

# Lab Assignment



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Cybersecurity Professional Program  
Introductory Course

## Linux OS

**IC-05-L1**

**Kali Linux Installation**

## Lab Objective

Become familiar with setting up virtual machines and Kali Linux installations.

## Lab Mission

Learn how to install Kali Linux on a virtual machine.

## Lab Duration

45–60 minutes

## Requirements

- Basic working knowledge of VirtualBox

## Resources

- Environment & Tools
  - VirtualBox
- Extra Lab Files
  - ***Kali-linux-2020.3-installer-amd64.iso***

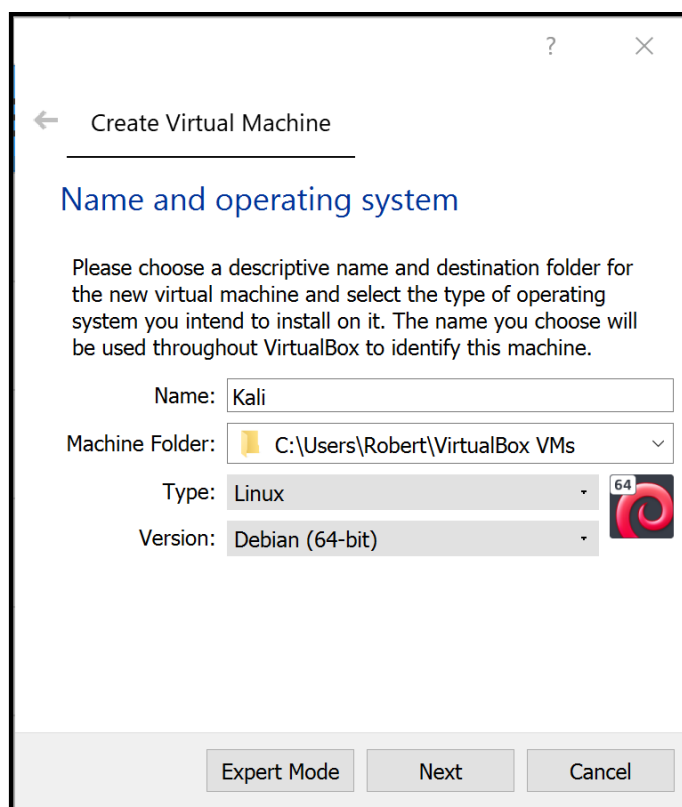
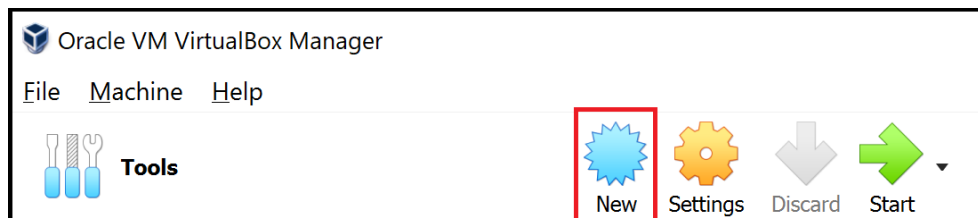
## Textbook References

- Chapter 5: Linux OS
  - Section 1: Introduction

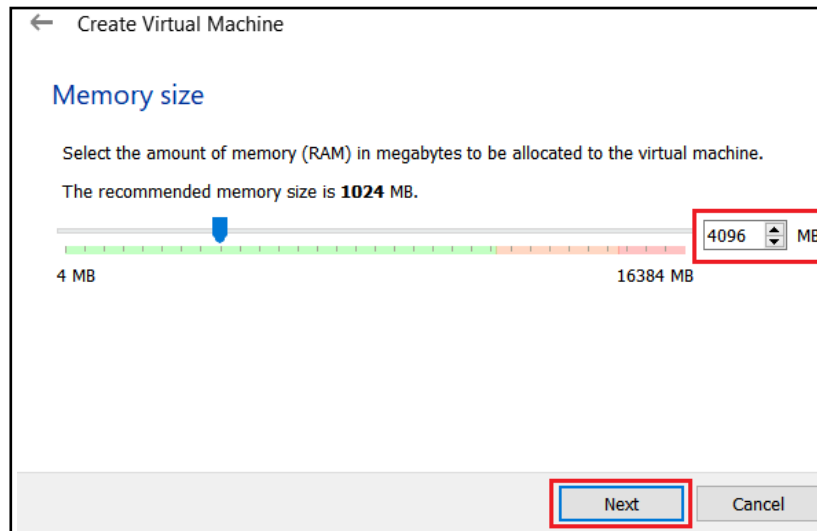
## Lab Task 1: Configure VirtualBox for Kali Linux Installation

In this task, you will prepare a virtual machine for Kali Linux OS installation.

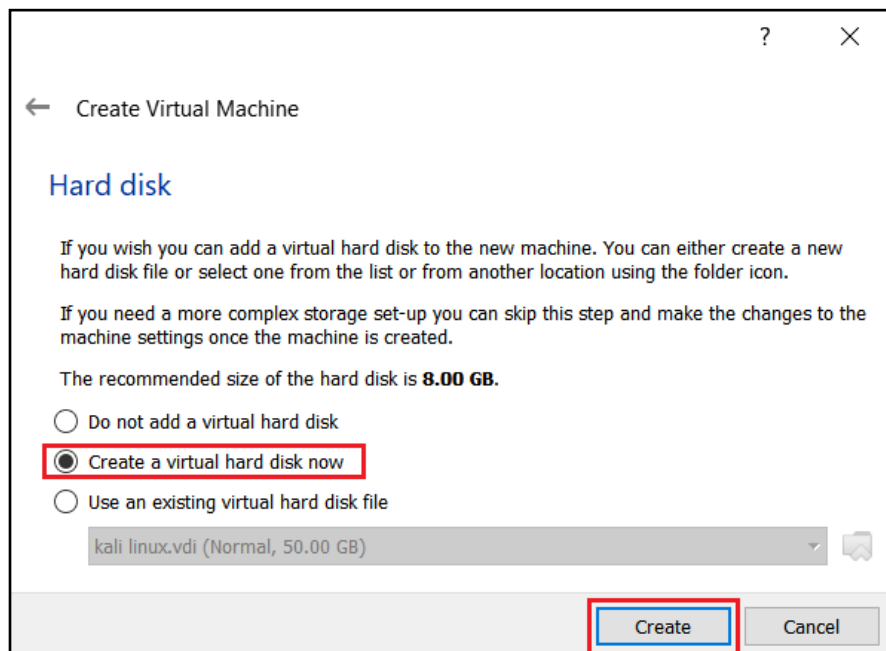
- 1 Open VirtualBox, click the **Machine** tab, click **New**, and name the VM *Kali Linux*.



- 2 Set the memory to **4096 MB** for proper functionality. You can use a larger setting (in accordance with the computer's available resources) for enhanced functionality.



- 3 On the next window, select **Create a virtual hard disk now** and click **Create**.



**4** Select **VHD (Virtual Hard Disk)** for the hard disk file type and click **Next**.

← Create Virtual Hard Disk

### Hard disk file type

Please choose the type of file that you would like to use for the new virtual hard disk. If you do not need to use it with other virtualization software you can leave this setting unchanged.

☐ VDI (VirtualBox Disk Image)

☒ VHD (Virtual Hard Disk)

☐ VMDK (Virtual Machine Disk)

Expert Mode **Next** Cancel

**5** Select **Dynamically allocated** and click **Next**.

← Create Virtual Hard Disk

### Storage on physical hard disk

Please choose whether the new virtual hard disk file should grow as it is used (dynamically allocated) or if it should be created at its maximum size (fixed size).

A **dynamically allocated** hard disk file will only use space on your physical hard disk as it fills up (up to a maximum **fixed size**), although it will not shrink again automatically when space on it is freed.

A **fixed size** hard disk file may take longer to create on some systems but is often faster to use.

☒ Dynamically allocated

☐ Fixed size

**Next** Cancel

- 6 Select the file location and set the storage size to **50GB**. If your computer does not have enough storage, you can set it to **20GB**.

← Create Virtual Hard Disk

**File location and size**

Please type the name of the new virtual hard disk file into the box below or click on the folder icon to select a different folder to create the file in.

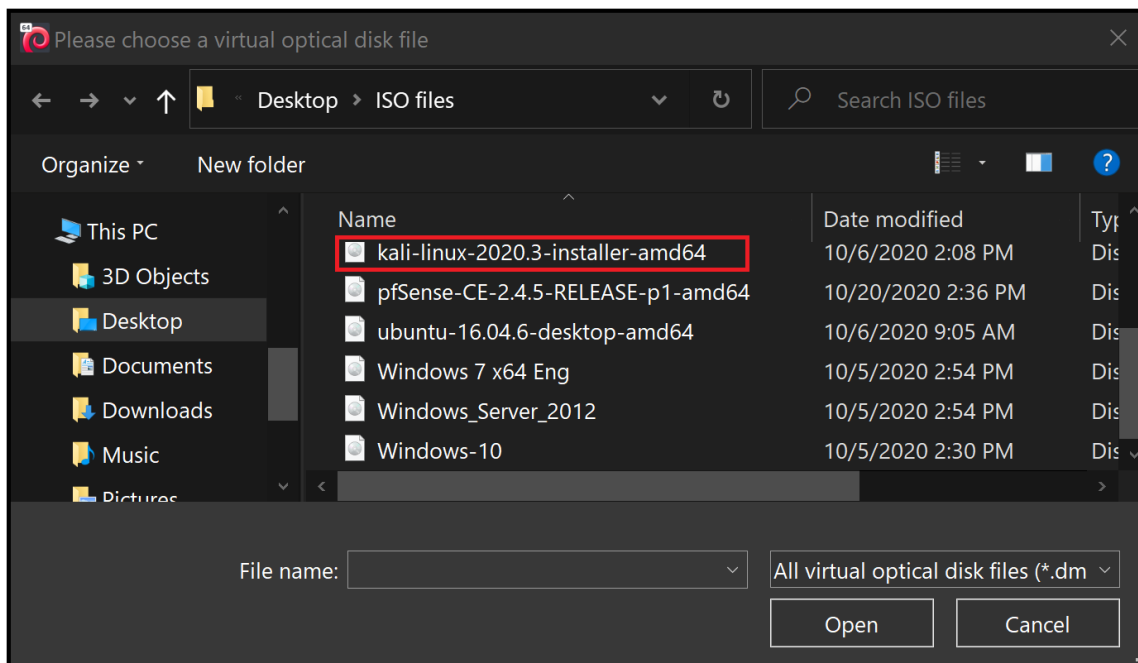
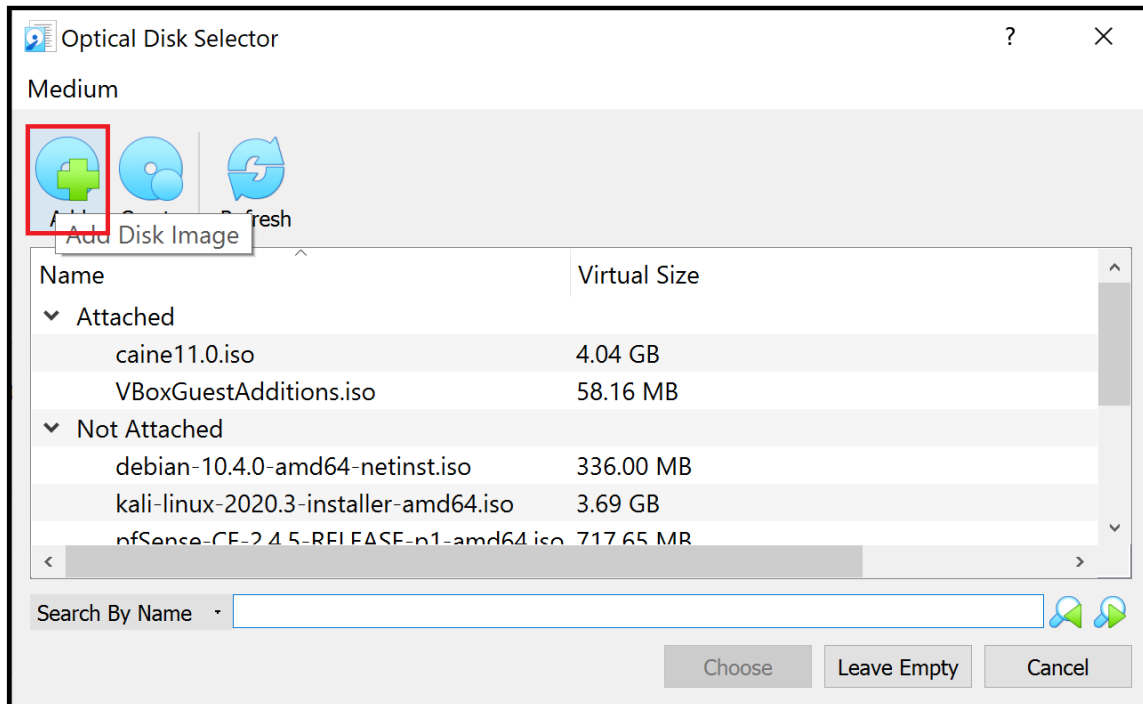
D:\VirtualBox\Kali-Linux\Kali-Linux.vhd

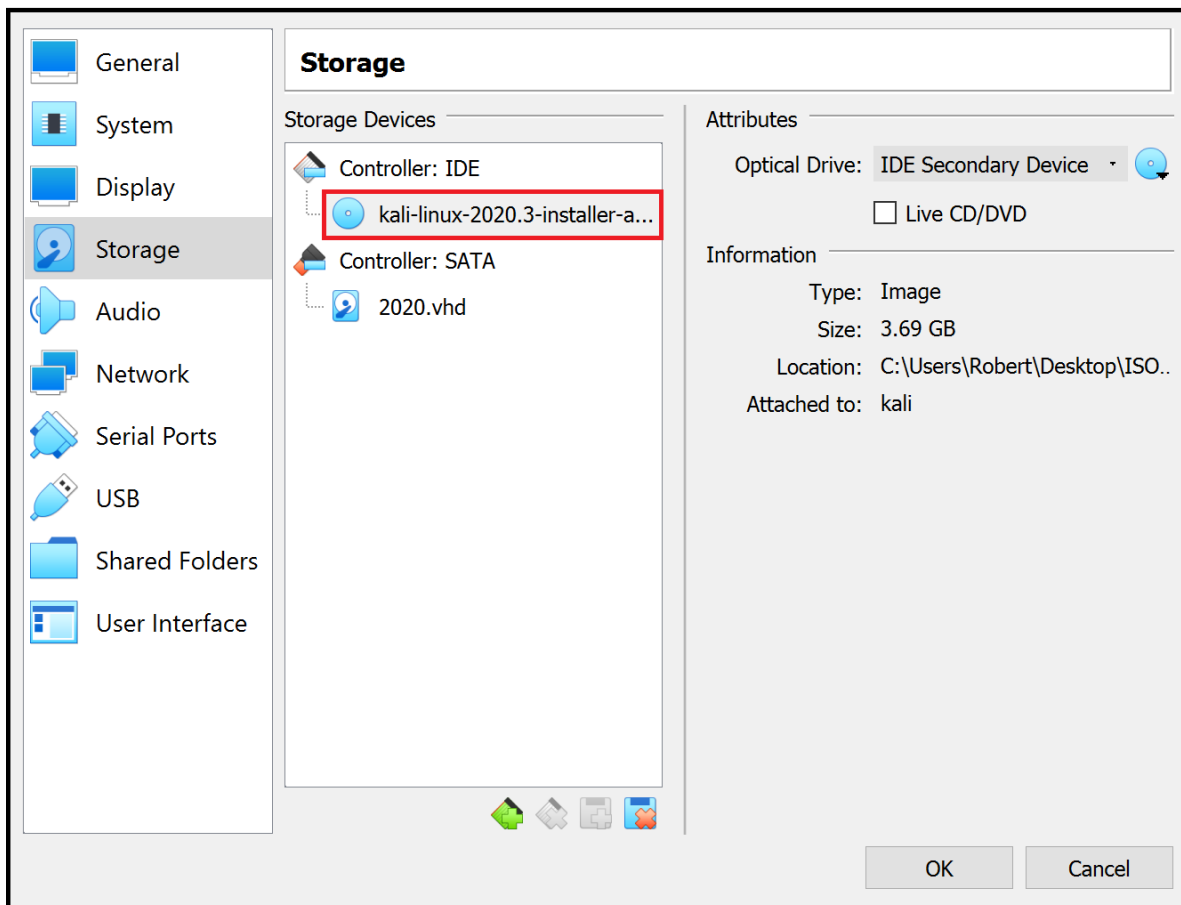
Select the size of the virtual hard disk in megabytes. This size is the limit on the amount of file data that a virtual machine will be able to store on the hard disk.

4.00 MB 2.00 TB 50.00 GB

Create Cancel

- 7 Right-click the Kali VM, go to **Settings > Storage**, and under Controller: IDE, insert the ***Kali-linux-2020.3-installer-amd64.iso*** in the drive.



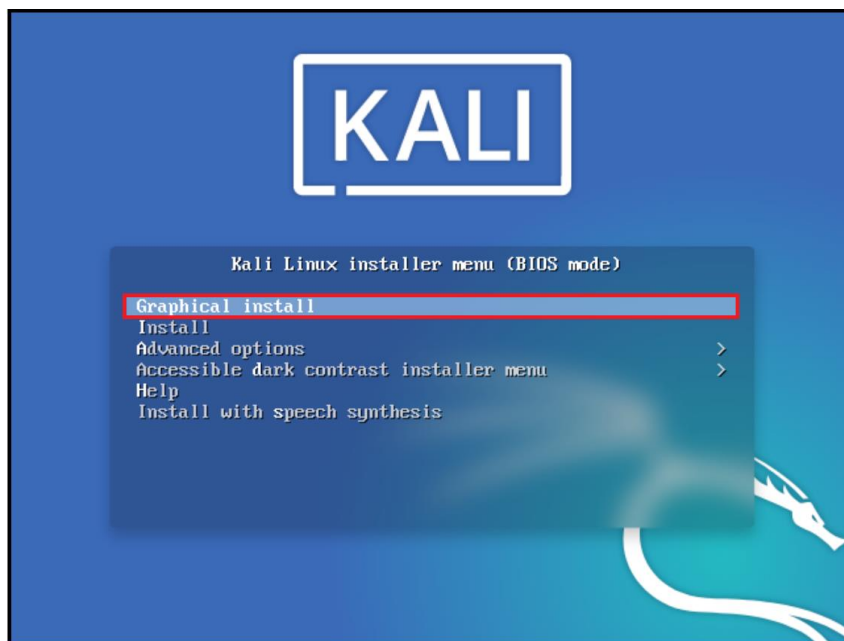




## Lab Task 2: Install Kali Linux on the VM

Now that the virtual machine is configured, proceed with the Kali Linux installation.

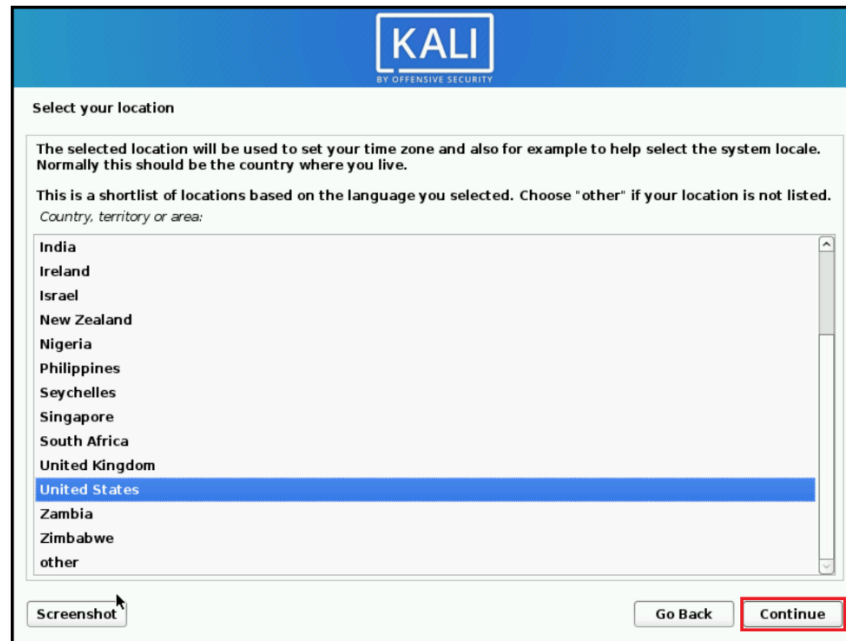
- 1 Start the VM. If prompted to enter a disk, click **Cancel**. Select **Graphical install** for easier installation with a graphical interface and press **Enter**.



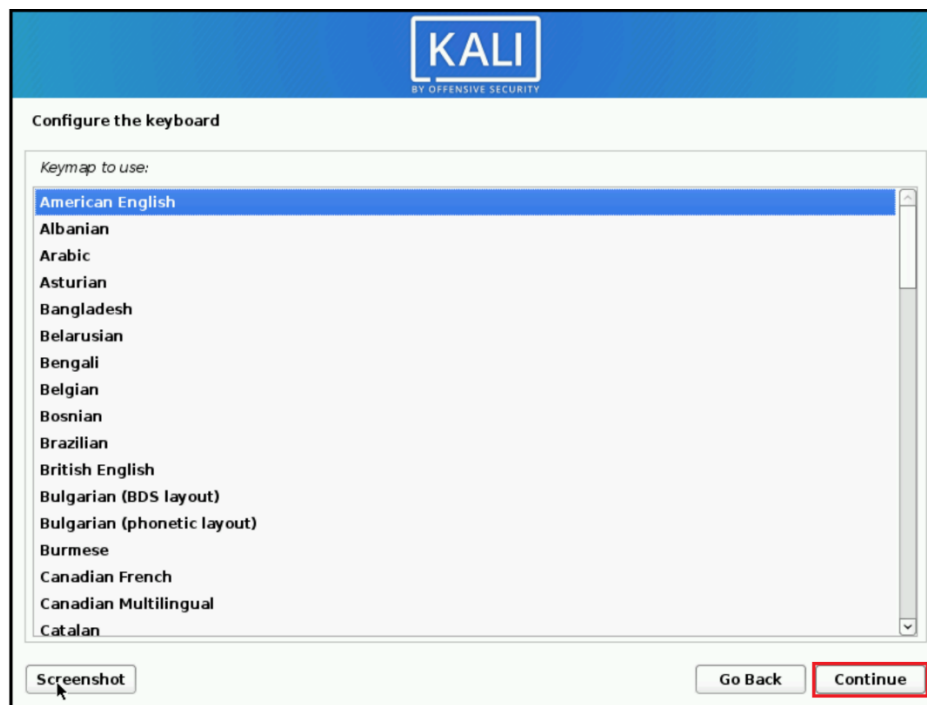
- 2 Choose the English language for the system and click **Continue**.



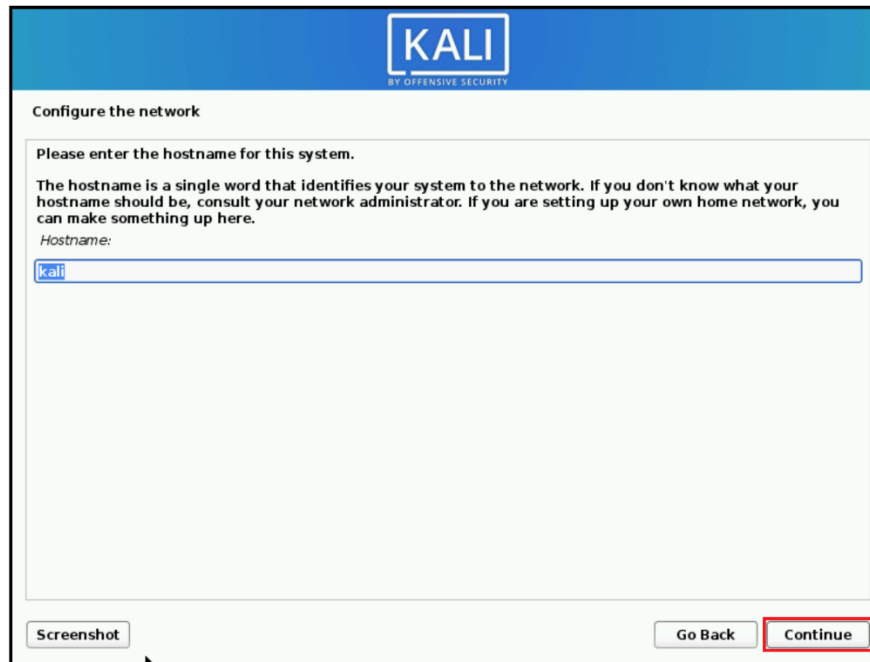
- 3 Select the United States as your location so the system can set the correct time and click **Continue**.



- 4 Select **American English** for the keyboard and click **Continue**.

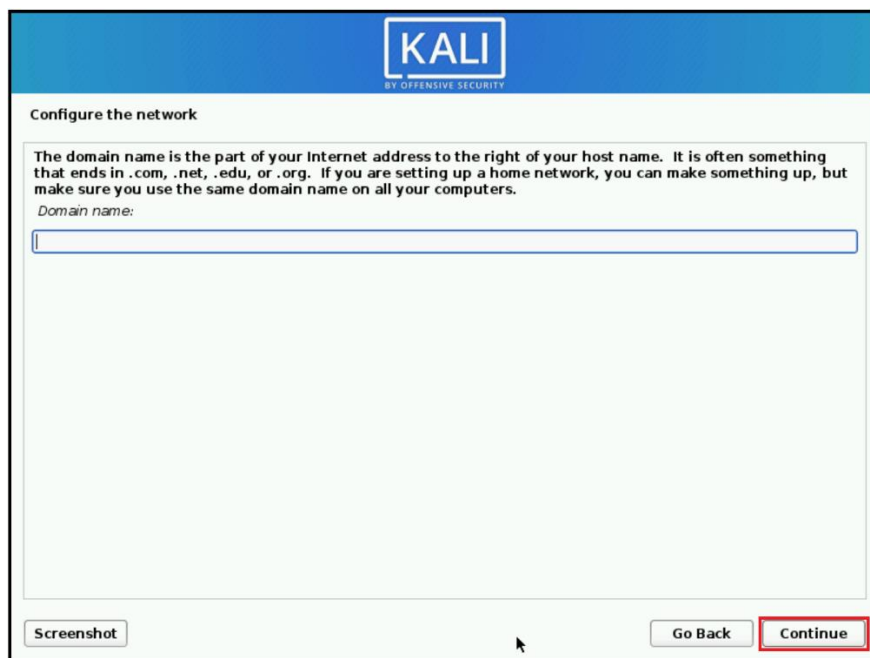


- 5 Set the hostname (network identification name) to *Kali* and click **Continue**.



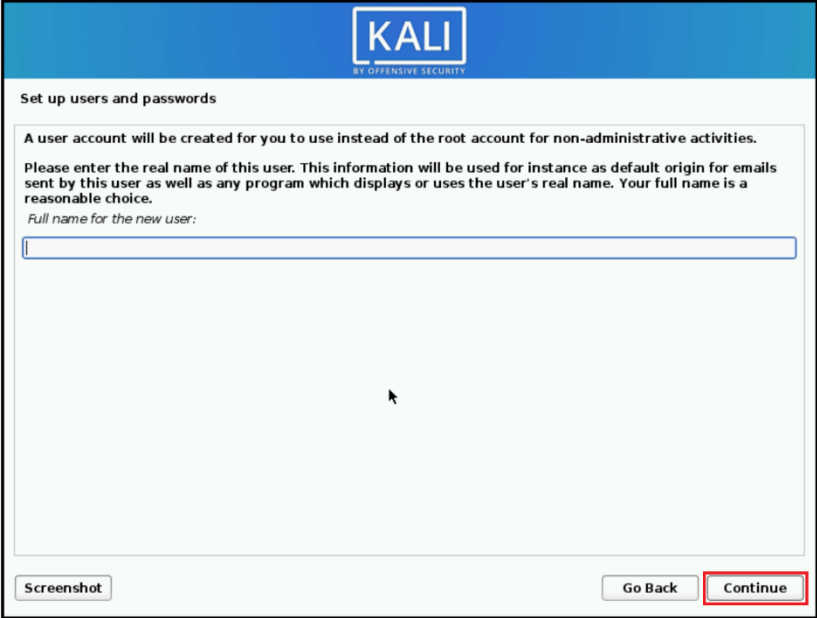
The screenshot shows the 'Configure the network' window in Kali Linux. The window has a blue header with the 'KALI' logo and 'BY OFFENSIVE SECURITY' text. Below the header, the title 'Configure the network' is displayed. The main content area contains the following text: 'Please enter the hostname for this system. The hostname is a single word that identifies your system to the network. If you don't know what your hostname should be, consult your network administrator. If you are setting up your own home network, you can make something up here.' Below this text, the label 'Hostname:' is followed by a text input field containing the word 'kali'. At the bottom of the window, there are three buttons: 'Screenshot', 'Go Back', and 'Continue'. The 'Continue' button is highlighted with a red border.

- 6 Leave the domain name field empty, since you are not part of an enterprise network, and click **Continue**.



The screenshot shows the 'Configure the network' window in Kali Linux, continuing from the previous step. The window has the same blue header with the 'KALI' logo and 'BY OFFENSIVE SECURITY' text. Below the header, the title 'Configure the network' is displayed. The main content area contains the following text: 'The domain name is the part of your Internet address to the right of your host name. It is often something that ends in .com, .net, .edu, or .org. If you are setting up a home network, you can make something up, but make sure you use the same domain name on all your computers.' Below this text, the label 'Domain name:' is followed by an empty text input field. At the bottom of the window, there are three buttons: 'Screenshot', 'Go Back', and 'Continue'. The 'Continue' button is highlighted with a red border.

## 7 Enter **Johnd** as the name of the user.



The screenshot shows the Kali Linux user setup interface. At the top is the Kali logo with the text "BY OFFENSIVE SECURITY". Below the logo, the heading "Set up users and passwords" is displayed. A paragraph explains that a user account will be created for non-administrative activities and that the real name of the user will be used for email defaults and program displays. A text input field is labeled "Full name for the new user:". At the bottom of the form, there are three buttons: "Screenshot", "Go Back", and "Continue". The "Continue" button is highlighted with a red border.

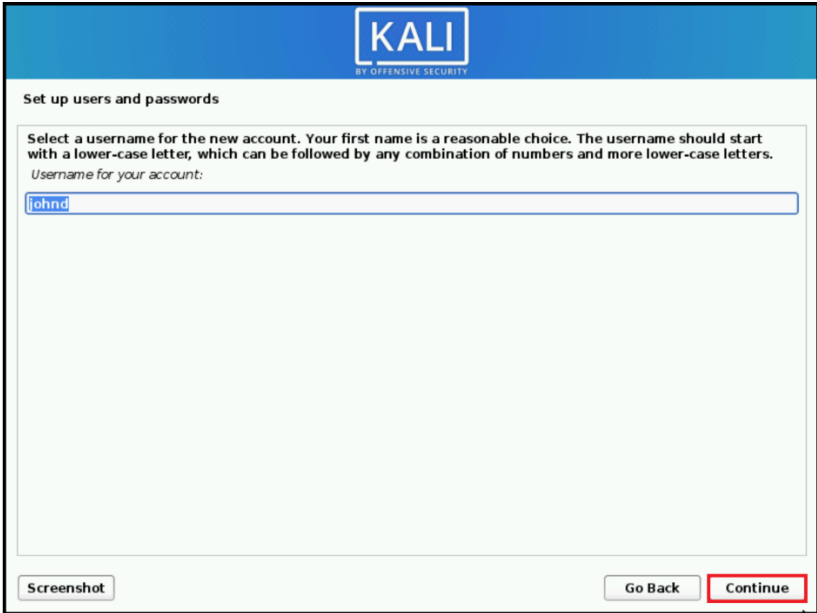
KALI  
BY OFFENSIVE SECURITY

Set up users and passwords

A user account will be created for you to use instead of the root account for non-administrative activities. Please enter the real name of this user. This information will be used for instance as default origin for emails sent by this user as well as any program which displays or uses the user's real name. Your full name is a reasonable choice.

Full name for the new user:

Screenshot Go Back Continue



The screenshot shows the same Kali Linux user setup interface, but now the username "Johnd" has been entered into the text input field. The "Continue" button remains highlighted with a red border.

KALI  
BY OFFENSIVE SECURITY

Set up users and passwords

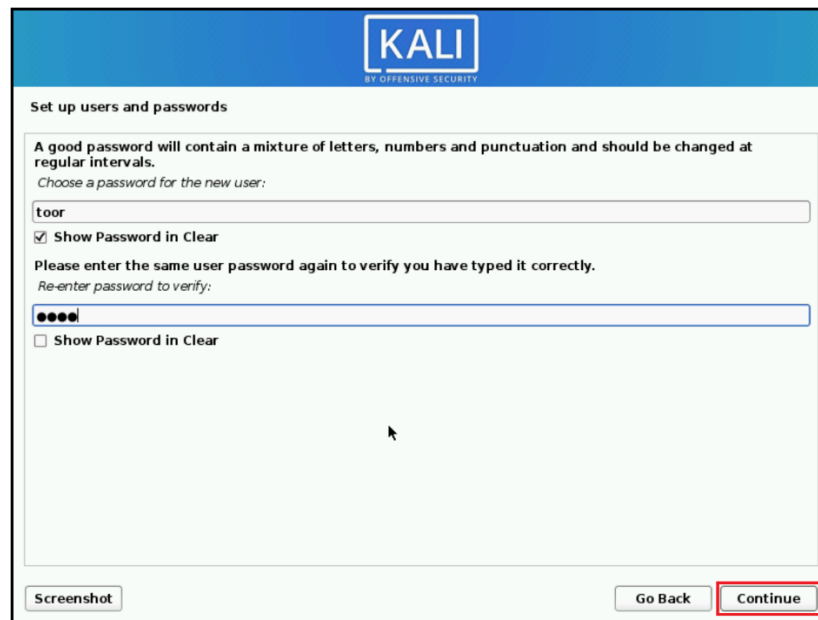
Select a username for the new account. Your first name is a reasonable choice. The username should start with a lower-case letter, which can be followed by any combination of numbers and more lower-case letters.

Username for your account:

Johnd

Screenshot Go Back Continue

- 8 Set the password to **toor** for this lab and click **Continue**. The password will be used to log in later.



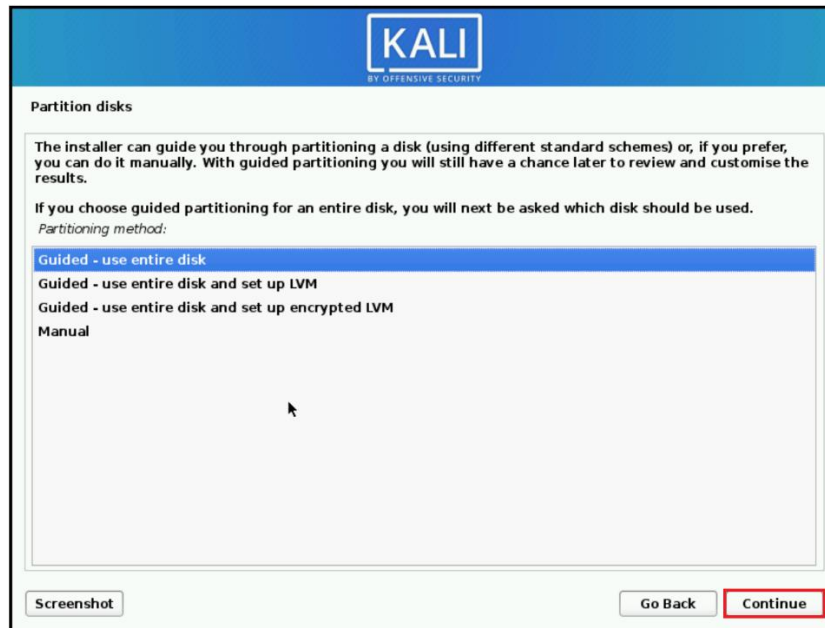
The screenshot shows the 'Set up users and passwords' screen in the Kali Linux installer. At the top is the Kali logo with the tagline 'BY OFFENSIVE SECURITY'. Below the title, there is a text box with instructions: 'A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals. Choose a password for the new user:'. A text input field contains the password 'toor'. Below this field is a checkbox labeled 'Show Password in Clear' which is checked. Further down, another instruction says 'Please enter the same user password again to verify you have typed it correctly. Re-enter password to verify:'. A second text input field contains masked characters (dots). Below this field is an unchecked checkbox labeled 'Show Password in Clear'. At the bottom of the screen, there are three buttons: 'Screenshot', 'Go Back', and 'Continue'. The 'Continue' button is highlighted with a red rectangular border.

- 9 Set your time zone and click **Continue**.

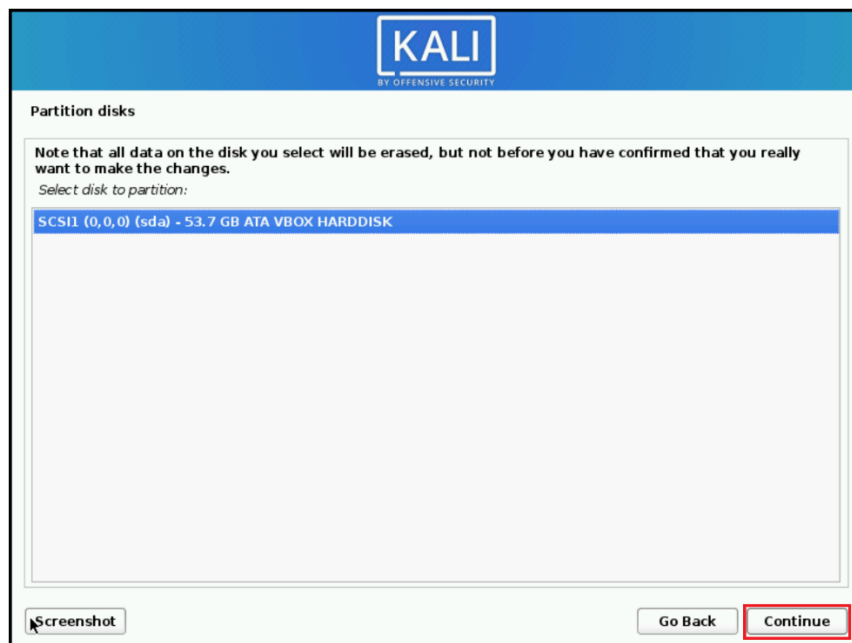


The screenshot shows the 'Configure the clock' screen in the Kali Linux installer. At the top is the Kali logo with the tagline 'BY OFFENSIVE SECURITY'. Below the title, there is a text box with instructions: 'If the desired time zone is not listed, then please go back to the step "Choose language" and select a country that uses the desired time zone (the country where you live or are located). Select your time zone:'. Below this text is a list of time zones: Eastern, Central, Mountain, Pacific, Alaska, Hawaii, Arizona, East Indiana, and Samoa. The 'Eastern' time zone is currently selected and highlighted with a blue background. At the bottom of the screen, there are three buttons: 'Screenshot', 'Go Back', and 'Continue'. The 'Continue' button is highlighted with a red rectangular border.

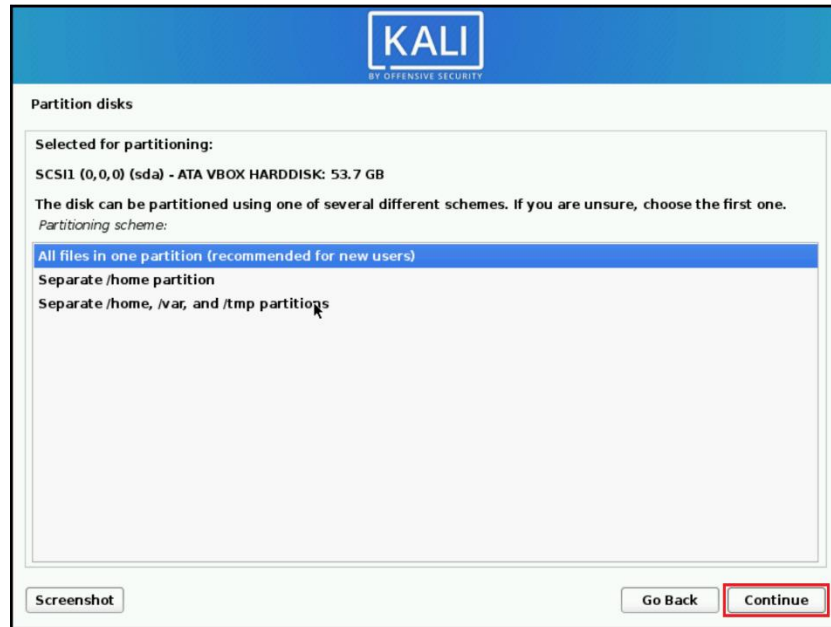
- 10** Select **Guided – use entire disk** for easy installation and click **Continue**. The system will detect the settings and set them automatically.



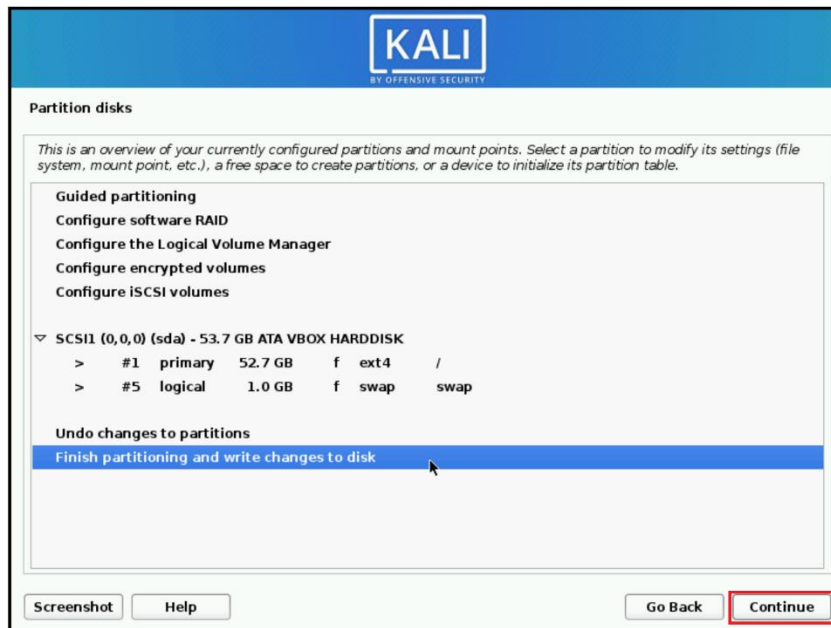
- 11** Select the disk to remove everything on the virtual disk (it is empty) and install Kali, then click **Continue**.



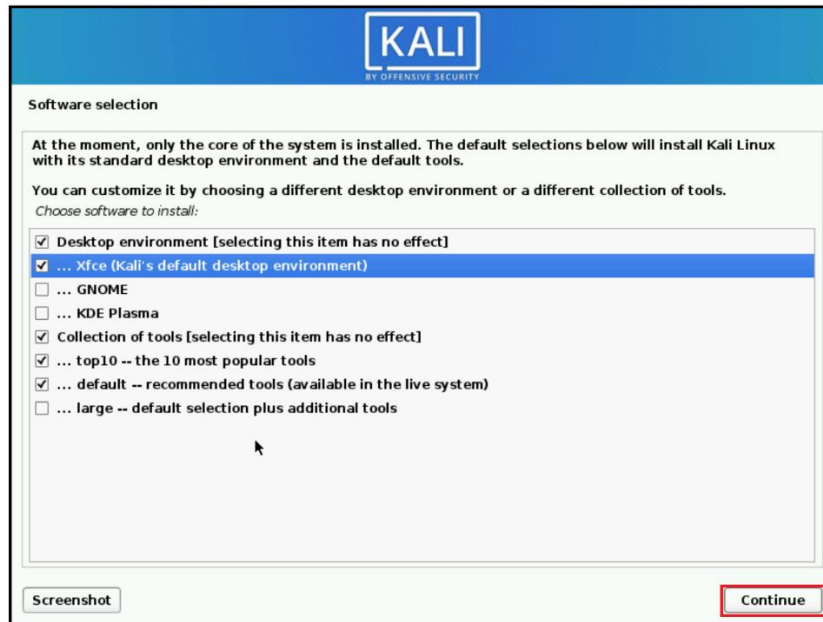
**12** Select *All files in one partition* and click **Continue**.



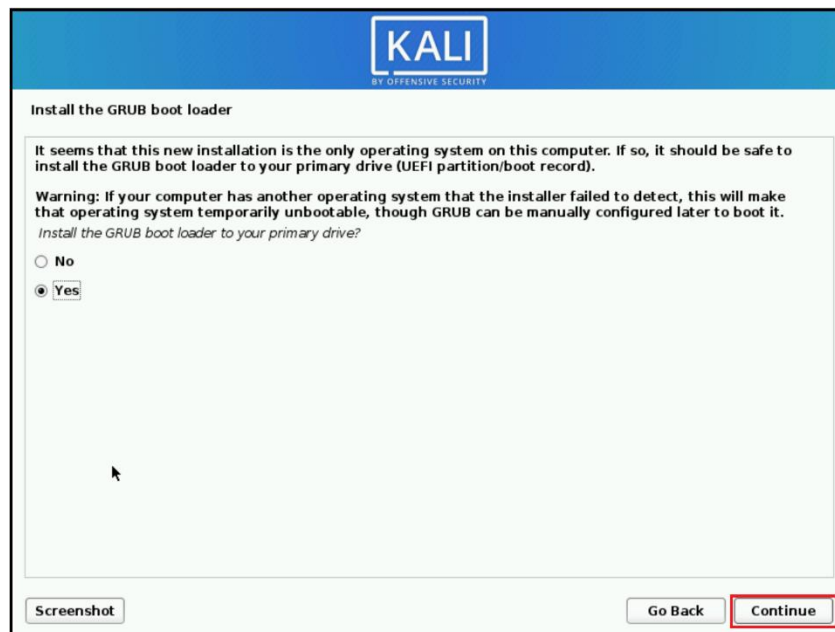
**13** Select *Finish partitioning and write changes to disk* and click **Continue**.



- 14 Select **Yes** to confirm the changes and click **Continue**.
- 15 Select **Continue** to install the graphical user interface and default tools.

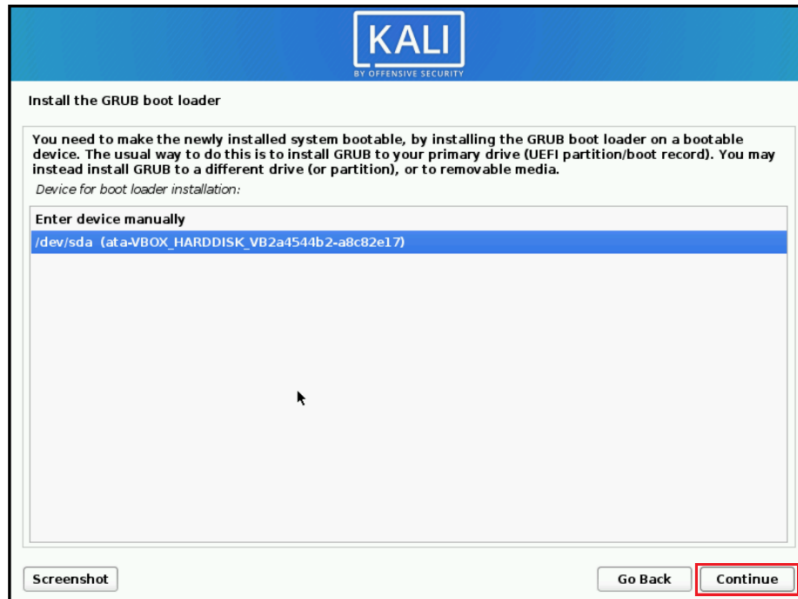


- 16 Select **Yes** and click **Continue**. GRUB is an essential part of the OS booting process.

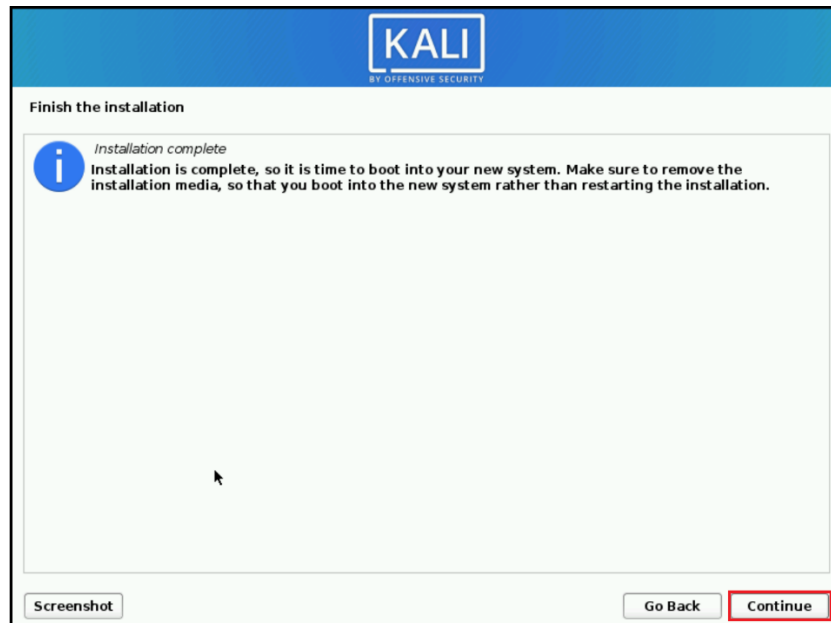




- 17** Select **`/dev/sda`**, which is the default location (there is no need to change it) and click **Continue**.



- 18** Click **Continue** to complete the installation.



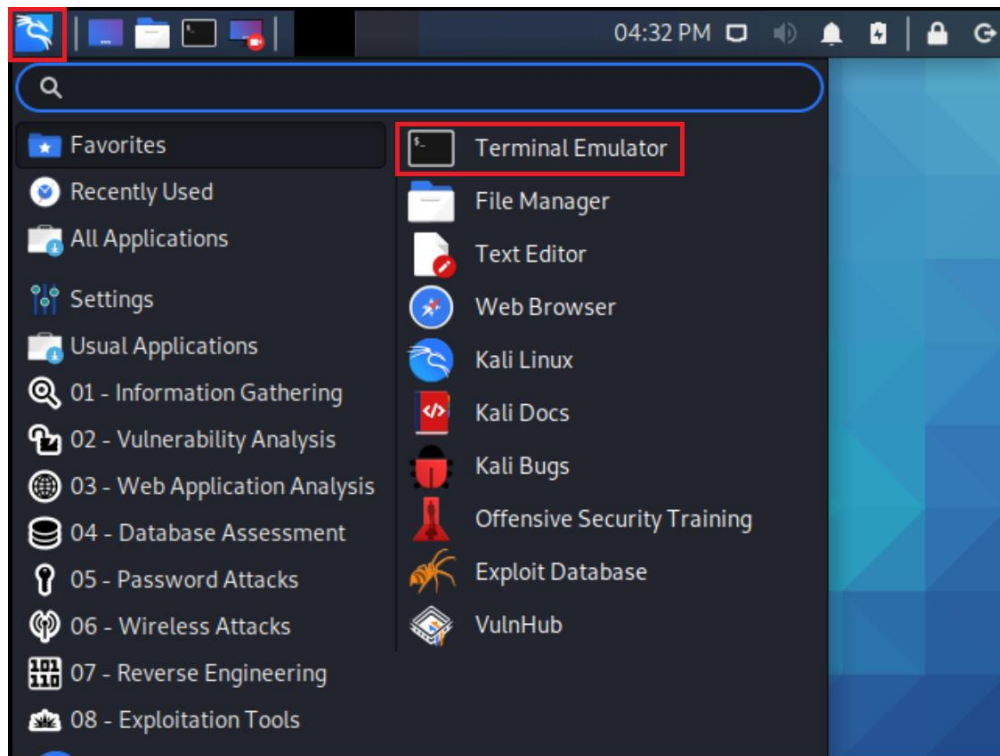
## Lab Task 3: Post Installation Update

In this task, you will update the information required for future Kali Linux OS updates.

- 1 Log in with the **johnd** user and **toor** password.



- 2 Open the application menu by clicking the dotted icon in the access bar on the left.

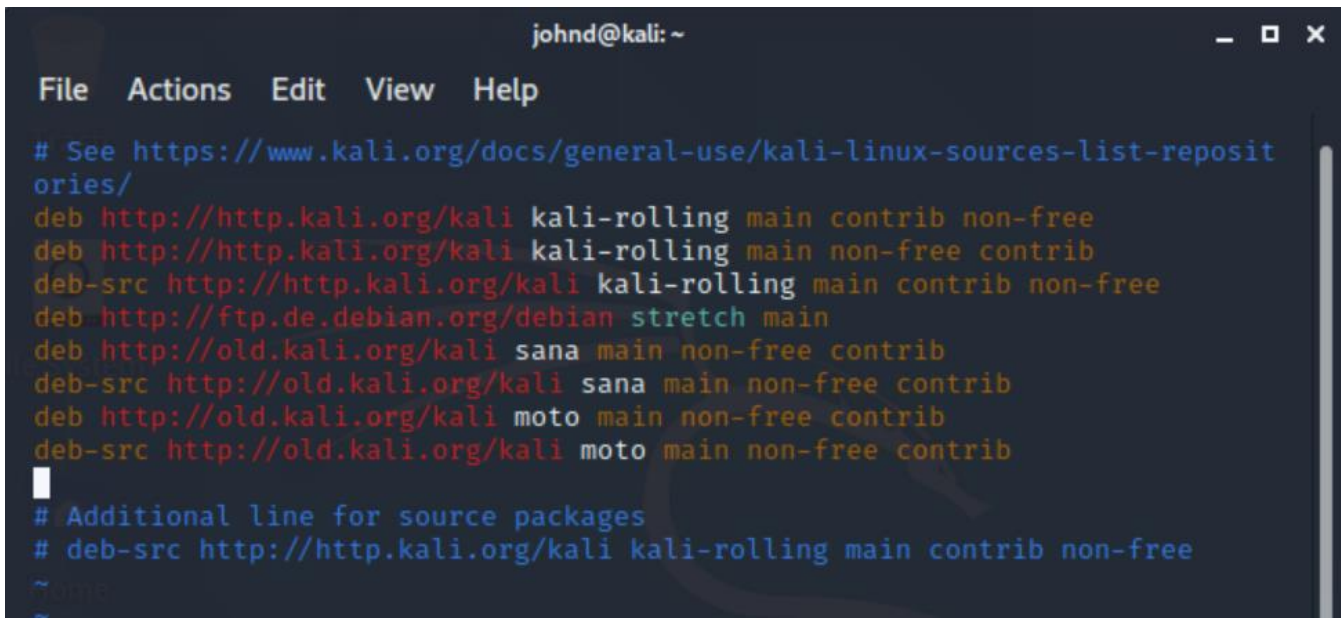


- 3 Type **sudo vi /etc/apt/sources.list** in the terminal window.

```
johnd@kali: ~  
File Actions Edit View Help  
johnd@kali:~$ sudo vi /etc/apt/sources.list
```

- 4 Within the **vi** editor window, use the arrow keys to navigate to the appropriate line, then press **I** and begin entering the following information, which is also shown in the screenshot below:

**deb <http://http.kali.org/kali> kali-rolling main non-free contrib**  
**deb-src <http://http.kali.org/kali> kali-rolling main contrib non-free**  
**deb <http://ftp.de.debian.org/debian> stretch main**  
**deb <http://old.kali.org/kali> sana main non-free contrib**  
**deb-src <http://old.kali.org/kali> sana main non-free contrib**  
**deb <http://old.kali.org/kali> moto main non-free contrib**  
**deb-src <http://old.kali.org/kali> moto main non-free contrib**



```
johnd@kali: ~
File  Actions  Edit  View  Help
# See https://www.kali.org/docs/general-use/kali-linux-sources-list-reposit
ories/
deb http://http.kali.org/kali kali-rolling main contrib non-free
deb http://http.kali.org/kali kali-rolling main non-free contrib
deb-src http://http.kali.org/kali kali-rolling main contrib non-free
deb http://ftp.de.debian.org/debian stretch main
deb http://old.kali.org/kali sana main non-free contrib
deb-src http://old.kali.org/kali sana main non-free contrib
deb http://old.kali.org/kali moto main non-free contrib
deb-src http://old.kali.org/kali moto main non-free contrib
#
# Additional line for source packages
# deb-src http://http.kali.org/kali kali-rolling main contrib non-free
```

- 5 After you have entered the text, press **Esc** to exit **Insert mode**. Then type **:wq!** in the vi editor to save the file.

[illegible]

## Lab Task 4: Installing a Guest Addition

In this task, you will install a guest addition to your Kali machine.

- 1 Type **sudo apt-get update** and press **Enter** to update the repositories.

```
johnd@kali:~$ sudo apt-get update
Ign:1 http://ftp.de.debian.org/debian stretch InRelease
Get:3 http://ftp.de.debian.org/debian stretch Release [118 kB]
Get:4 http://old.kali.org/kali sana InRelease [20.3 kB]
Get:5 http://old.kali.org/kali moto InRelease [20.3 kB]
Get:6 http://old.kali.org/kali sana/non-free Sources [122 kB]
Get:7 http://old.kali.org/kali sana/main Sources [9,091 kB]
Get:8 http://ftp.de.debian.org/debian stretch Release.gpg [2,410 B]
Get:9 http://ftp.de.debian.org/debian stretch/main amd64 Packages [7,080 kB]
]
Get:10 http://old.kali.org/kali sana/contrib Sources [58.3 kB]
Get:11 http://old.kali.org/kali sana/main amd64 Packages [12.8 MB]
Get:12 http://ftp.de.debian.org/debian stretch/main Translation-en [5,377 k
B]
Get:13 http://old.kali.org/kali sana/non-free amd64 Packages [163 kB]
Get:14 http://old.kali.org/kali sana/contrib amd64 Packages [87.7 kB]
Get:15 http://old.kali.org/kali moto/non-free Sources [119 kB]
Get:16 http://old.kali.org/kali moto/contrib Sources [56.8 kB]
Get:17 http://old.kali.org/kali moto/main Sources [7,555 kB]
Get:18 http://old.kali.org/kali moto/main amd64 Packages [10.9 MB]
Get:19 http://old.kali.org/kali moto/non-free amd64 Packages [169 kB]
Get:20 http://old.kali.org/kali moto/contrib amd64 Packages [78.6 kB]
Get:2 http://kali.download/kali kali-rolling InRelease [30.5 kB]
Get:21 http://kali.download/kali kali-rolling/contrib Sources [64.4 kB]
Get:22 http://kali.download/kali kali-rolling/main Sources [14.0 MB]
Get:23 http://kali.download/kali kali-rolling/non-free Sources [127 kB]
Get:24 http://kali.download/kali kali-rolling/main amd64 Packages [17.7 MB]
```



- 2 Type **sudo apt install virtualbox-guest-x11** and press **Enter** to download Guest Additions. Then press **y** to continue.

```
johnd@kali:~$ sudo apt install virtualbox-guest-x11
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  virtualbox-guest-utils
The following packages will be upgraded:
  virtualbox-guest-utils virtualbox-guest-x11
2 upgraded, 0 newly installed, 0 to remove and 1509 not upgraded.
Need to get 1,509 kB of archives.
After this operation, 211 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://kali.download/kali kali-rolling/contrib amd64 virtualbox-guest-x11 amd64 6.1.20-dfsg-1 [591 kB]
Get:2 http://kali.download/kali kali-rolling/contrib amd64 virtualbox-guest-utils amd64 6.1.20-dfsg-1 [918 kB]
Fetched 1,509 kB in 11s (139 kB/s)
(Reading database ... 276101 files and directories currently installed.)
Preparing to unpack .../virtualbox-guest-x11_6.1.20-dfsg-1_amd64.deb ...
Unpacking virtualbox-guest-x11 (6.1.20-dfsg-1) over (6.1.12-dfsg-3) ...
Preparing to unpack .../virtualbox-guest-utils_6.1.20-dfsg-1_amd64.deb ...
Unpacking virtualbox-guest-utils (6.1.20-dfsg-1) over (6.1.12-dfsg-3) ...
Setting up virtualbox-guest-utils (6.1.20-dfsg-1) ...
Setting up virtualbox-guest-x11 (6.1.20-dfsg-1) ...
Processing triggers for systemd (245.6-2) ...
Processing triggers for man-db (2.9.3-2) ...
Processing triggers for kali-menu (2020.3.2) ...
```

- 3 Type **sudo init 6** and press **Enter** to reboot the machine.

Notes: Guest Additions should now be applied. If the resolution does not change, press **Ctrl+F** to enter full-screen mode. Press **Ctrl+F** again to return to the previous mode. The resolution should now be changed.

```
johnd@kali:~$ sudo init 6
```

## Lab Task 5: Configuring VirtualBox Guest Additions Features

Several additional steps are required for VirtualBox Guest Additions to function properly. These steps are described next.

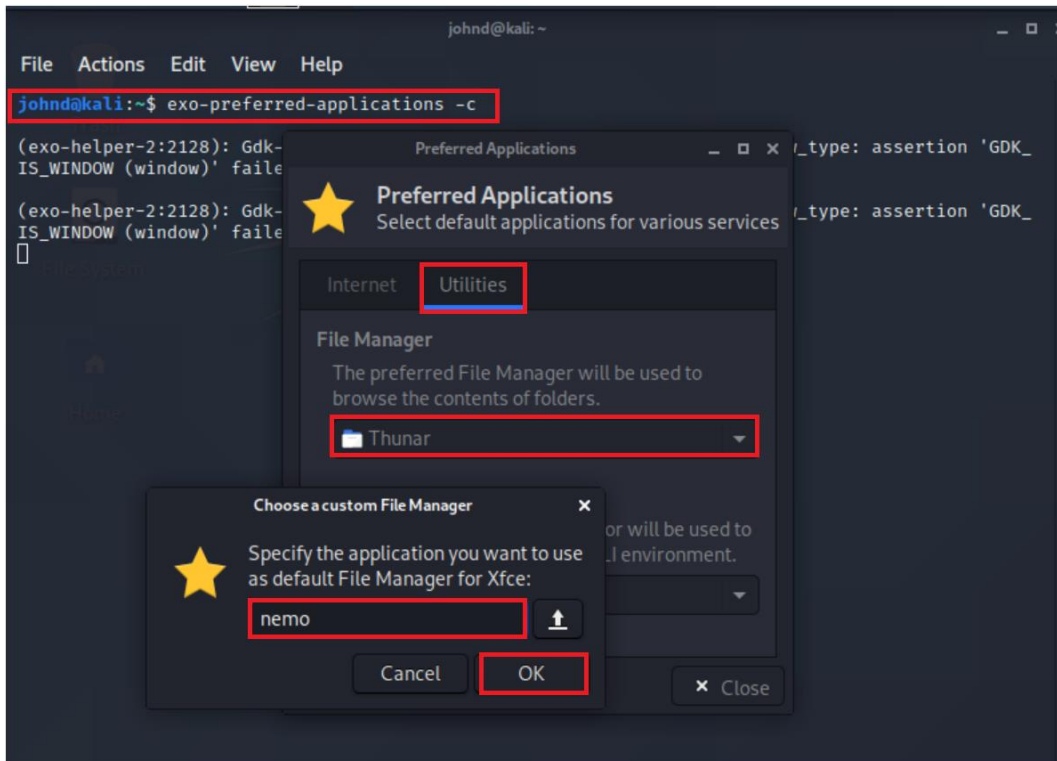
- 1 Install the **nemo** file manager by issuing the following command from a terminal window: **sudo apt-get install nemo**

```
johnd@kali:~$ sudo apt-get install nemo
[sudo] password for johnd:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  cinnamon-desktop-data cinnamon-l10n docbook-xml file-roller
  fonts-dejavu gir1.2-harfbuzz-0.0 gir1.2-pango-1.0 gist hddtemp hwdata
  inxi libcinnamon-desktop4 libexempi8 libgail-3-0 libgdk-pixbuf-2.0-0
  libgdk-pixbuf-xlib-2.0-0 libgdk-pixbuf2.0-0 libgdk-pixbuf2.0-common
  libglew2.1 libgnomekbd-common libgnomekbd8 libgtk-3-0 libgtk-3-common
  libharfbuzz0b libjson-glib-1.0-0 libjson-glib-1.0-common
  libnautilus-extension1a libnemo-extension1 libpango-1.0-0
  libpangocairo-1.0-0 libpangoft2-1.0-0 libpangoxft-1.0-0 libselinux1
  libxapp1 libyelp0 lm-sensors mesa-utils nemo-data nemo-fileroller
  sgml-base sgml-data tree xapps-common xml-core yelp yelp-xsl
Suggested packages:
  docbook docbook-dsssl docbook-xsl docbook-defguide lha lzip lzop
  rpm2cpio rzip sharutils unace unalzip zoo libcpml-json-xs-perl
  | libjson-xs-perl libxml-dumper-perl glew-utils fancontrol eog totem
  mp3-decoder sgml-base-doc perlsgml w3-recs opensp debhelper
The following NEW packages will be installed:
  cinnamon-desktop-data cinnamon-l10n docbook-xml file-roller
  fonts-dejavu gir1.2-harfbuzz-0.0 gist hddtemp hwdata inxi
  libcinnamon-desktop4 libexempi8 libgail-3-0 libgdk-pixbuf-2.0-0
  libgdk-pixbuf-xlib-2.0-0 libglew2.1 libgnomekbd-common libgnomekbd8
  libnautilus-extension1a libnemo-extension1 libxapp1 libyelp0 lm-sensors
  mesa-utils nemo nemo-data nemo-fileroller sgml-base sgml-data tree
  xapps-common xml-core yelp yelp-xsl
The following packages will be upgraded:
  gir1.2-pango-1.0 libgdk-pixbuf2.0-0 libgdk-pixbuf-xlib-2.0-0 libgtk-3-0
```

```
Do you want to continue? [Y/n] y
Get:1 http://kali.download/kali kali-rolling/main amd64 sgml-base all 1.30 [15.1 kB]
Get:2 http://kali.download/kali kali-rolling/main amd64 libselinux1 amd64 3.1-3 [88.1 kB]
Get:3 http://kali.download/kali kali-rolling/main amd64 cinnamon-desktop-data all 4.8.1-2 [154
kB]
Get:4 http://kali.download/kali kali-rolling/main amd64 cinnamon-l10n all 4.8.3-1 [3,159 kB]
Get:5 http://kali.download/kali kali-rolling/main amd64 xml-core all 0.18+nmu1 [23.8 kB]
Get:6 http://kali.download/kali kali-rolling/main amd64 sgml-data all 2.0.11+nmu1 [179 kB]
Get:7 http://kali.download/kali kali-rolling/main amd64 docbook-xml all 4.5-9 [84.4 kB]
Get:8 http://kali.download/kali kali-rolling/main amd64 libgdk-pixbuf2.0-0 amd64 2.40.2-2 [14.1
kB]
Get:9 http://kali.download/kali kali-rolling/main amd64 libgdk-pixbuf-xlib-2.0-0 amd64 2.40.2-2
[47.9 kB]
```



- 2 Issue the following command, ***exo-preferred-applications -c***, then click the **Utilities** tab and select ***nemo*** from the drop-down menu. Click **OK** then **Close**.

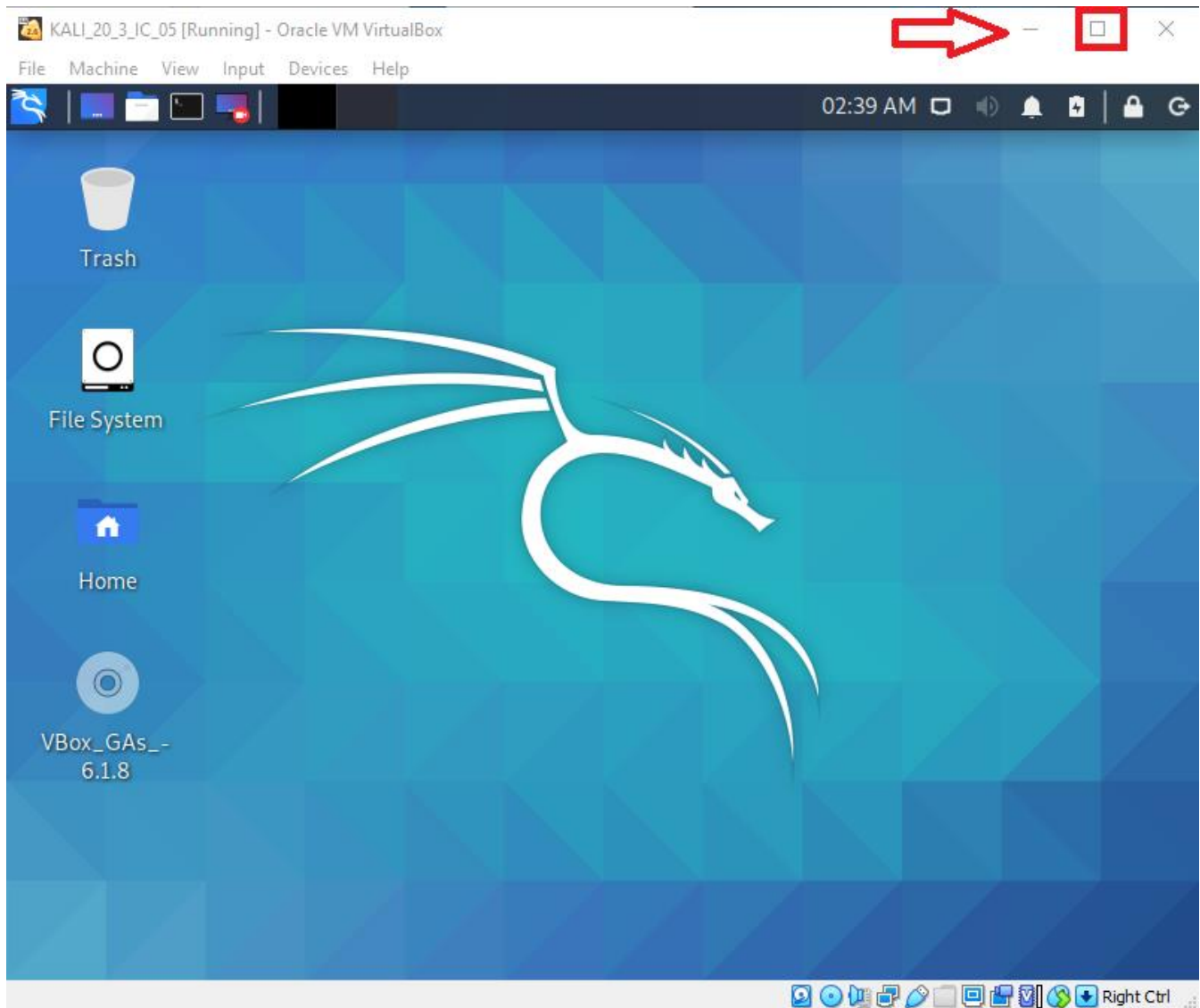


- 3 The system is now ready to work with Guest Addition Features.

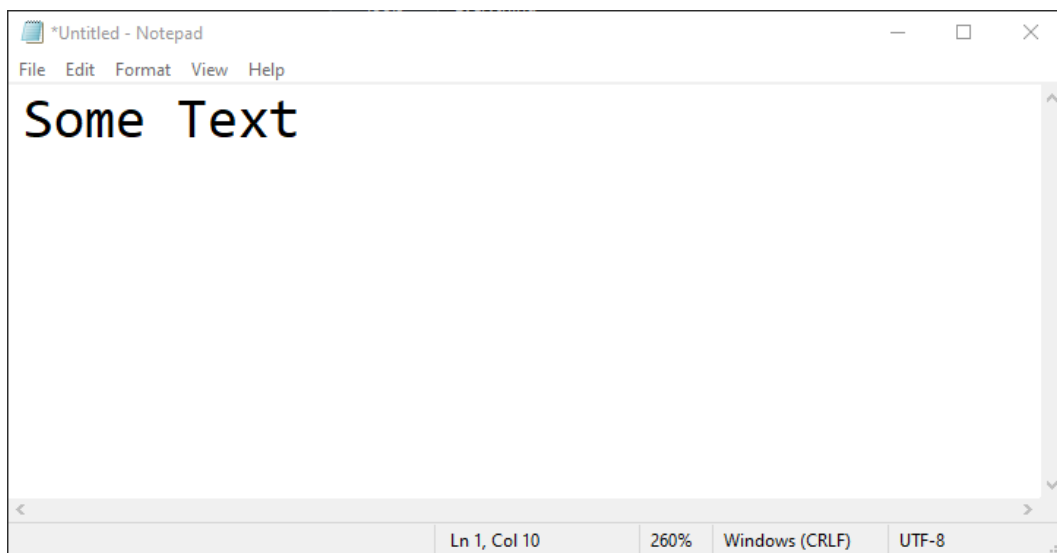
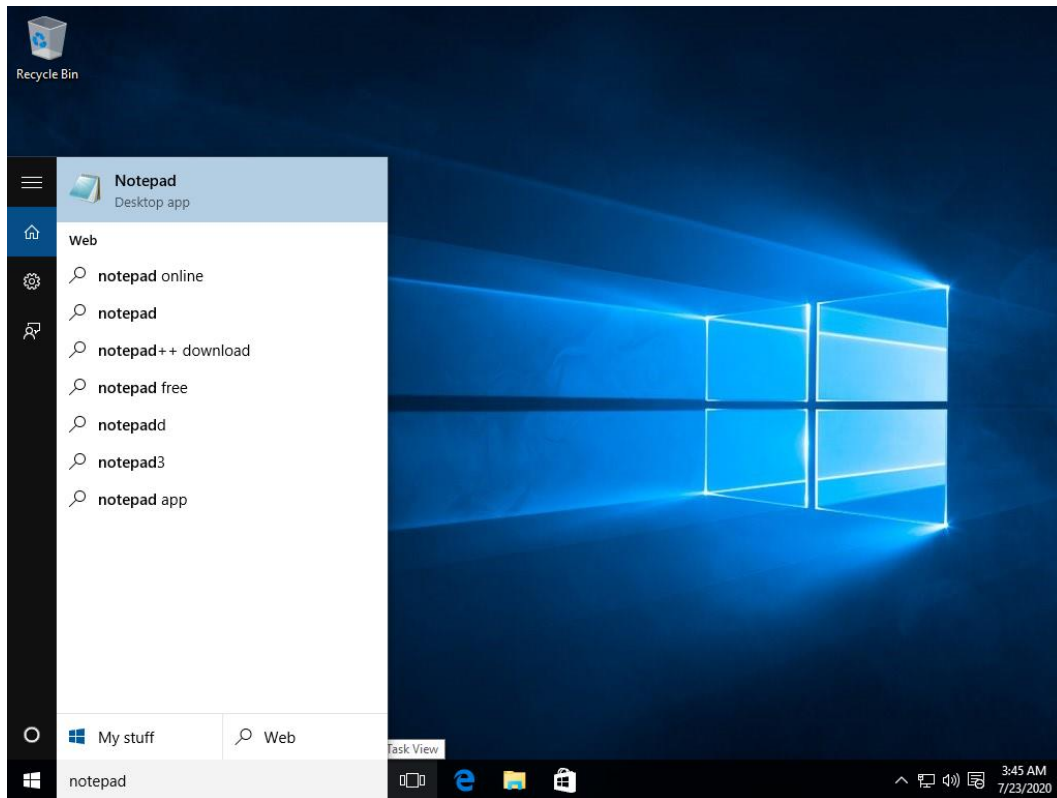
## Lab Task 6: Working with Guest Additions Features

In this procedure, you will learn how to use some of the Guest Additions features.

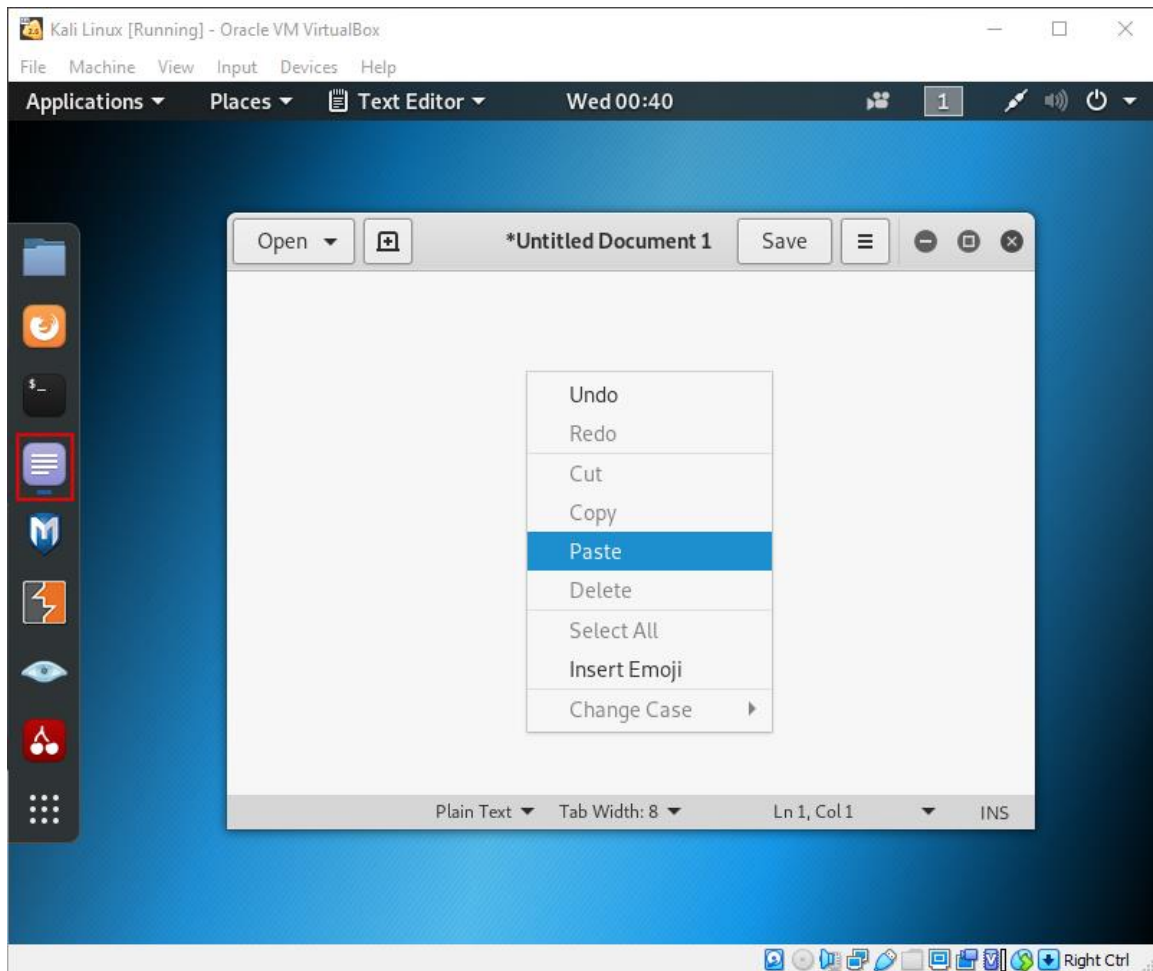
- 1 Click the maximize icon in the VirtualBox window to expand the window to fit the entire screen.



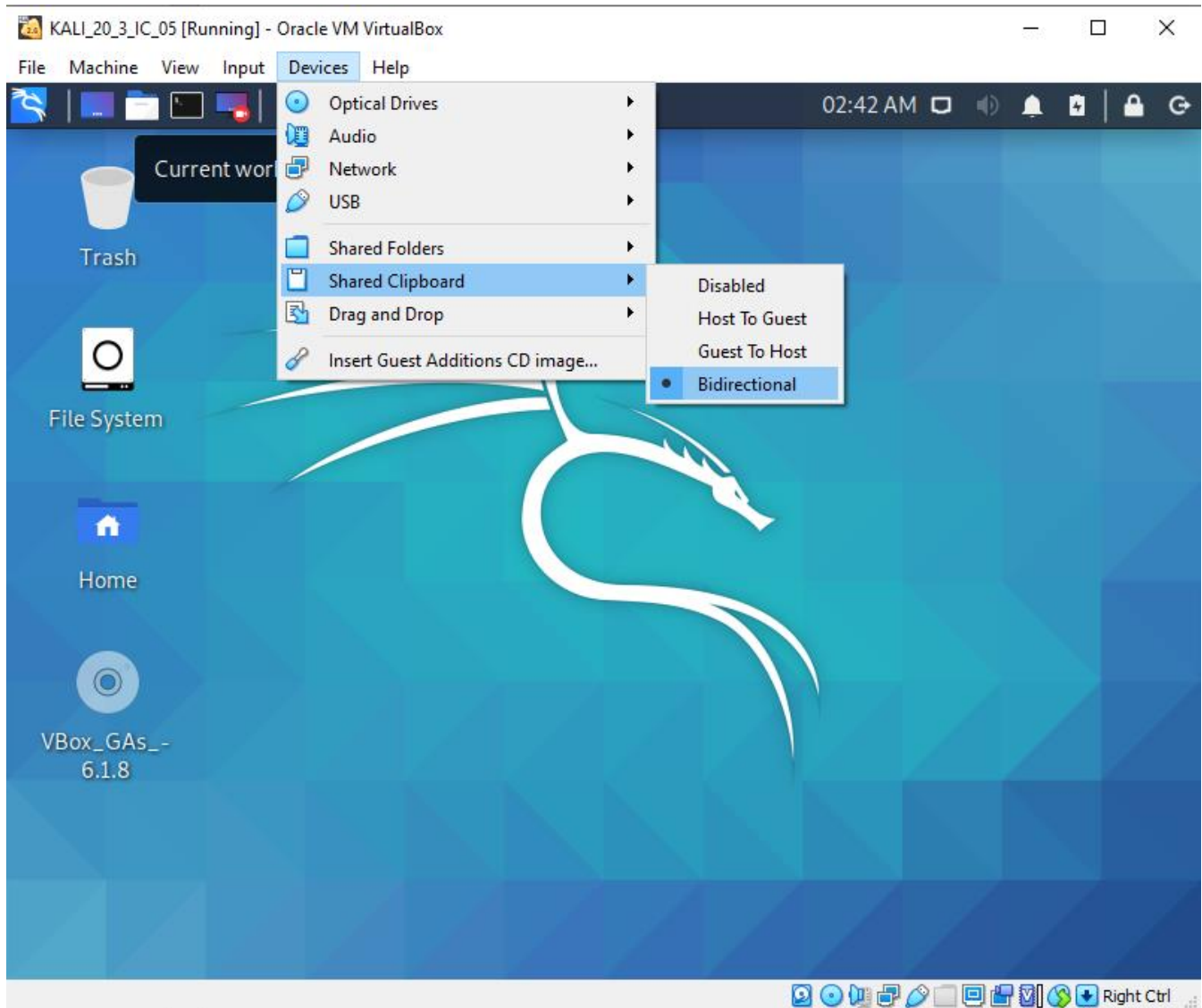
- 2 Open Notepad on the host machine and write some text.



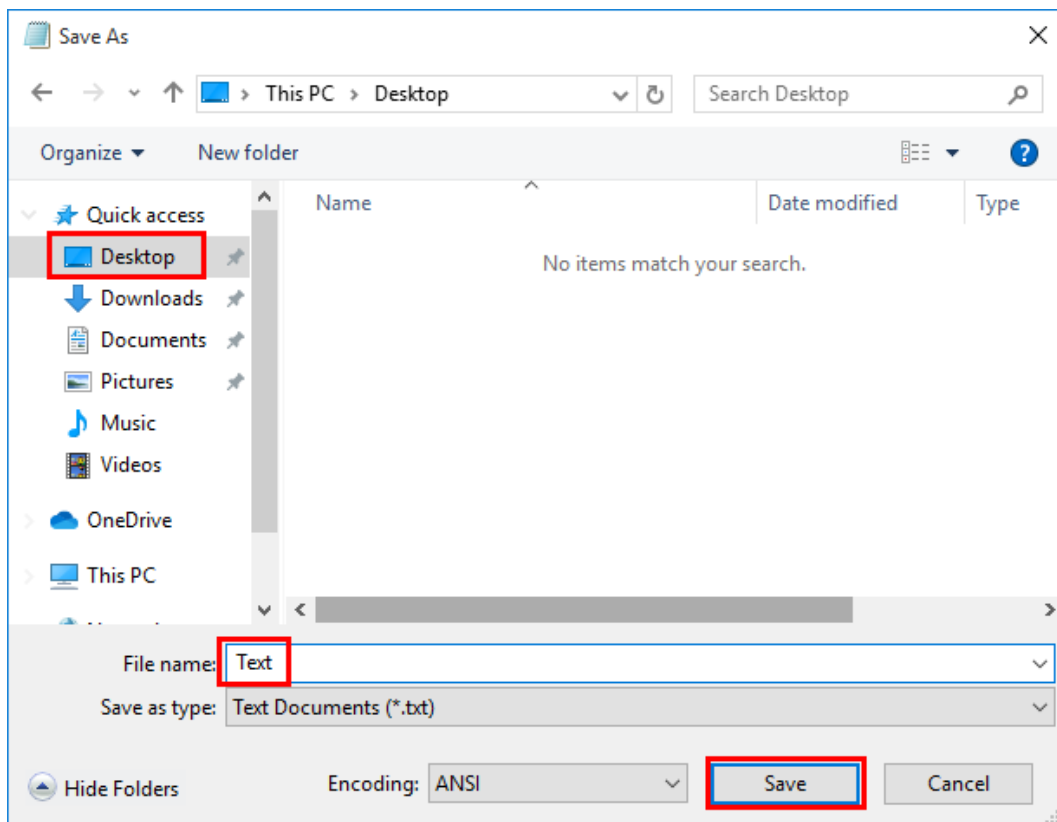
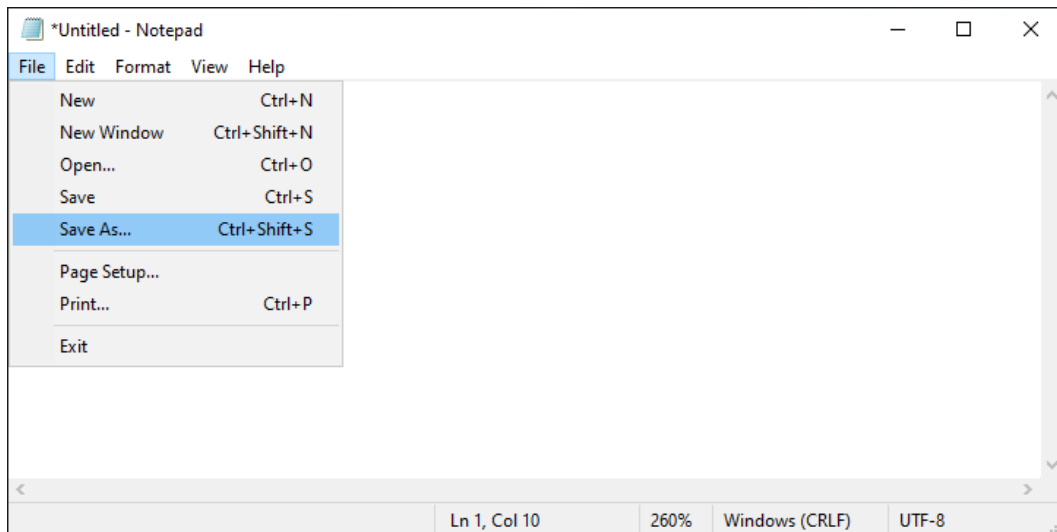
- 3 Copy the text and open Text Editor on the virtual machine. Try to paste the text in the application. Note that nothing is pasted.



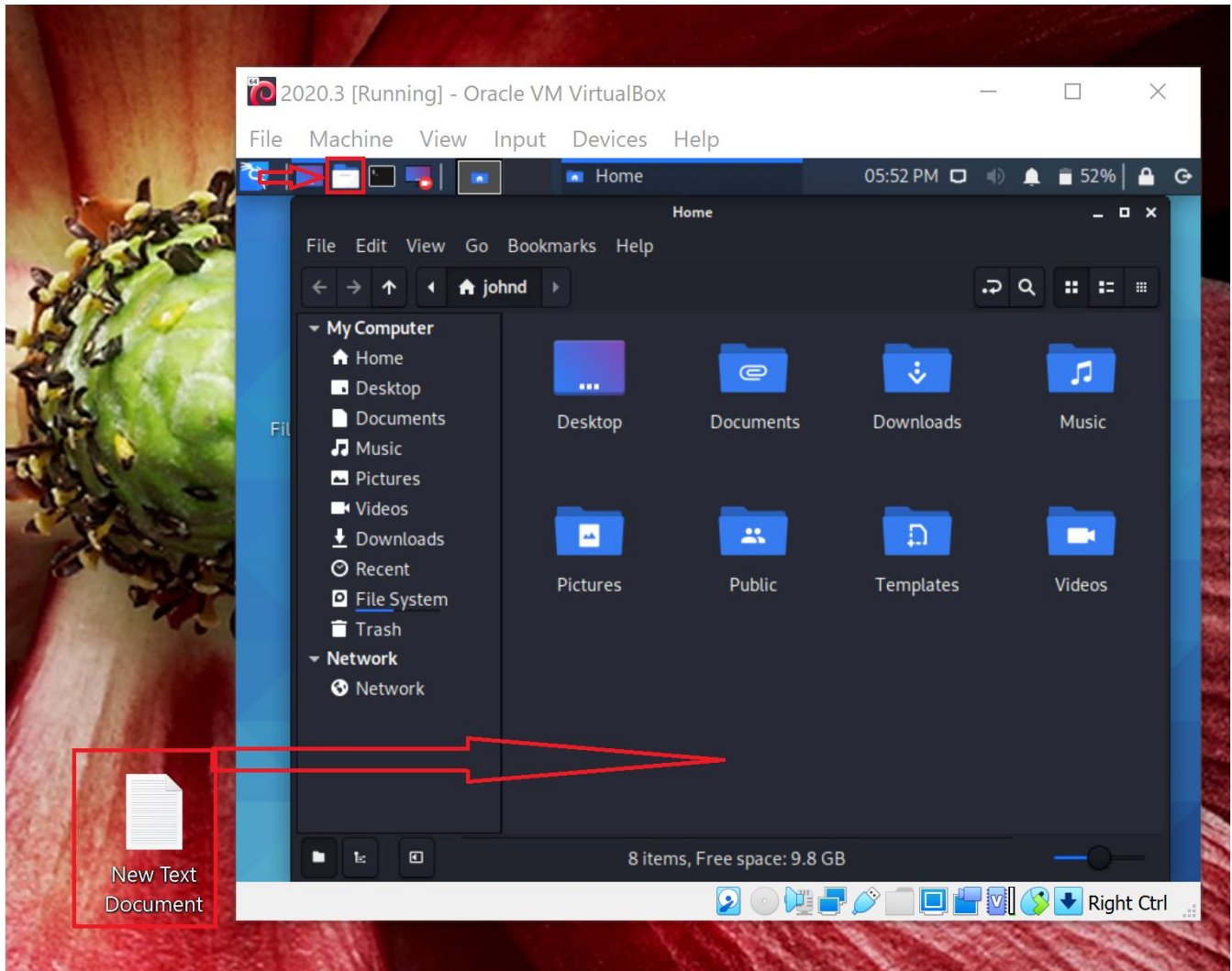
- 4 From the virtual machine's menu, click **Devices**, place the mouse over **Shared Clipboard**, and select **Bidirectional**. Repeat step 3 and note that the text is pasted this time.



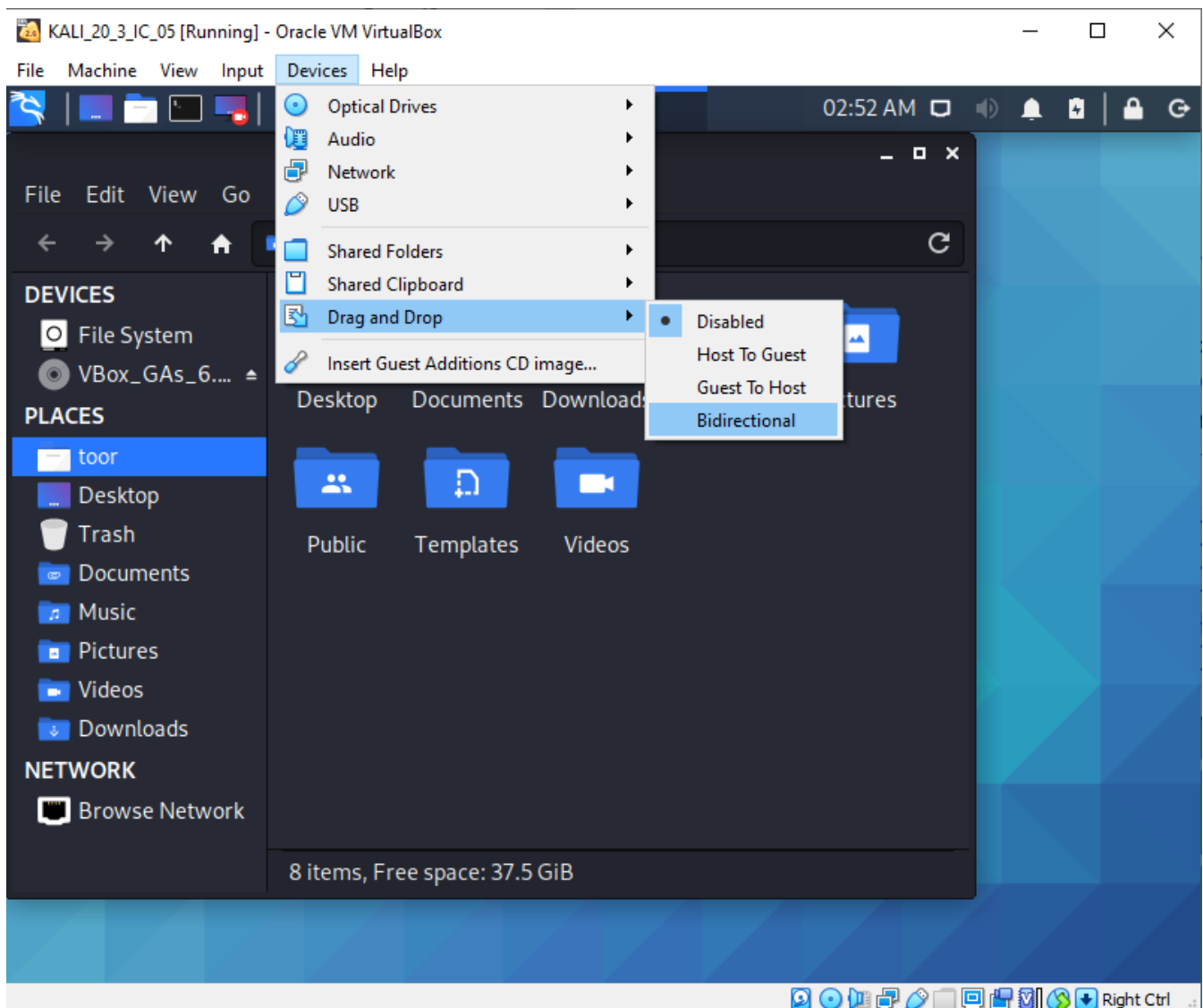
- 5 On the host machine, save the text file to the desktop. Click **File > Save As...** Make sure to select **Desktop** as the location, name the file, and click **Save**.



- 6 Open a File Manager window by clicking the *File Manager* icon in the task bar as indicated below. Then, try to drag the saved file from the host's desktop to the virtual machine's directory. Note that it does not transfer the file.

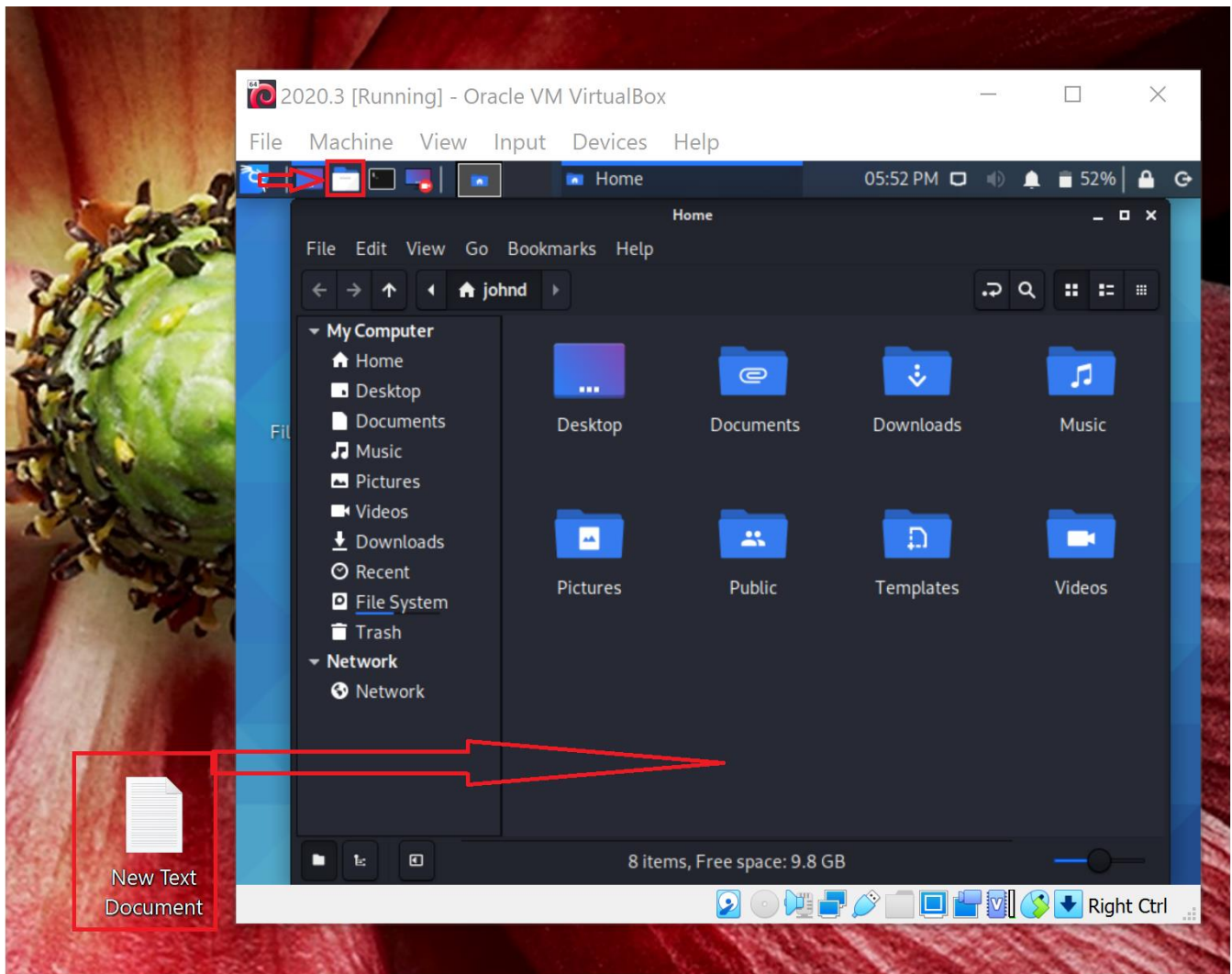


- 7 From the virtual machine's menu, click **Devices**, place the mouse over **Drag and Drop**, and select **Bidirectional**.

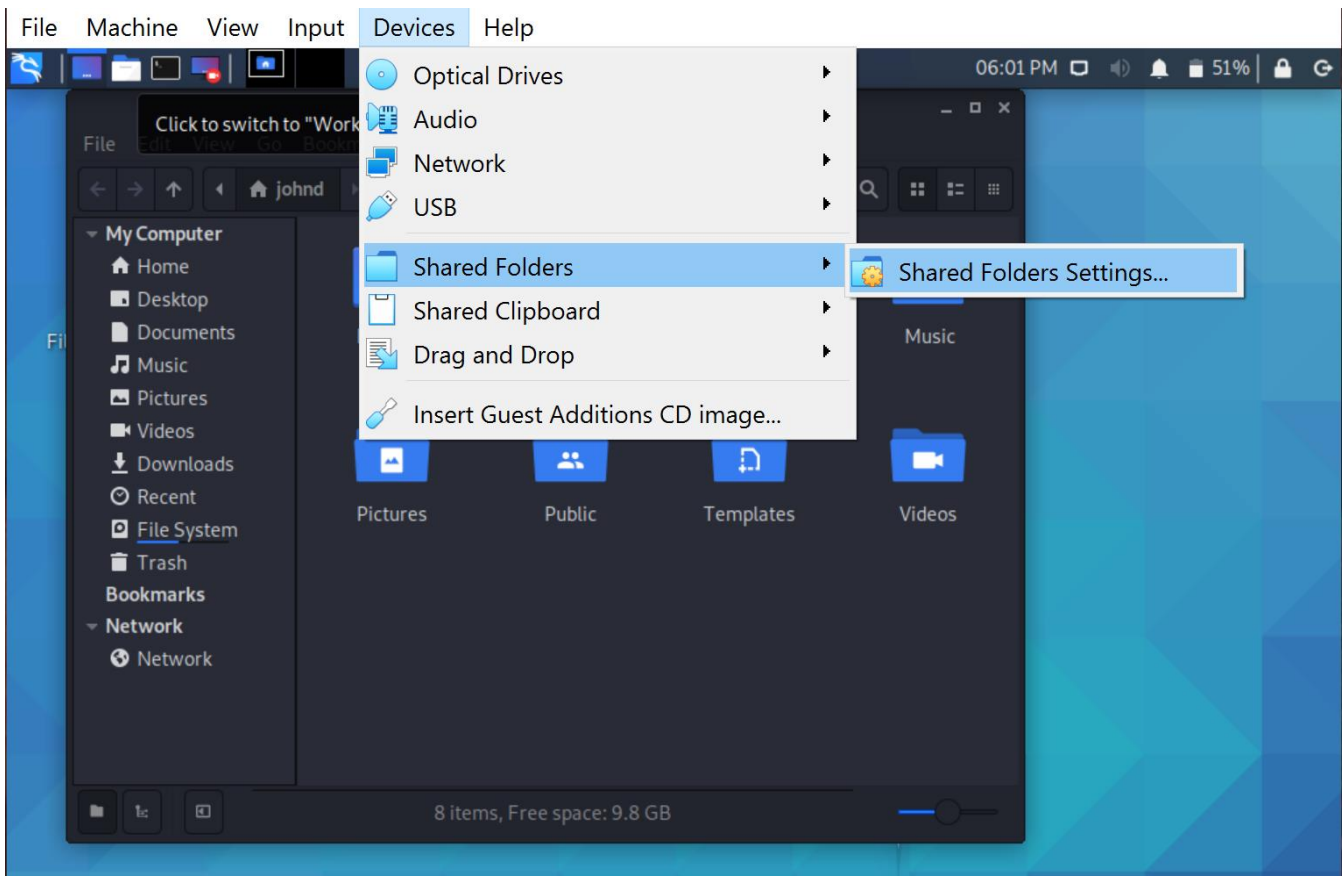




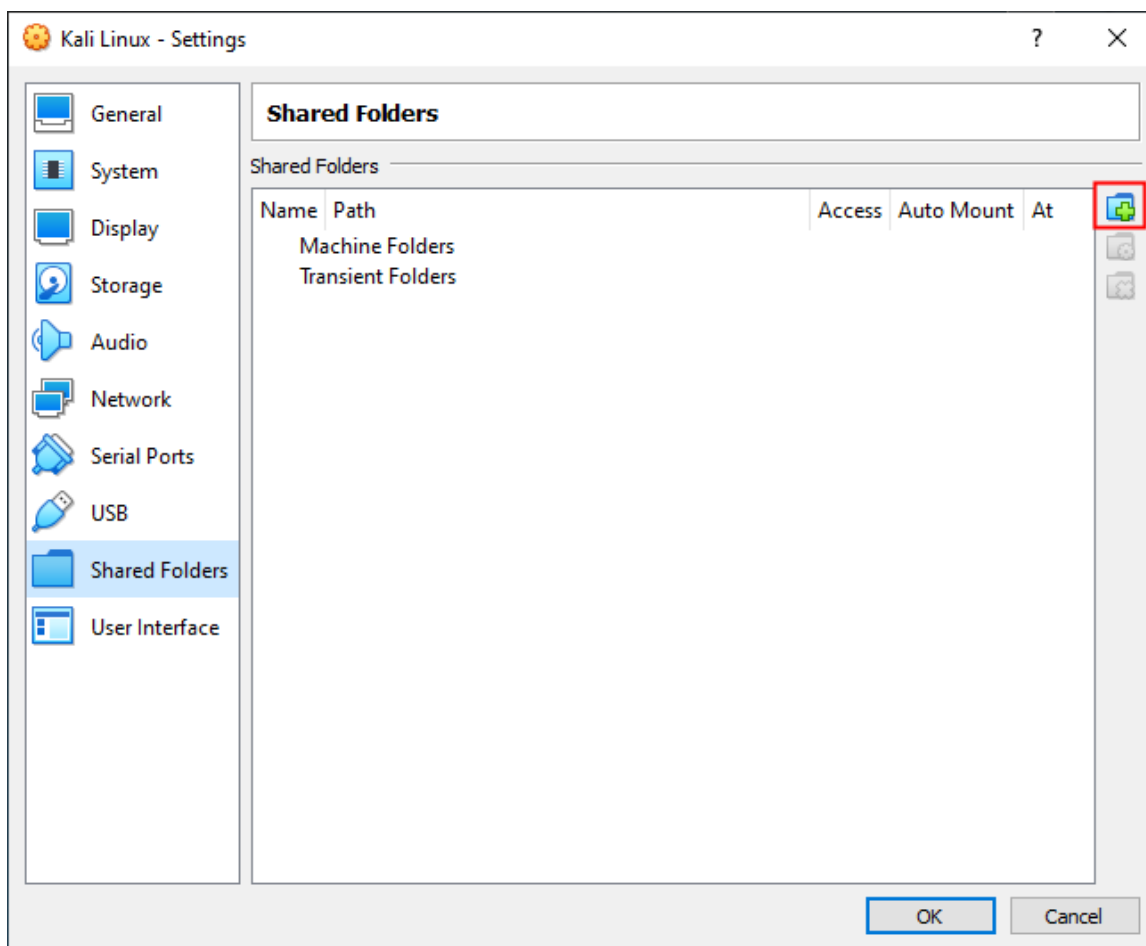
- 8 After enabling bidirectional drag-and-drop, you will notice that you are able to copy/move the file from the host onto the Kali Linux guest machine.

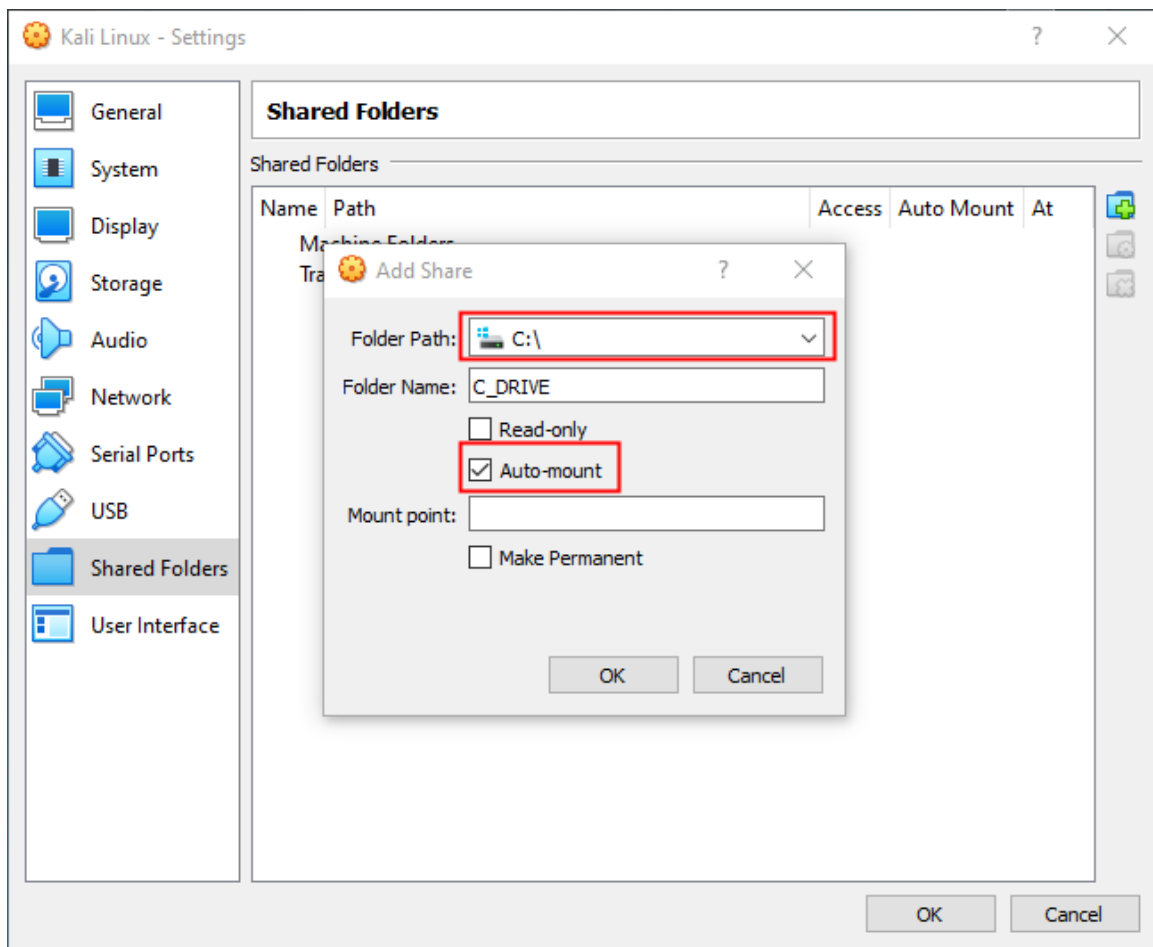


- 9 There is an option to share directories between the host and the virtual machine. On the virtual machine, click **Devices**, place the mouse over **Shared Folders**, and click **Shared Folders Settings...**



- 10** In the **Settings** window, click the add folder icon. Then select the path for the folder you want to share, select **Auto-mount**, and click **OK** in both windows.





- 11** From the terminal, issue the command ***sudo nemo*** then click the shared folder you created. Note that you can see files from the host from within the guest Kali Linux VM.

