Embedded Linux and Yocto

&

Linux Security

Virtual Machine Set up Instructions

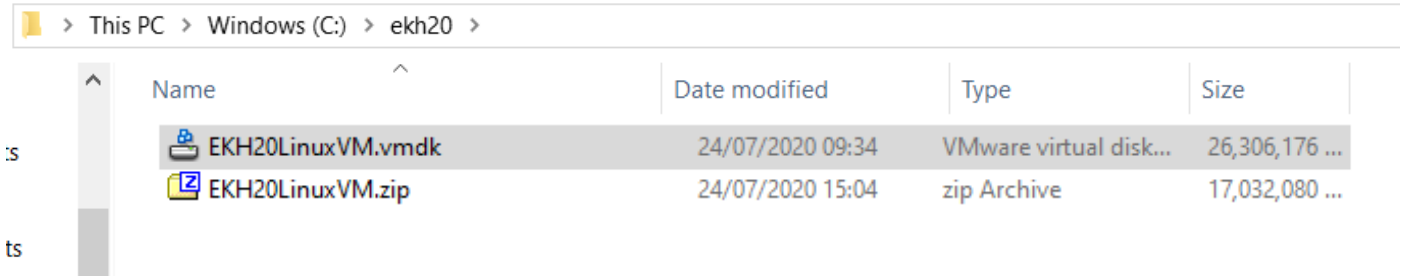
Introduction

- This short presentation provides instructions on how to set up the virtual machines used for the practical exercises for the Doulos Embedded KnowHow workshops:
  - Embedded Linux and Yocto Stream
  - Embedded Linux Security Stream

- The VM can be installed using:
  - Oracle VirtualBox
  - VMWare Workstation Player/Pro
- Instructions for both follow....

Prerequisites

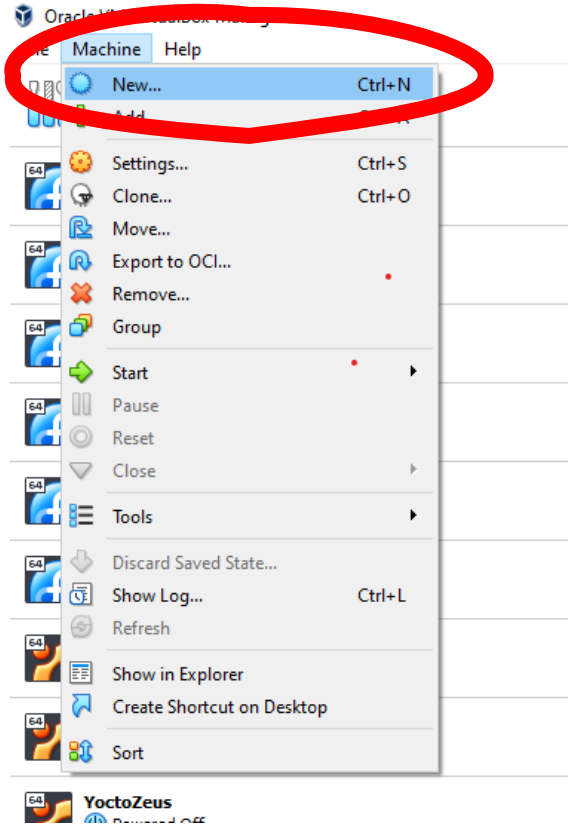
- 64-bit PC with at least 8GB of RAM and plenty of disk space:
  - Embedded Linux VM requires at least 30GB
  - Linux Security VM requires at least 15GB
- Can be installed on external USB3 HDD if required
- Oracle VirtualBox or VMware Workstation Player/Pro installed
- Zip file containing the appropriate VM disk file downloaded and extracted, e.g.



- See your joining instructions for a link to download the appropriate file

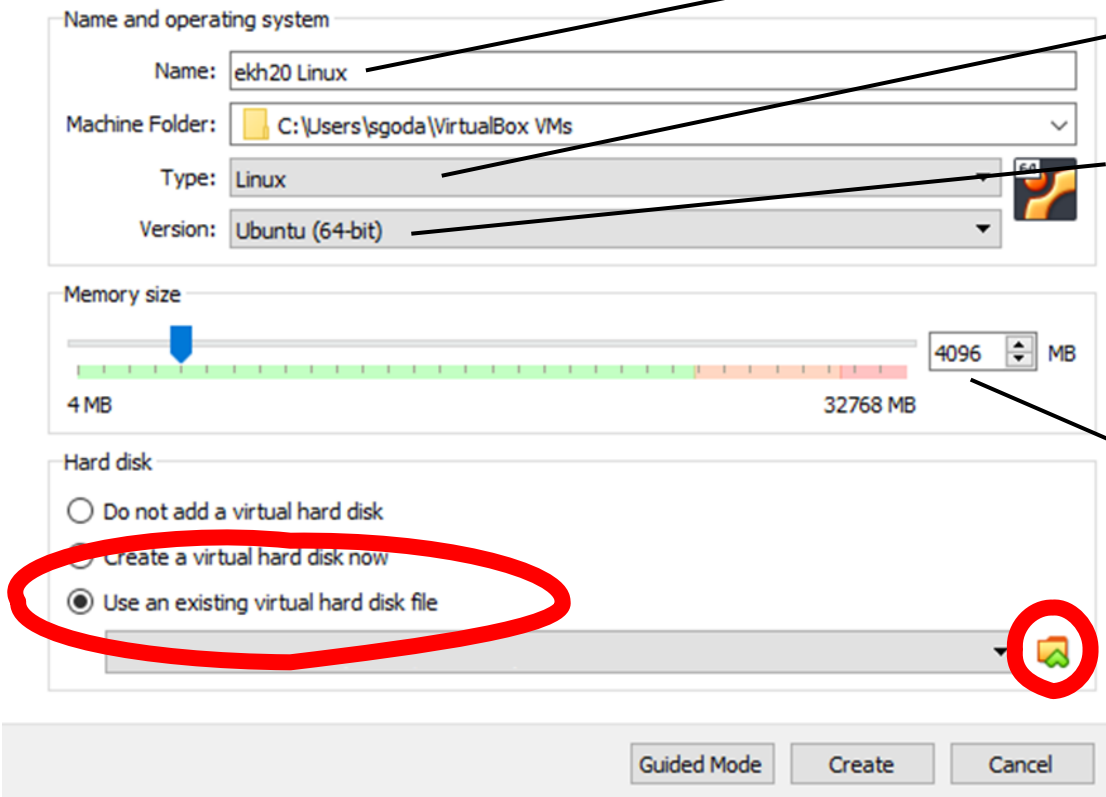
Oracle VirtualBox: Creating the VM

Open VirtualBox and select **Machine > New...** to create the VM:



Oracle VirtualBox: Creating the VM

In the resulting dialog, make the following settings:



a sensible **Name**

Type is Linux

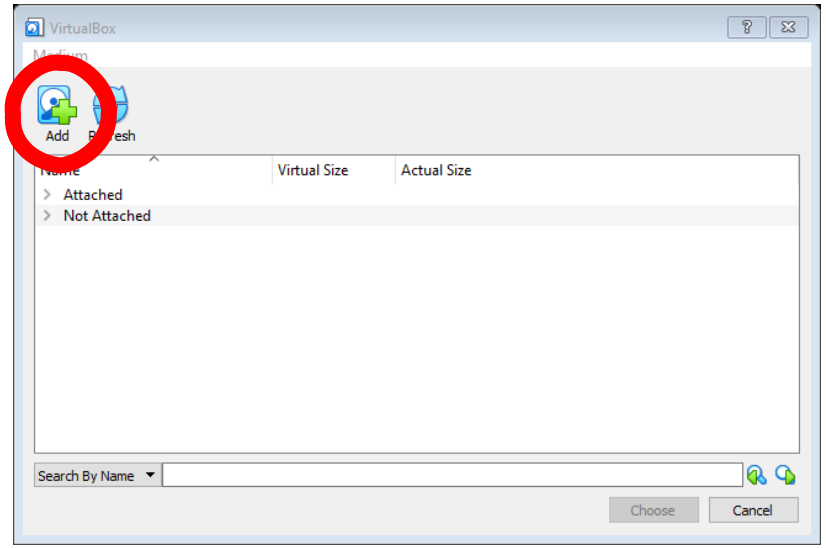
Version is:
Linux Stream: **Ubuntu (64-bit)**
Security Stream: **Other Linux (64-bit)**

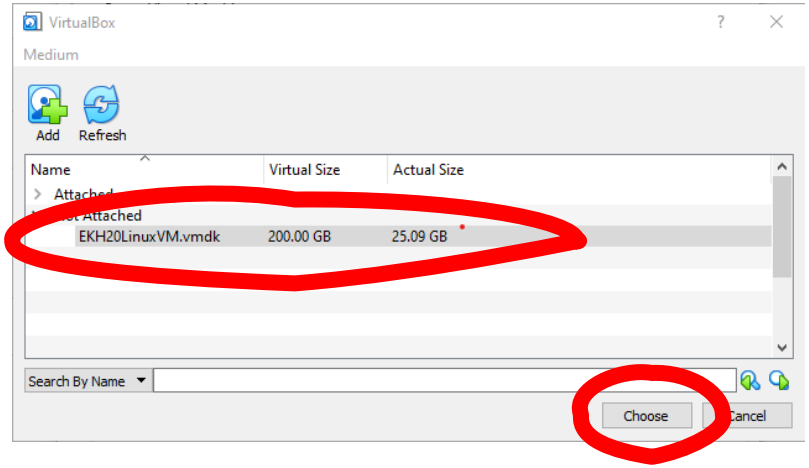
Select at least **4GB** of memory

Select **Use an existing virtual hard disk file** and then click the browse button

Oracle VirtualBox: Creating the VM

This opens a new dialog - click **Add** to find the VM disk file you downloaded (via the link in the joining instructions):

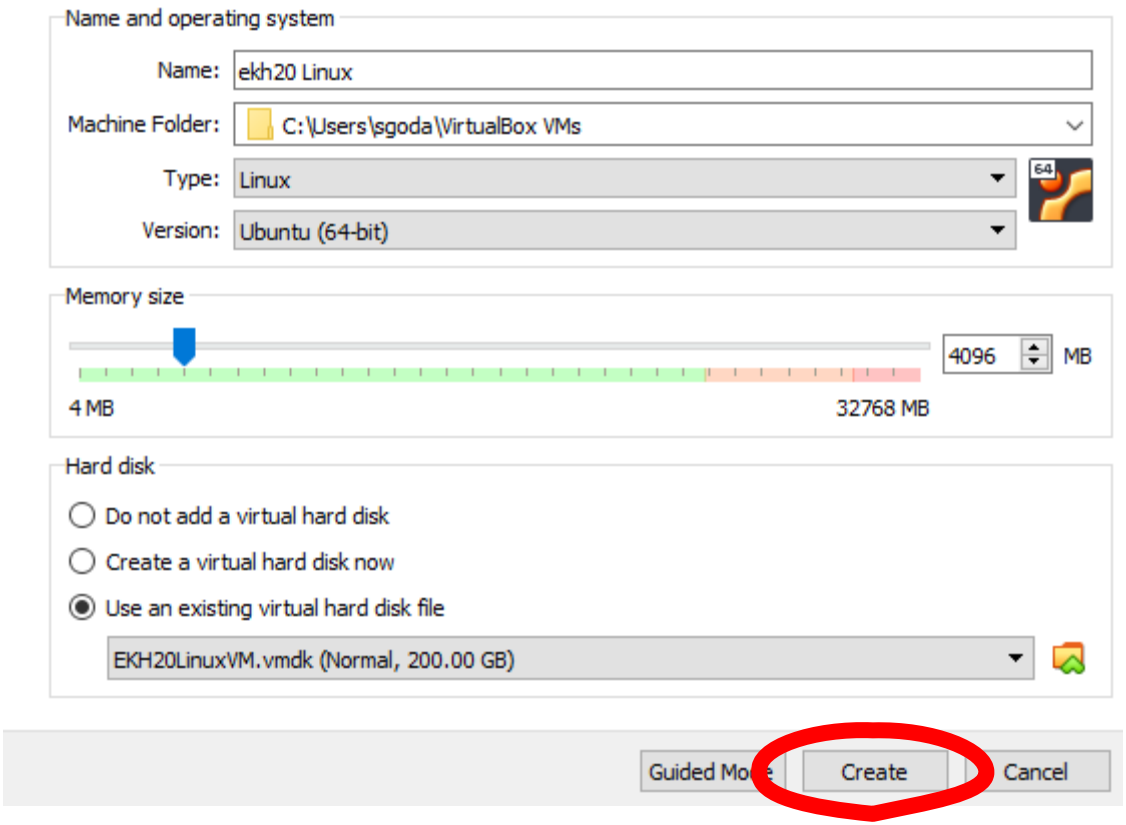




Select the appropriate .vmdk file and select **Choose**

Oracle VirtualBox: Creating the VM

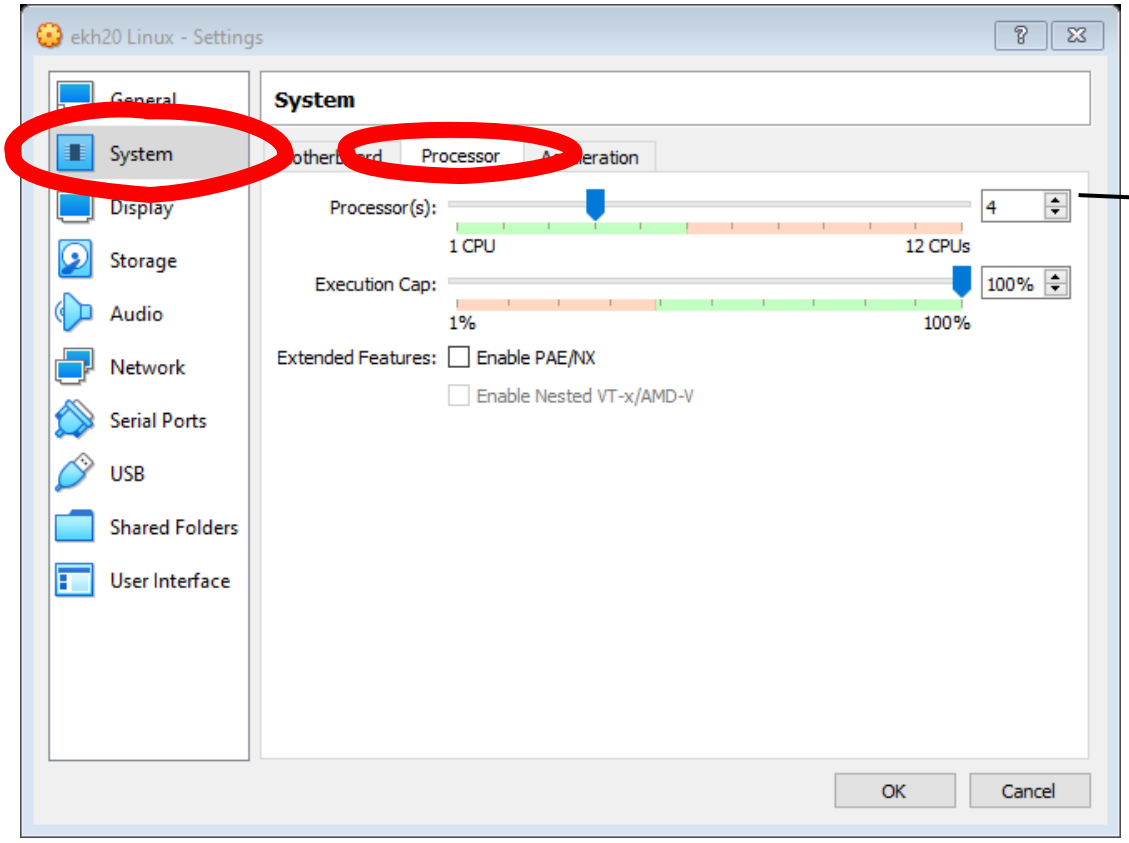
Now click **Create** to create the VM:



Oracle VirtualBox: Creating the VM

Now select **Machine > Settings...** to make some further adjustments

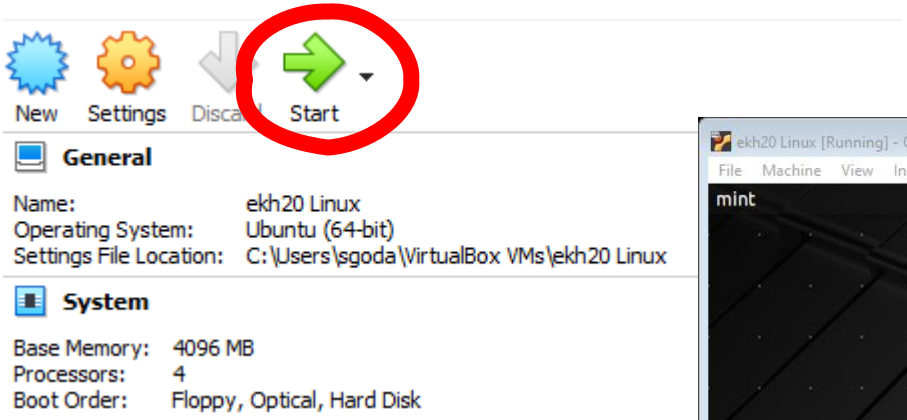
In the resulting dialog select **System** and then the **Processor** tab:



Select at least 4 CPUs if you can, then click **OK**

Oracle VirtualBox: Starting the VM

Click **Start** to open the VM:



Log in as user **builduser** with password **tux**

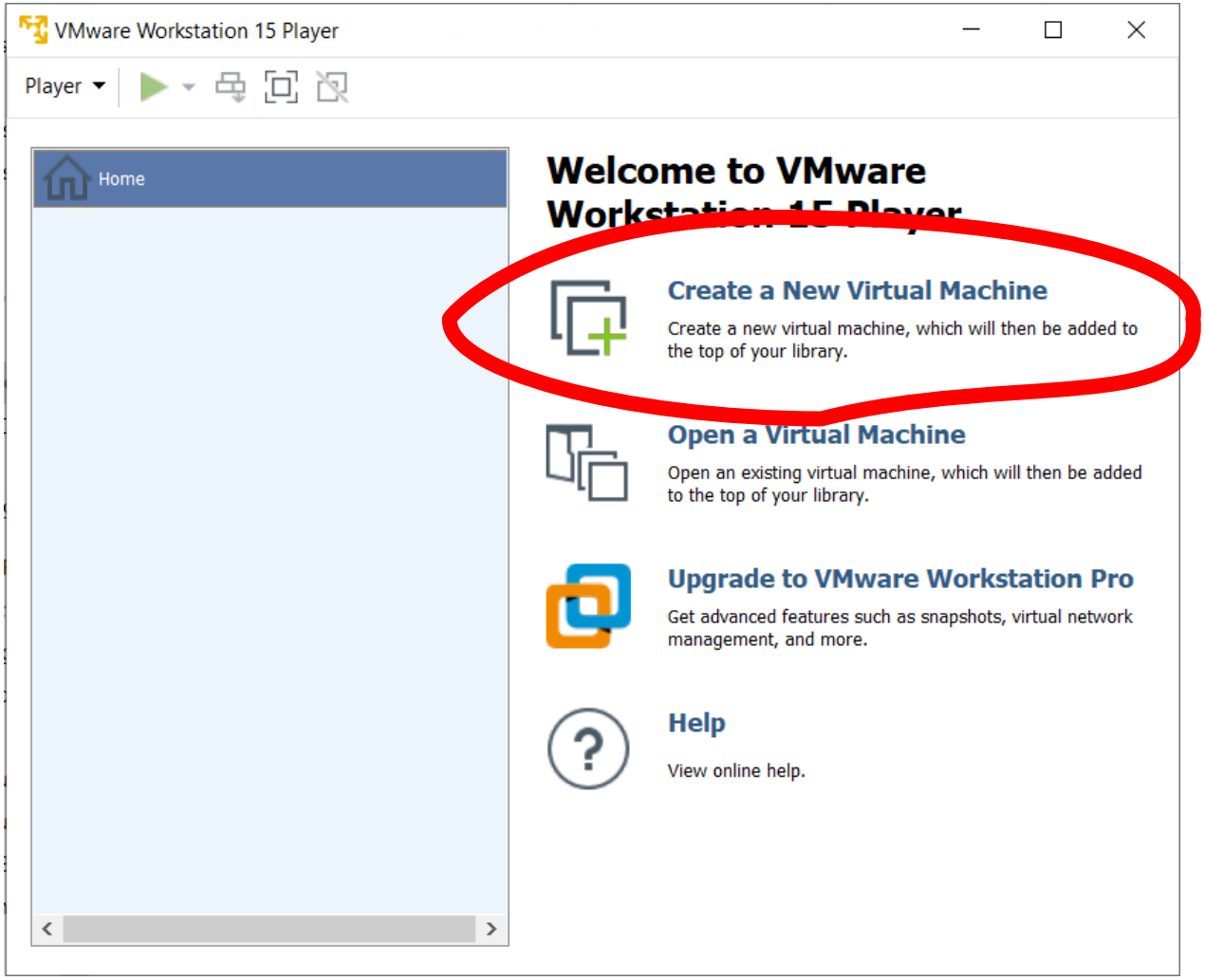
Oracle VirtualBox: Using the VM

- Further VM usage tips:
  - To resize the Linux VM desktop the VirtualBox Guest Additions need to be installed:
    - Select **Devices > Insert Guest Additions CD Image...**
    - Follow the onscreen prompts, entering the 'builduser' password (tux) when prompted
    - You should then be able to expand the VirtualBox window to any size but you may find the VM desktop background doesn't resize correctly
      - You can resolve this by right-clicking in the top left of the desktop and selecting **Change Desktop Background** - and then choose a new image
  - Networking is configured by default in the machine but nothing should need to be downloaded for these exercises

- Refer to the Doulos Workbook for the full instructions for the exercises

VMWare Workstation Player: Creating the VM

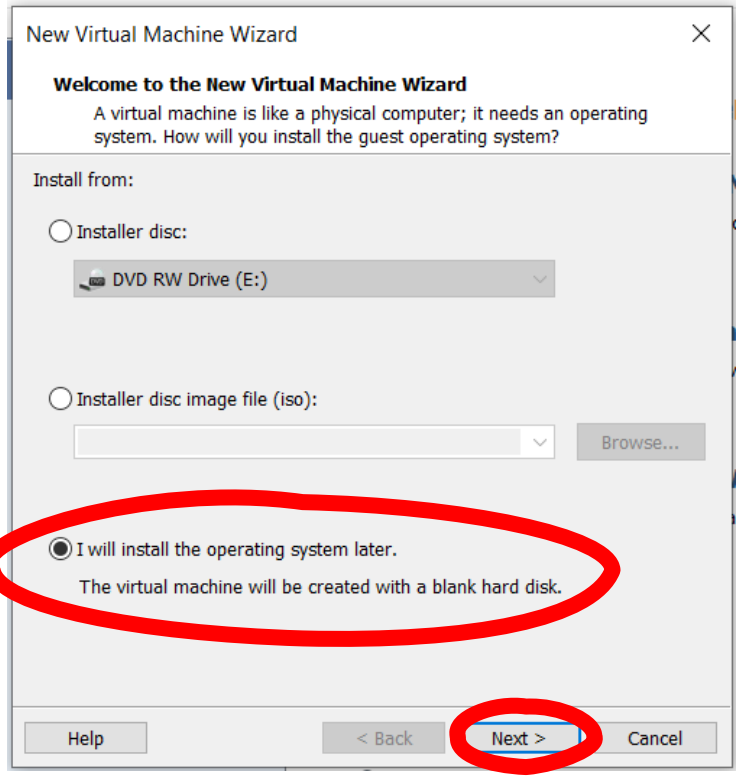
Open VMware Workstation Player and select **Create a New Virtual Machine**:

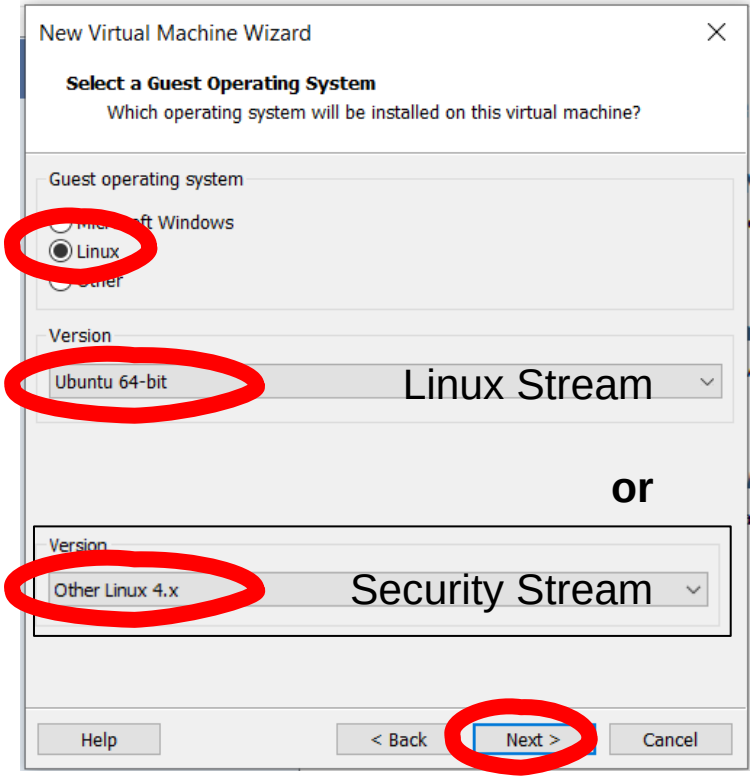


VMWare Workstation Player: Creating the VM

Create the VM with a blank hard disk (we'll replace it later):

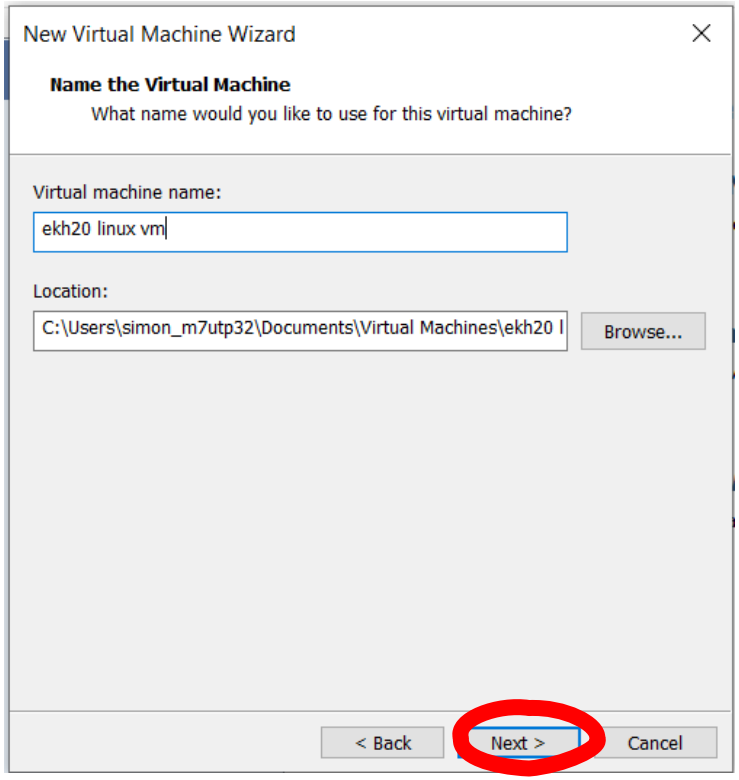
The guest OS is:
Linux Stream: **Ubuntu 64-bit Linux**
Security Stream: **Linux Other 4.x**



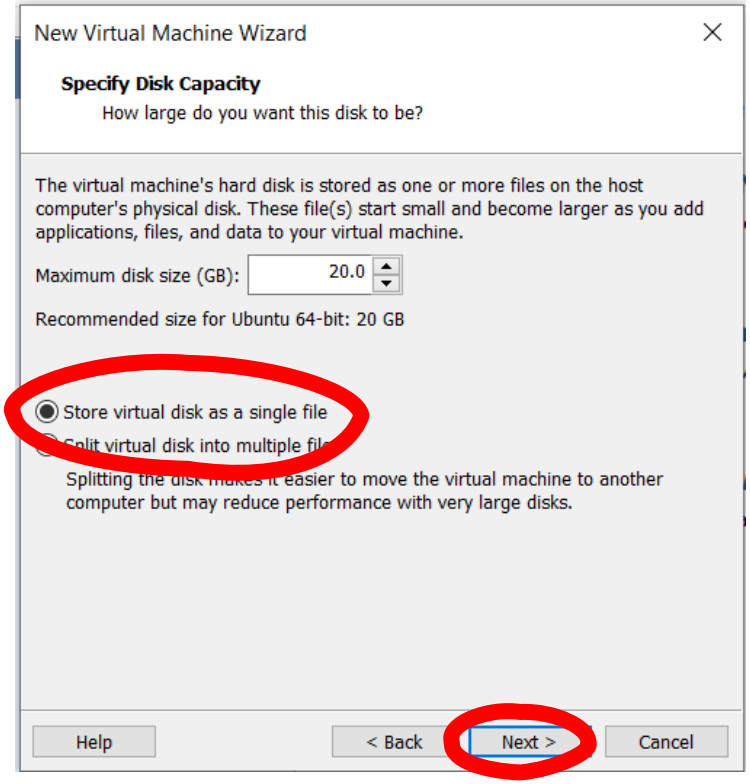


VMWare Workstation Player: Creating the VM

Change the name and location if you wish:

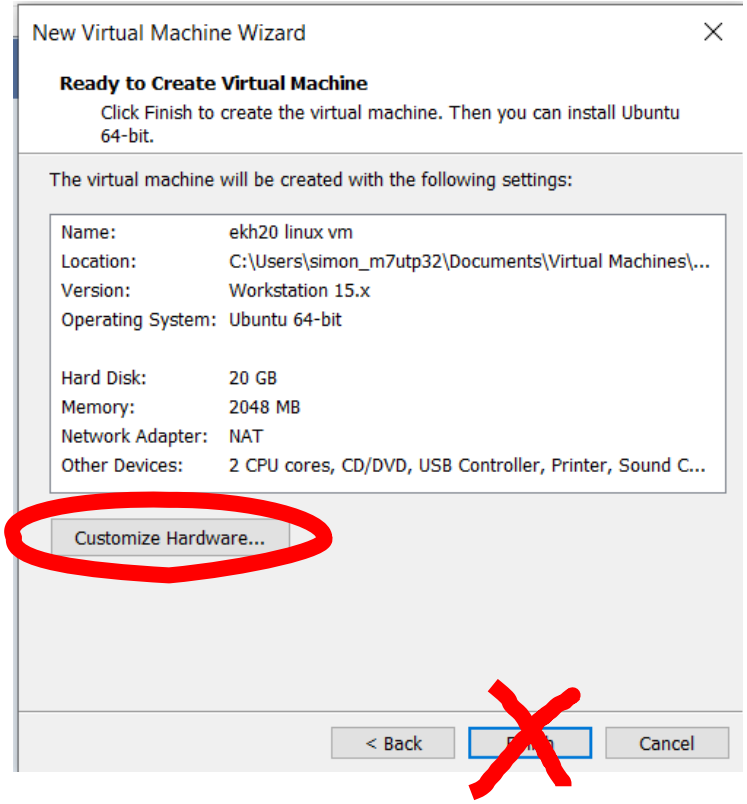


Select **Store virtual disk as a single file**:

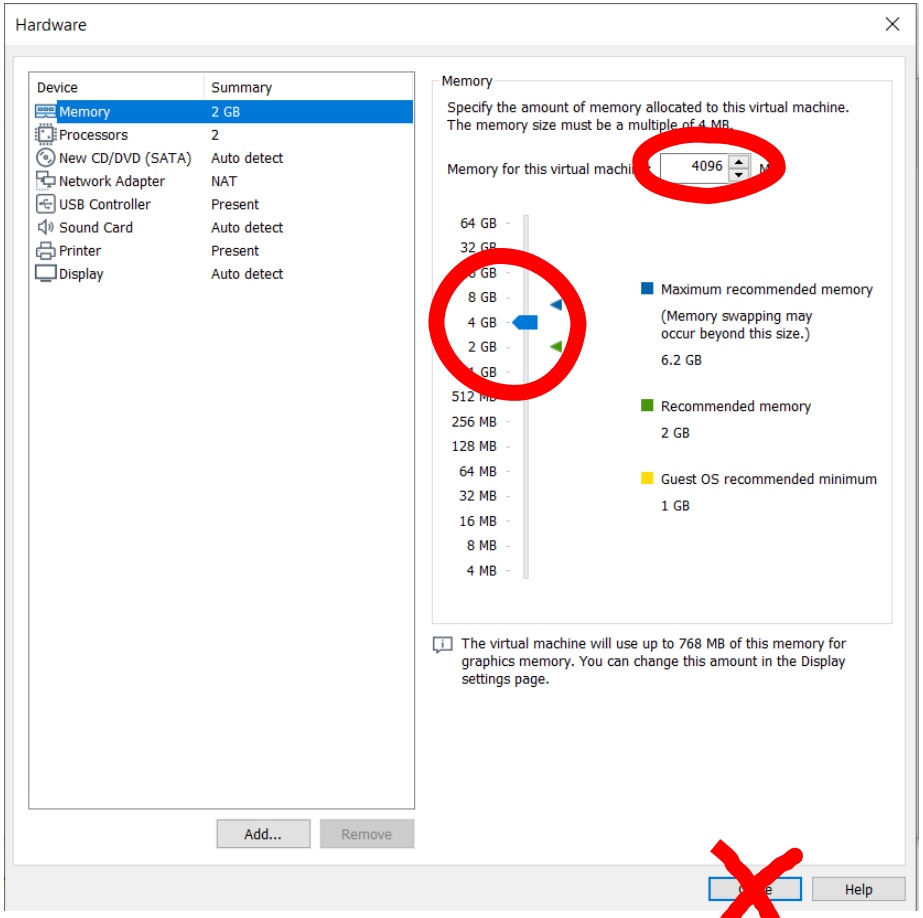


VMWare Workstation Player: Creating the VM

Don't click **Finish**, instead choose **Customize Hardware...**:

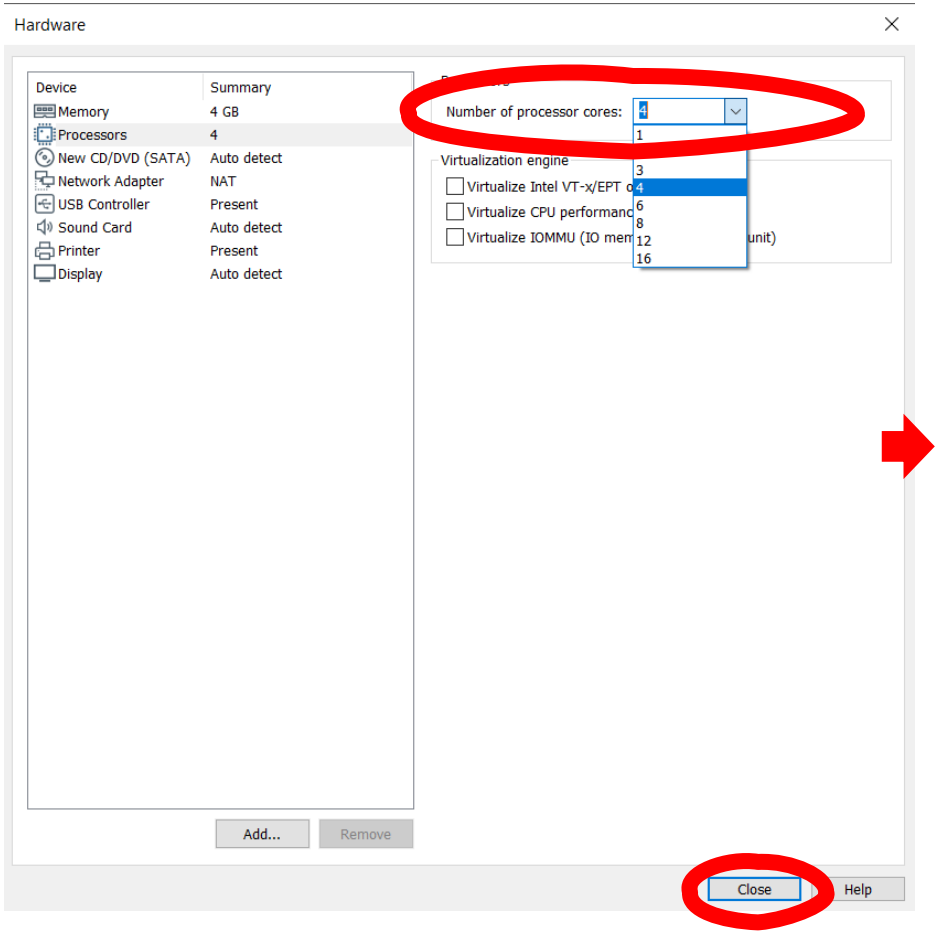


Select at least 4GB of memory (and don't click **Close** yet):

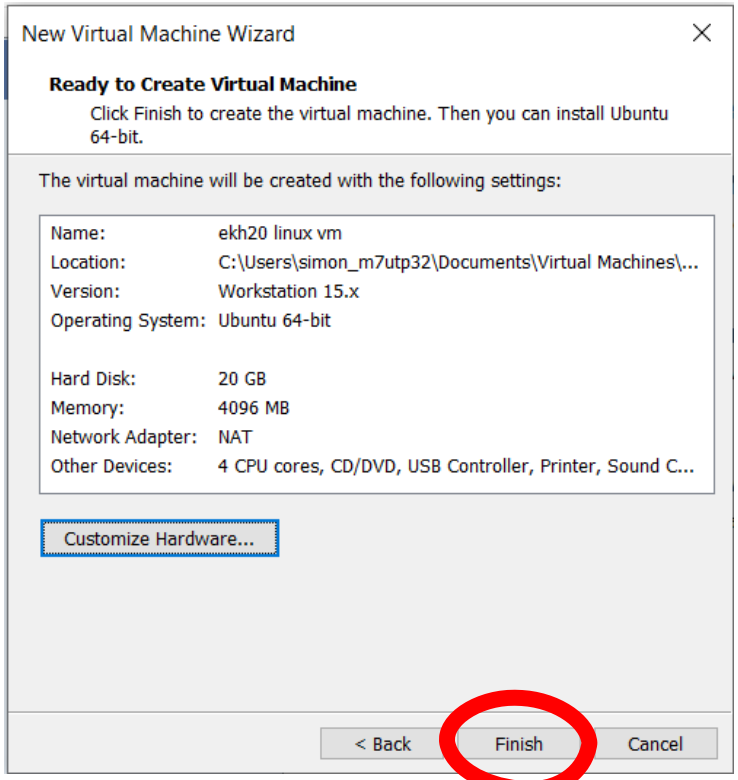


VMWare Workstation Player: Creating the VM

Select at least 4 CPUs if you can, then click **Close**:

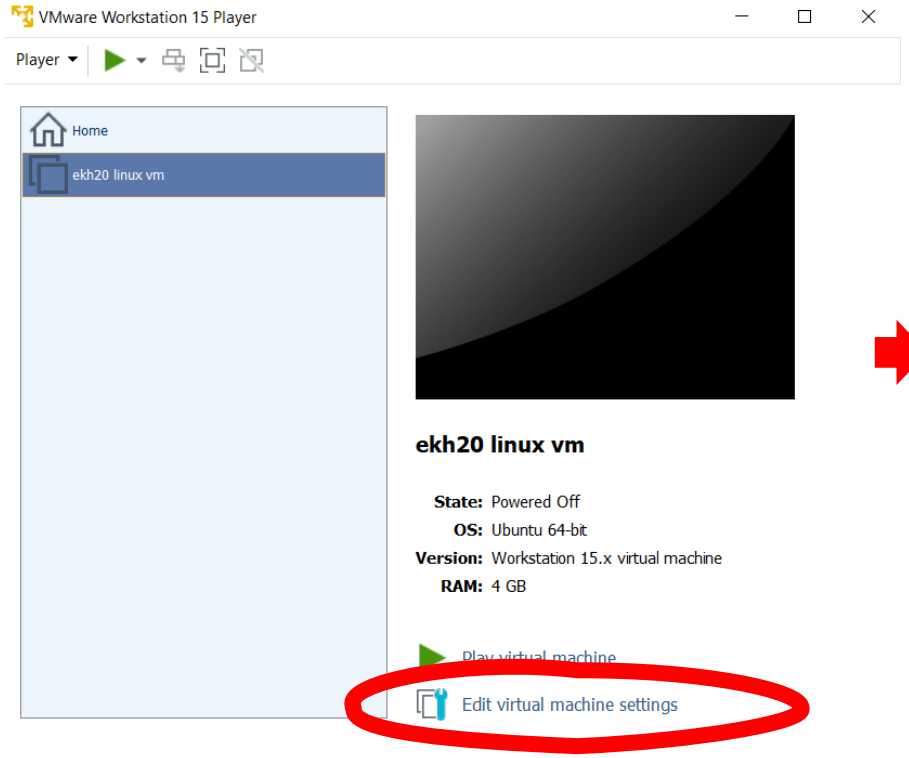


Now click **Finish**:

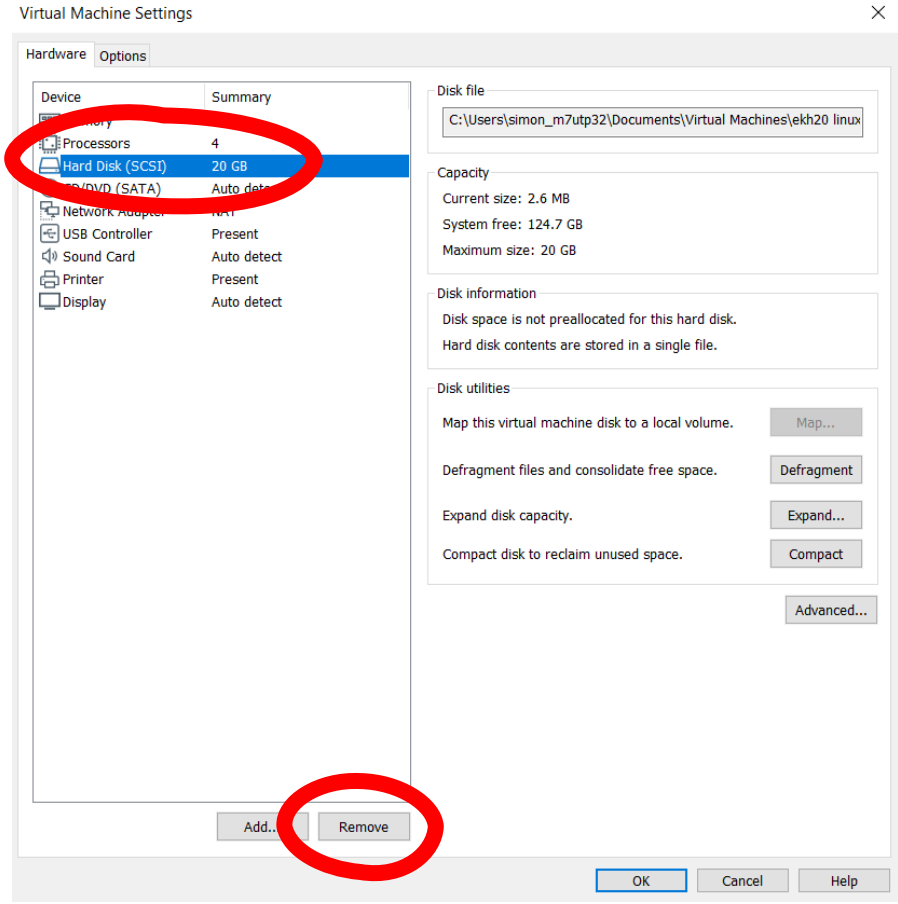


VMWare Workstation Player: Creating the VM

The VM is now created but we need to **Edit virtual machine settings** to swap the disks:

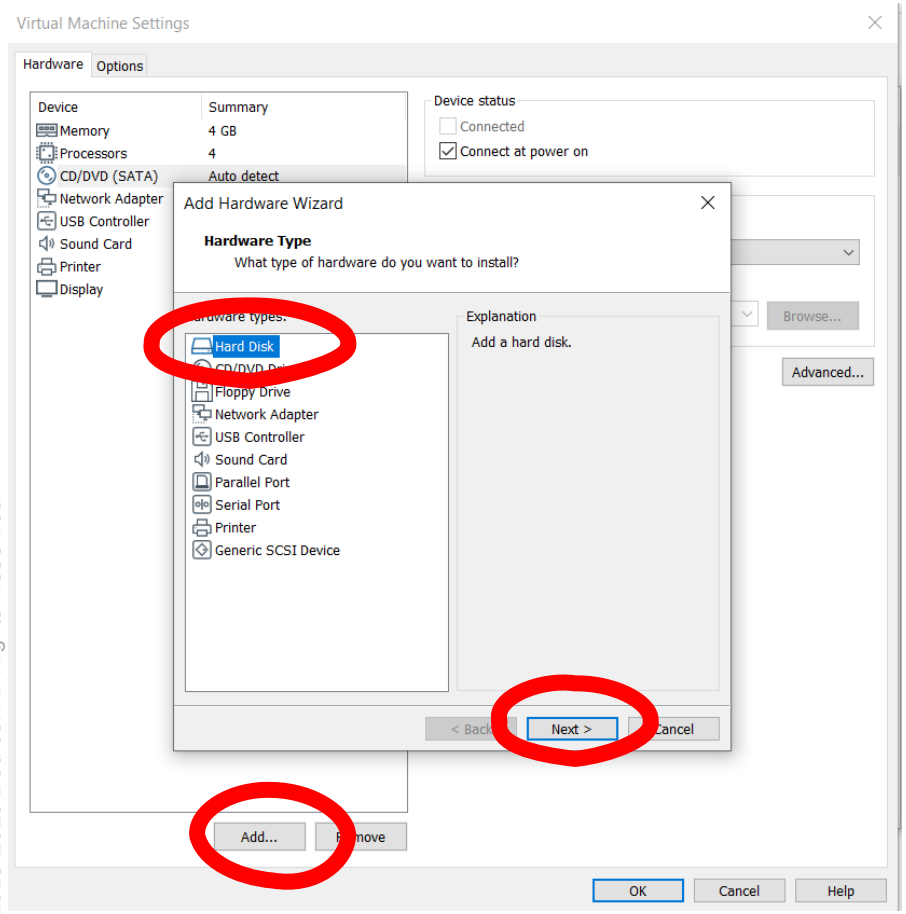


Select the existing 20 GB hard disk and click **Remove**:

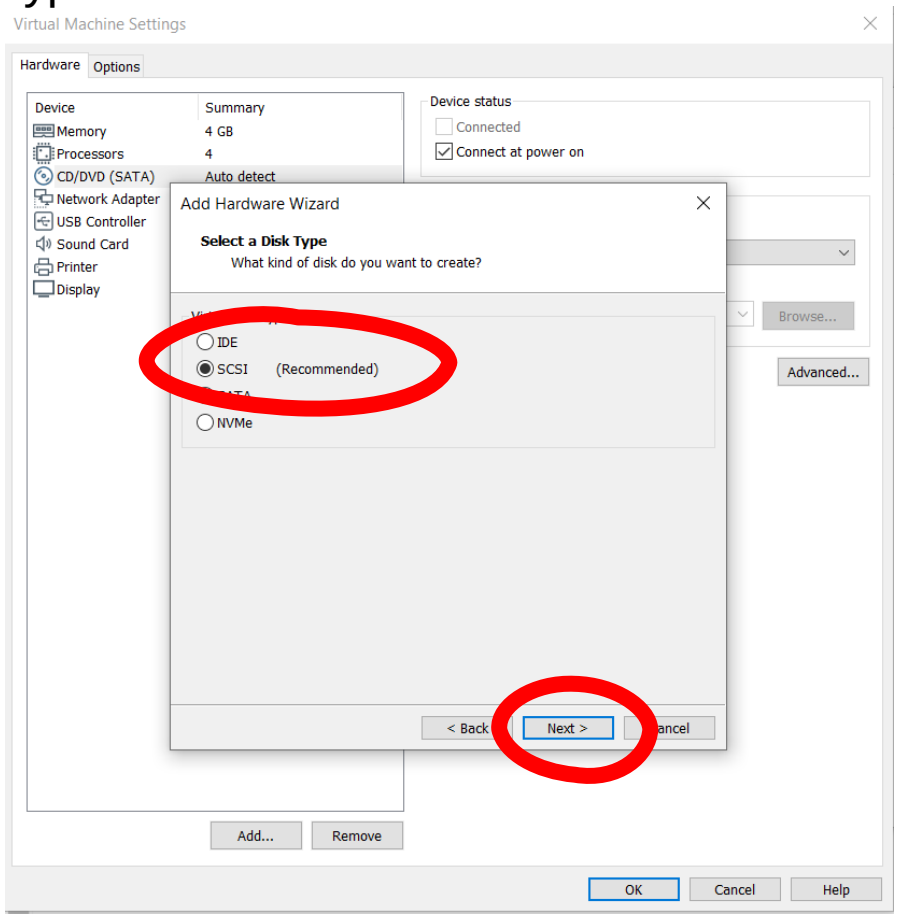


VMWare Workstation Player: Creating the VM

Click **Add...**, select **Hard Disk** and then **Next >**:

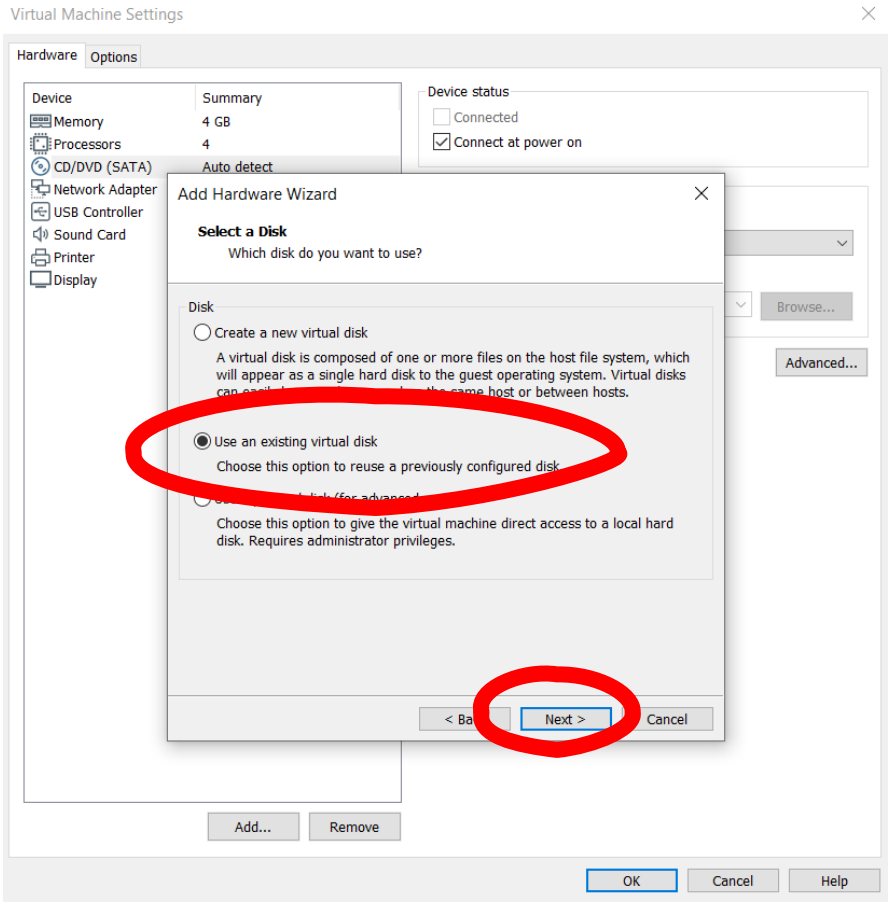


Click **Next >** again to accept **SCSI** disk type:

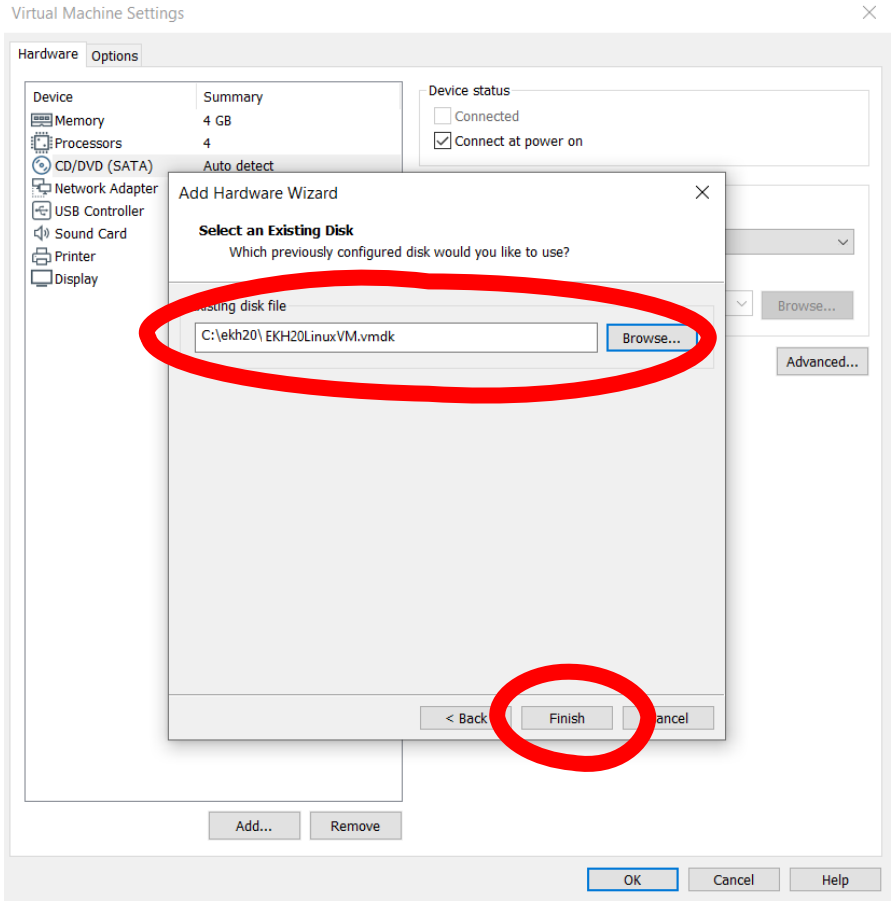


VMWare Workstation Player: Creating the VM

Select **Use an existing virtual disk** and then click **Next >**:

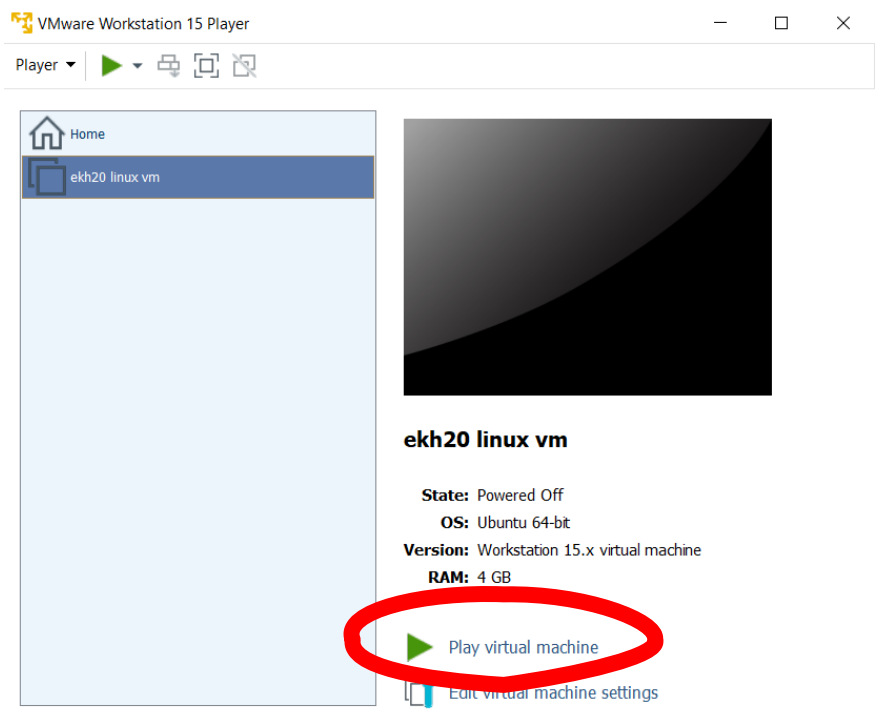


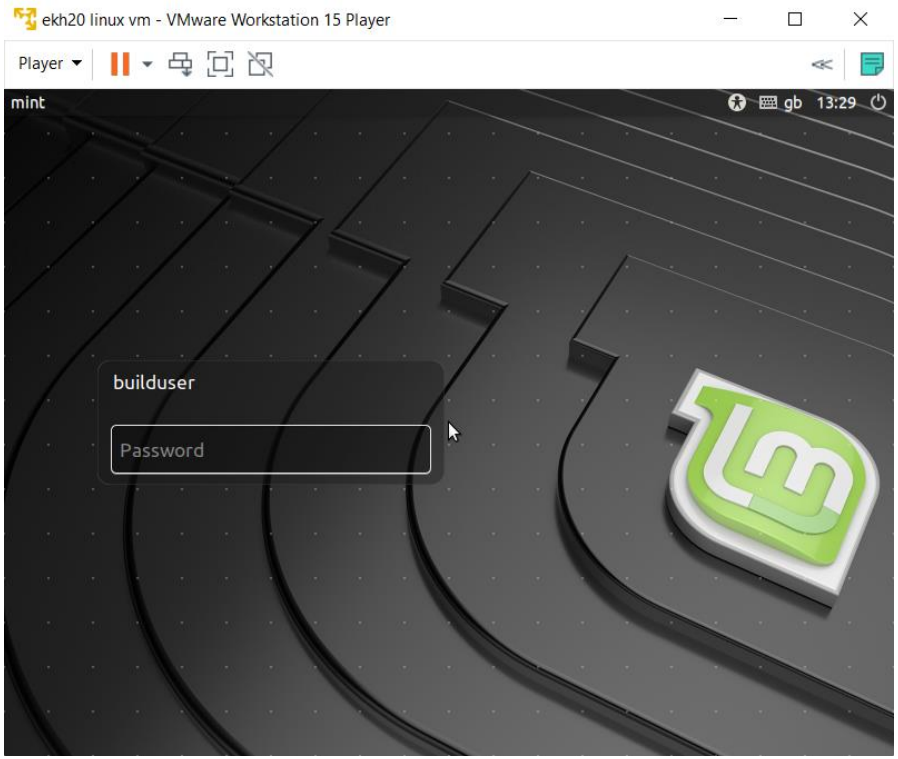
Browse... to the .vmdk file you downloaded, then click **Finish**:



VMWare Workstation Player: Starting the VM

The virtual machine can now be started:





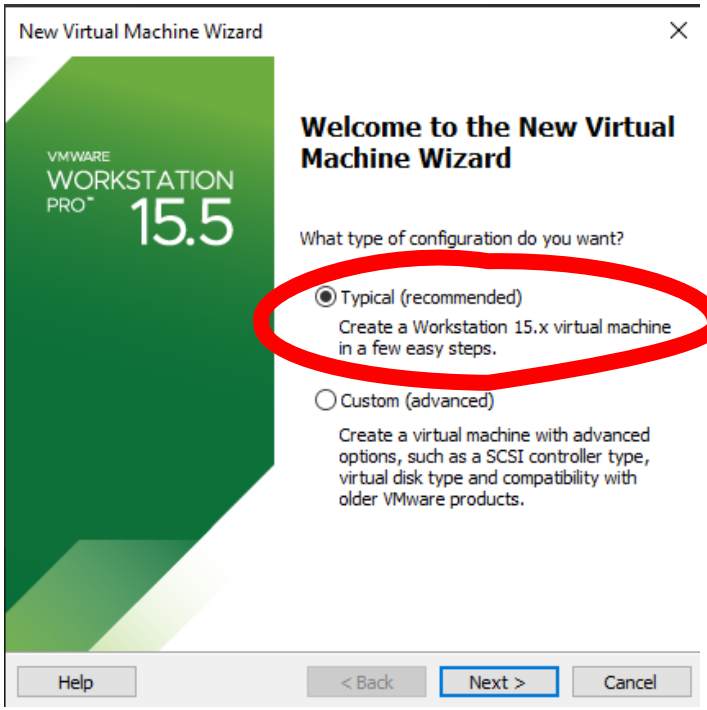
Log in as user **builduser** with password **tux**

VMWare Workstation Player: Using the VM

- Further VM usage tips:
  - You will be prompted to download and install the VMware tools - this can be done but is not required for these exercises
  - You can expand the VMware window to any size but you may find the VM desktop background doesn't resize correctly
    - You can resolve this by right-clicking in the top left of the desktop and selecting **Change Desktop Background** - and then choose a new image
  - Networking is configured by default in the machine but nothing should need to be downloaded for these exercises
- Refer to the Doulos Workbook for the full instructions for the exercises

VMWare Workstation Pro: Creating the VM

- Creating a new VM in VMWare Workstation Pro follows similar steps as in Workstation Player:
  - Start from **File > New Virtual Machine...**
  - Select a **Typical (recommended)** configuration and then follow the steps as shown for Workstation Player

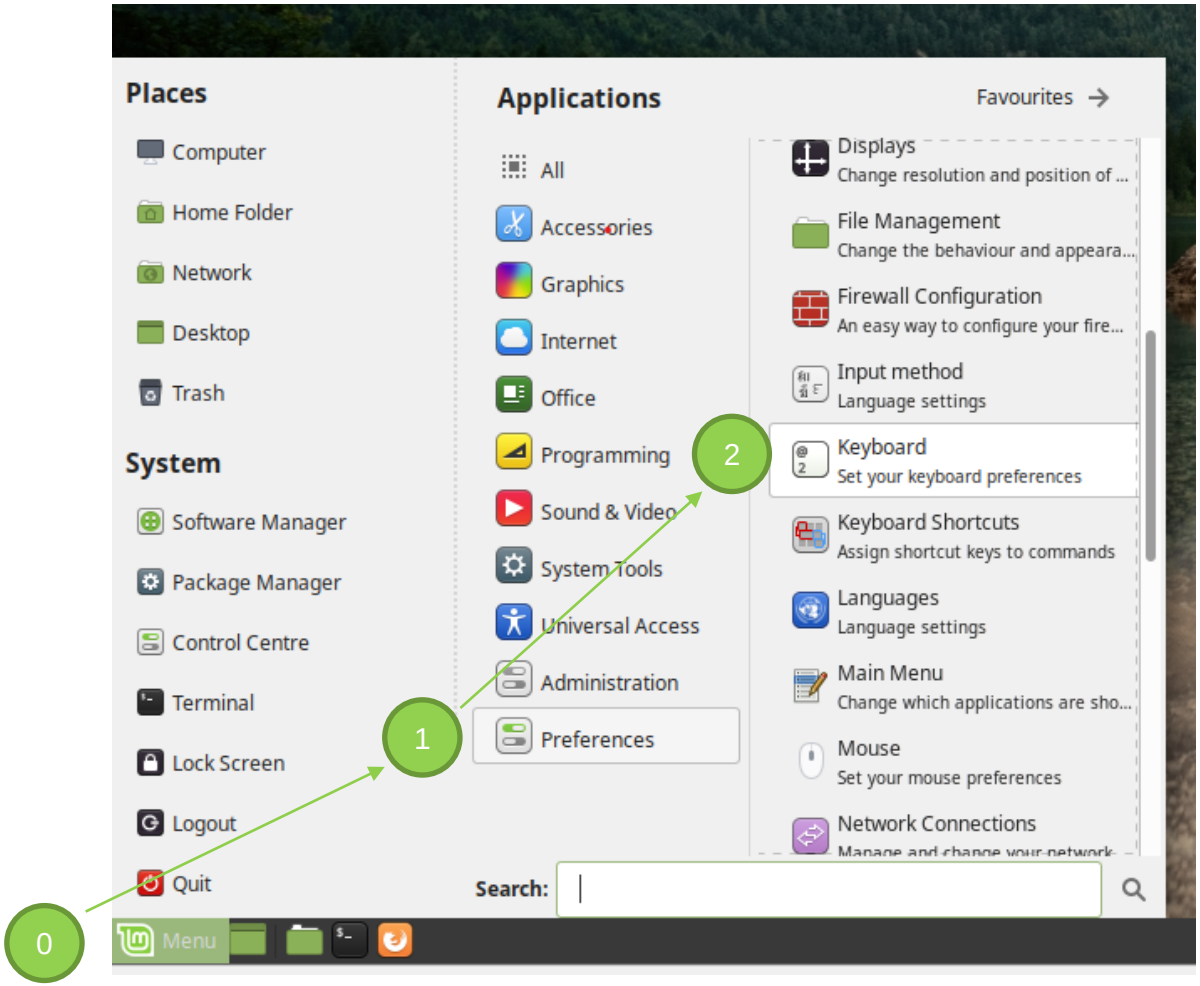


Changing Keyboard Layout

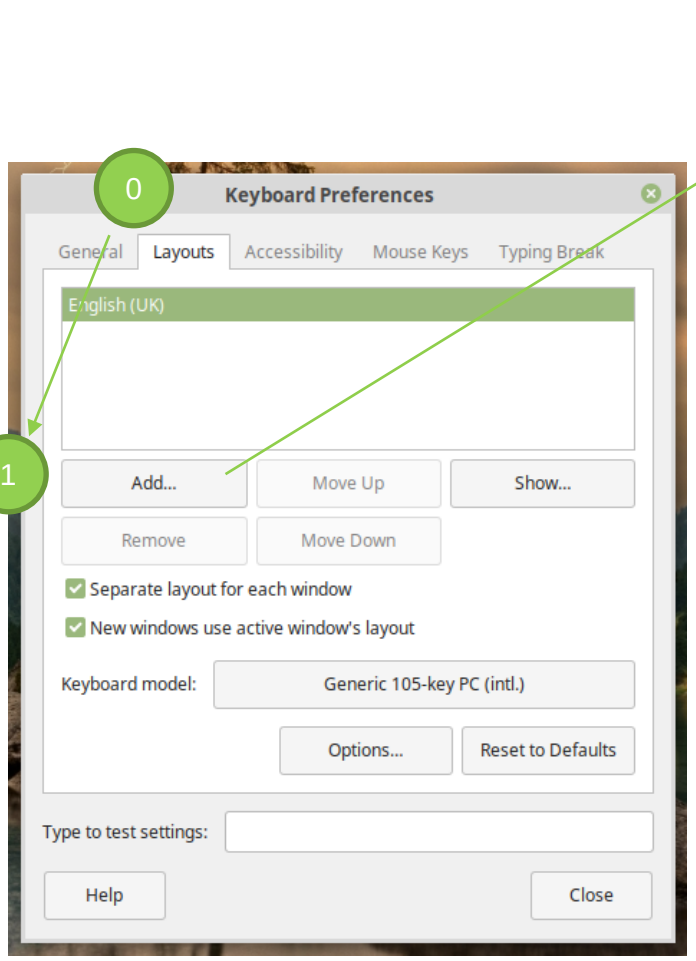
- The following slides show how to change the default keyboard maps within the Linux VMs for the:
  - **Embedded Linux Stream**
  - **Linux Security Stream**

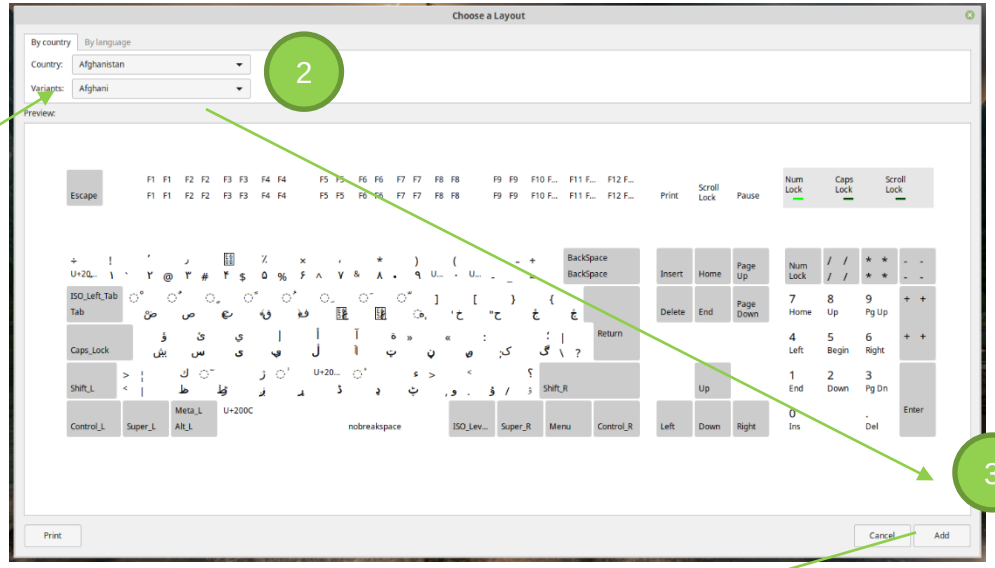
Linux Stream: Changing Keyboard Layout

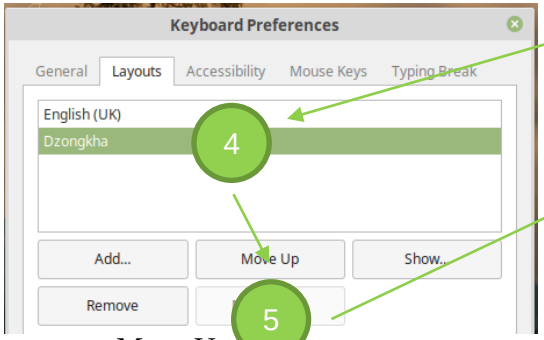
- To change the default keyboard maps within the Linux VM for the **Embedded Linux Stream**

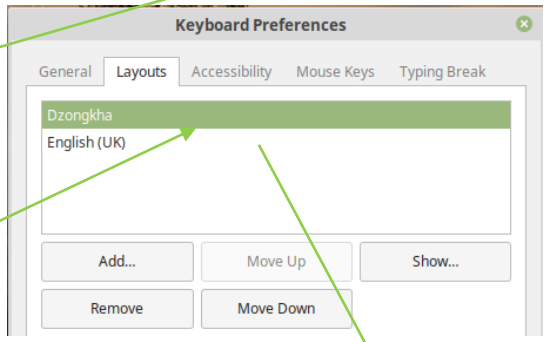


Linux Stream: Changing Keyboard Layout

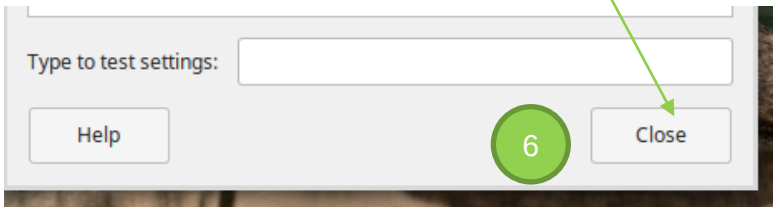






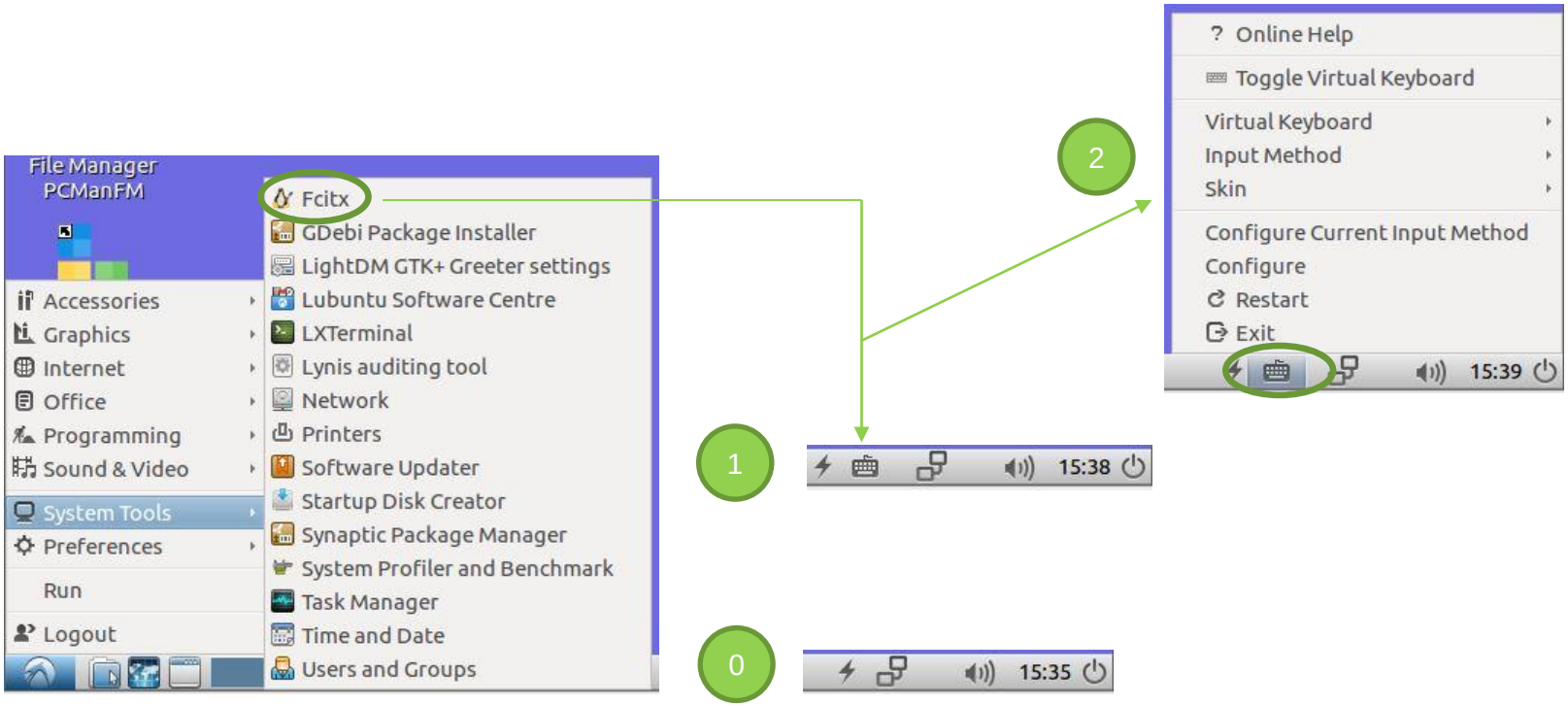


Move Up

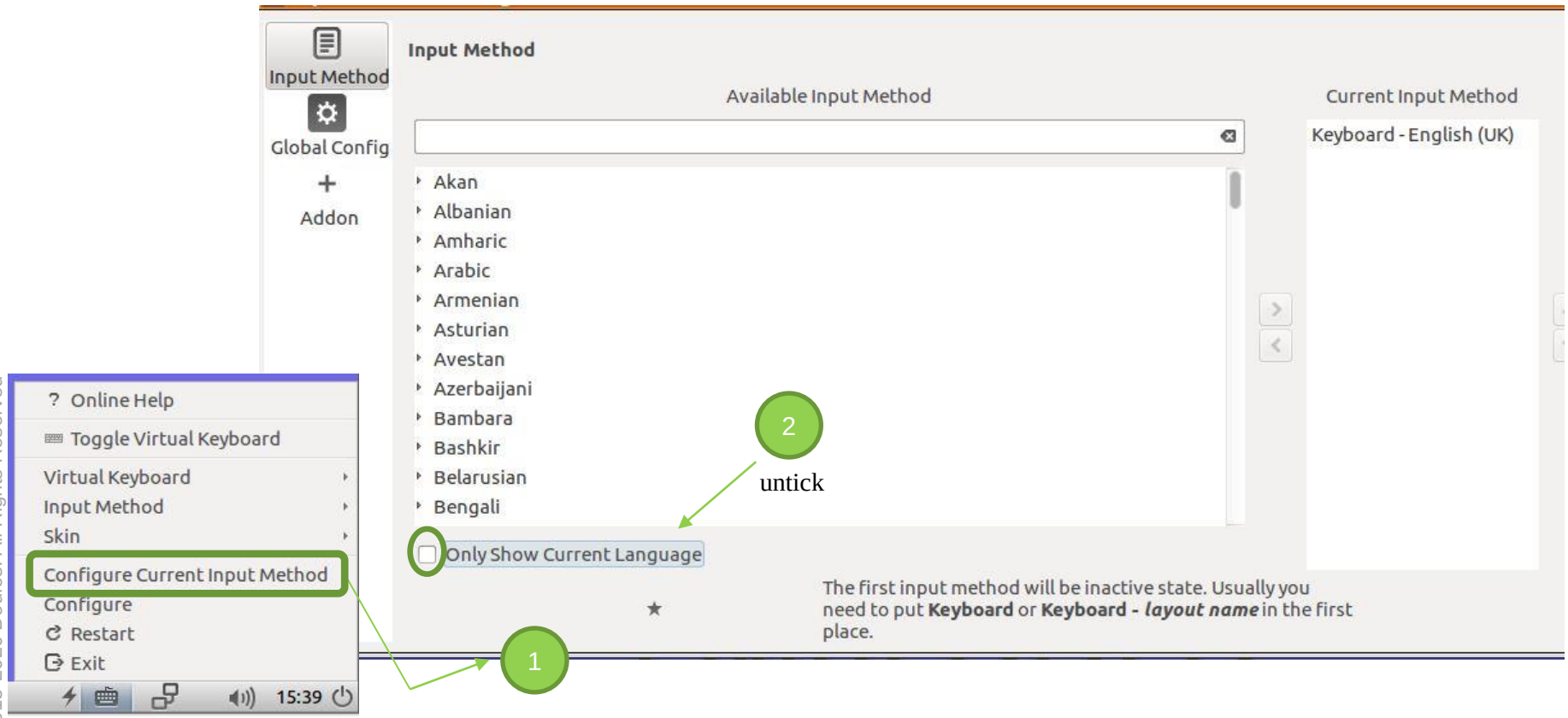


Security Stream: Changing Keyboard Layout

- To change the default keyboard maps within the Linux VMs for the **Linux Security Stream**



Security Stream: Changing Keyboard Layout



Security Stream: Changing Keyboard Layout