net (216.58.195.228) 114.747 ms 114.835 ms 116.035 ms
osboxes@osboxes:~$
```

Next, we will install OpenSSH Server. This will provide our Ubuntu installation with SSH and SFTP capability. This "How To" will only begin our SSH configuration however. Completing the SSH configuration and securing our server will be discussed in a separate "How To".

```
sudo apt install openssh-server
```

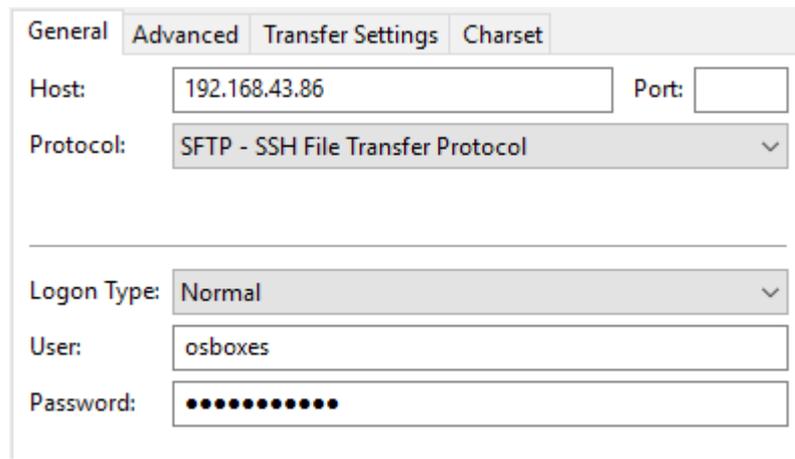
After installing the OpenSSH Server, verify that the ssh service is running by entering

```
service --status-all
```

Verify that SSH is listening on the default port, port 22.

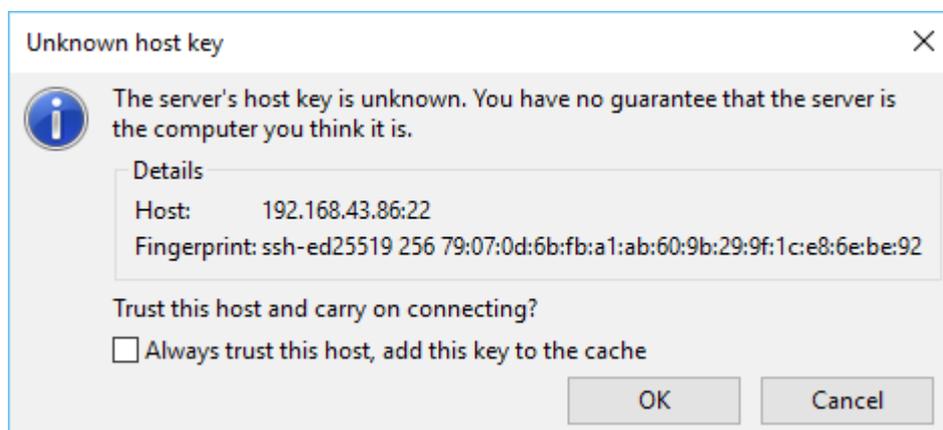
```
osboxes@osboxes:~$ netstat -an | grep ":22"
tcp        0      0 0.0.0.0:22          0.0.0.0:*          LISTEN
tcp6       0      0 :::22              :::*                LISTEN
osboxes@osboxes:~$
```

Now, we need to verify that an SSH connection can be made to Ubuntu. In our case, we will use the FileZilla program to open an SFTP connection to our VM. We will define a new connection to our server using SFTP. Enter the osboxes user and the osboxes.org password.

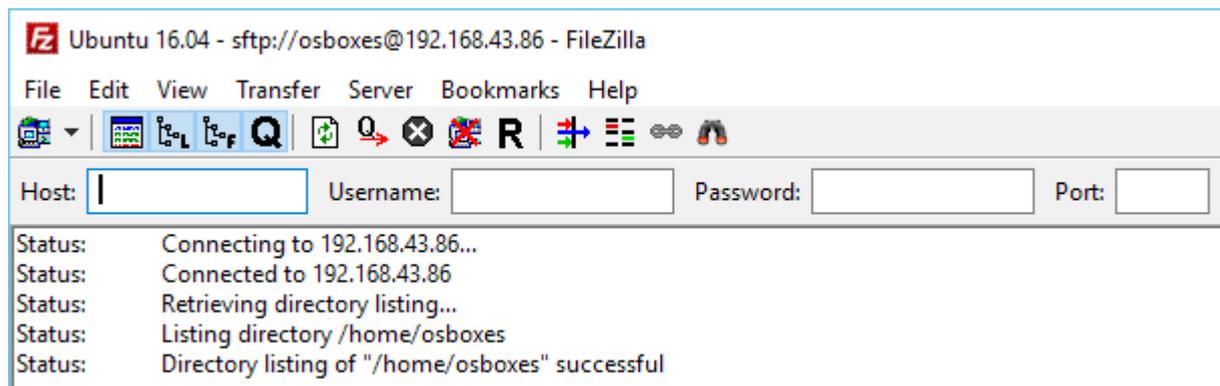


The image shows the FileZilla connection settings dialog box. It has four tabs: General, Advanced, Transfer Settings, and Charset. The General tab is selected. The Host field contains '192.168.43.86' and the Port field is empty. The Protocol dropdown menu is set to 'SFTP - SSH File Transfer Protocol'. Below a horizontal separator, the Logon Type dropdown is set to 'Normal'. The User field contains 'osboxes' and the Password field is filled with 12 black dots.

The server key presented by Ubuntu is created during the installation of OpenSSH Server. This connection will be used to upload a client certificate during our processing of hardening security in a later "How To" article. For now, we only want to confirm that the connection can be made. Ideally, we do not want the default osboxes account to have SSH access to the VM. We will later create a dedicated account with limited access for use with SSH.



Once connected, FileZilla's status window indicates that the connection was successful.



In our Ubuntu user session, we can confirm the SFTP connection also using netstat. Here, our Windows 10 host is acting as the client. It has connected to our Ubuntu server and established the SFTP session. The source port, 56541, is "ethereal" - that is, it is sequentially assigned by the client during session establishment.

```
osboxes@osboxes:~$ netstat -an | grep ":22"
tcp        0      0 0.0.0.0:22          0.0.0.0:*          LISTEN
tcp        0      0 192.168.43.86:22   192.168.43.102:59748 ESTABLISHED
tcp6       0      0 :::22             :::*                LISTEN
osboxes@osboxes:~$
```

Lastly, for this "How To", we will remove any packages that had been installed but due to upgrades may now no longer be needed. In our case, two packages are eligible for removal.

```
osboxes@osboxes:~$ sudo apt autoremove
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages will be REMOVED
  libpango1.0-0 libpangox-1.0-0
0 to upgrade, 0 to newly install, 2 to remove and 0 not to upgrade.
After this operation, 386 kB disk space will be freed.
Do you want to continue? [Y/n]
```

After confirming, the two packages are removed.

```
(Reading database ... 208001 files and directories currently installed.)
Removing libpango1.0-0:amd64 (1.38.1-1) ...
Removing libpangox-1.0-0:amd64 (0.0.2-5) ...
Processing triggers for libc-bin (2.23-0ubuntu3) ...
osboxes@osboxes:~$
```

Now, our Ubuntu client is installed, connected to the Internet, updated and minimally configured. In a later "How To", we will apply additional configuration changes to improve its security.