Chapter 3: Set up local HyperLedger V1 development environment

Learning Bluemix & Blockchain

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David Smits, Senior Certified Architect, IBM Blockchain

The Plan: 30 minute Chapters with an hour or two of practice

Chapter 1:	What is Blockchain? Concept and Architecture overview
Chapter 2:	What's the story we're going to build
Chapter 2.1:	Architecture for the Story
Chapter 3:	Set up local HyperLedger V1 development environment
Chapter 4:	Build and test the network
Chapter 5:	Administration User Experience
Chapter 6:	Buyer Support and User Experience
Chapter 7:	Seller Support and User Experience
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Setting up your development environment - all clients

- You will need Docker installed on your workstation to use the local development environment. To install Docker, please follow the instructions at the following links:
  - OSX: https://docs.docker.com/docker-for-mac/install/#download-docker-for-mac
  - Windows: https://docs.docker.com/docker-for-windows/install/
  - Ubuntu: https://docs.docker.com/engine/installation/linux/docker-ce/ubuntu/
  - Debian: https://docs.docker.com/engine/installation/linux/docker-ce/debian/
  - CentOS: https://docs.docker.com/engine/installation/linux/docker-ce/centos/
  - Fedora: https://docs.docker.com/engine/installation/linux/docker-ce/fedora/
- curl is used to manage the developer set up
  - it's installed as part of current releases of OS X
  - if you don't have it and are on a linux system, use your package manager to install it
    - for example: Ubuntu: **sudo apt-get install curl**
  - If you don't have it and are on Windows, use the following command to install it:
    - **yada yada yada**

Setting up your development environment: OS X

- Open a terminal window on your Mac and enter the following command:

```
curl -H 'Accept: application/vnd.github.v3.raw' https://raw.githubusercontent.com/rddill-IBM/ZeroToBlockchain/master/setup_OSX.sh | bash
```

  - This should be copied and pasted onto a single line in your terminal window. Press enter after copying
- This command will go through the following steps, informing you of each step in the process
  - Check for the presence of the Brew package manager and install it if it's missing. If it's present, execute the brew update and brew upgrade commands, install the dos2unix tool
  - Check for the presence of git and install it if it's missing
  - Install GitHub Desktop V 2.33
  - Check for the presence of nodeJS version 6 (Required for hyper ledger) and install it if it's missing
  - Install the nodejs SDK for hyper ledger composer
  - Install the hyper ledger fabric docker images
  - Install the fabric tools and update your .bash_profile
  - install hyper ledger composer platform-specific binaries
- If you don't want to automatically install and update all of these tools, then do the following instead:

```
curl -o setup_OSX.sh –H 'Accept: application/vnd.github.v3.raw' https://raw.githubusercontent.com/rddill-IBM/ZeroToBlockchain/master/setup_OSX.sh
```

  sudo chmod +x setup_OSX.sh

  ./setup_OSX.sh -h
- the -h option will list the commands you use to prevent selected installation actions from taking place, for example, to do everything except install git and nodeJS V6, you would type:

  ./setup_OSX.sh -g false -n false

Set up your development environment - Windows

- Microsoft Windows is not a natively supported operating system for HyperLedger Composer, as of September, 2017. To run this tutorial on your Windows (V7 or higher) operating system, we will install VirtualBox and then install Ubuntu 16.04 as your machine image. We will then use the Ubuntu installation exec to get everything onto your computer.

- Step 1: download a 64-bit Ubuntu 16.04 image
  - Go here: https://www.ubuntu.com/download
  - click on the Ubuntu Desktop option - this is a large download and will take 30+ minutes
- Step 2: download and install VirtualBox
  - Go here: https://www.virtualbox.org/wiki/Downloads
  - And click on Windows Hosts. This will start the download of the VirtualBox installer
- Step 3: Go to your downloads folder and run the VirtualBox …. .exe installer.
  - Take the defaults
- Step 4: Start Virtual Box
  - Click on the "new" icon
  - Take all the defaults EXCEPT memory.
  - Give your virtual machine at least 2Gb rather than the 1Gb default
- Step 5: Start your new virtual machine
  - Give it the ISO file you downloaded in step 1
- Step 6: After the machine starts, select the "Install Ubuntu Desktop" option
  - Select options to update the installation and to install 3rd party code

- Step 7: Follow the steps for an Ubuntu installation on the following pages.

Setting up your development environment: Linux: Ubuntu

- Open a terminal window on your Ubuntu Linux and enter the following command:
  - `sudo apt-get install -y curl`
- After curl has been installed, copy the following as a single line into a terminal window and press enter

  ```
  curl -H 'Accept: application/vnd.github.v3.raw' https://raw.githubusercontent.com/rddill-IBM/ZeroToBlockchain/master/setup_Ubuntu_Part_1.sh | bash
  ```

  - This should be copied and pasted onto a single line in your terminal window. Press enter after copying
- This will install all required software up through docker.
- You will then need to reboot your system prior to executing the following command:

  ```
  curl -H 'Accept: application/vnd.github.v3.raw' https://raw.githubusercontent.com/rddill-IBM/ZeroToBlockchain/master/setup_Ubuntu_Part_2.sh | bash
  ```

  - This will complete the installation of the hyper ledger images and the supporting tools.
- This command will go through the following steps, informing you of each step in the process
  - Update the apt-get repositories and upgrade current software
  - Ensure that the base development environment is installed
  - Check for the presence of git and install it if it's missing
  - Check for the presence of nodeJS version 6 (Required for hyper ledger) and install it if it's missing
  - Install the nodejs SDK for hyper ledger composer
  - Install the VSCode editor
  - Install the hyper ledger fabric docker images
  - Install the fabric tools and update your .bash_profile
  - install hyper ledger composer platform-specific binaries

Setting up your development environment: Linux: Ubuntu (Optional)

- If you don't want to automatically install and update all of the tools, then execute the following three commands, instead:

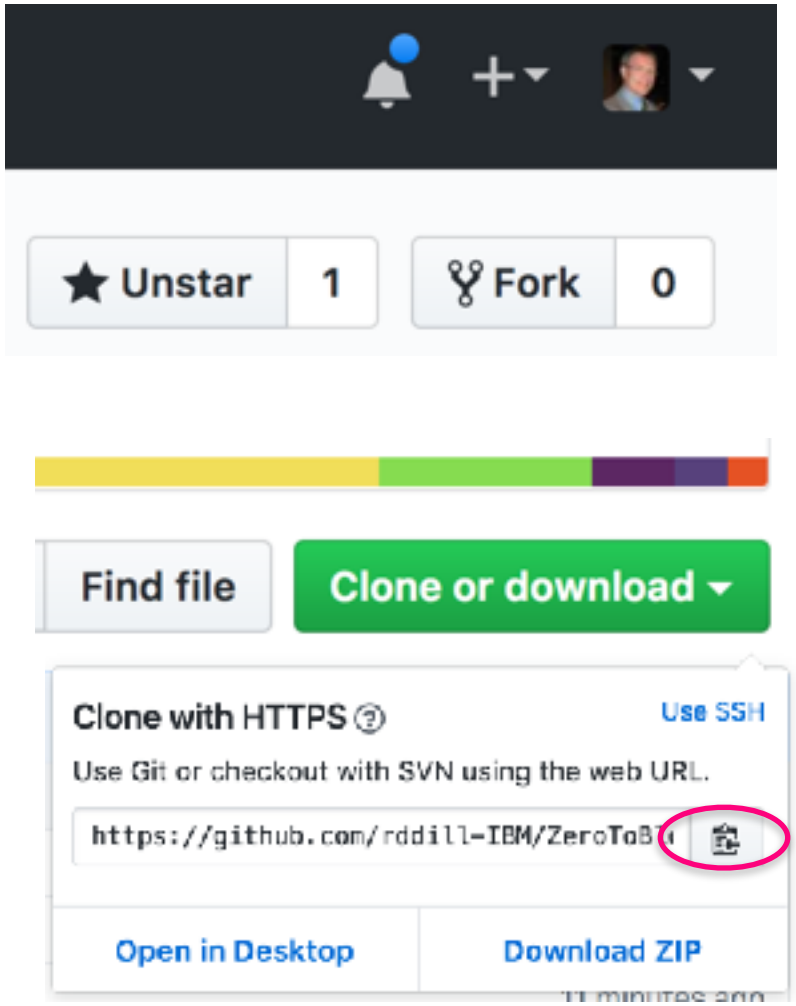
```
curl -H 'Content:application/vnd.github.v3.raw' https://
raw.githubusercontent.com/rddill-IBM/ZeroToBlockchain/master/
setup_Ubuntu_Part_1.sh >> setup_Ubuntu_Part_1.sh

sudo chmod +x setup_Ubuntu_Part_1.sh

./setup_Ubuntu_Part_1.sh -h
```

- the -h option will list the commands you use to prevent selected installation actions from taking place, for example, to do everything except install git and nodeJS V6, you would type:

```
./setup_Ubuntu_Part_1.sh -g false -n false
```


Setting up your development environment: Get the Tutorial

- The repository for this tutorial is located here:
  - https://github.com/rddill-IBM/ZeroToBlockchain
  - If you don't yet have a user-id and password for github, go to this link and sign up: https://github.com
- Go to the Zero To Blockchain repository and select "fork"; you'll see it in the top right hand corner of the browser page
- This will create a copy of this repository under your own id.
- Click clone on your version of the repository. It is a (green) button on the right hand side of the browser page
  - When you click the button, it will ask you if you want to copy the link or use github desktop to clone the repository to your computer.
  - If you don't have github desktop, then click on the copy button and
    - open a terminal window on your computer
    - change to the folder where you (want to) store your git repositories (for example: Documents/GitHub)
    - type **`git clone <paste in the url you copied in the previous step>`**
    - and then press enter.
- Verify your installation.
  - change to the **Chapter03** folder inside your just cloned repository
    - for example, by typing: `cd documents/github/zerotoblockchain/chapter03`
  - Execute the following commands
    - `npm install`
    - `./buildAndDeploy.sh`



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Chapter 4: Build and Test the Network

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Appendix A: Windows Setup Details

Windows Set up

- Step 1: download a 64-bit Ubuntu 16.04 image
  - Go here: https://www.ubuntu.com/download
  - click on the Ubuntu Desktop option - this is a large download and will take 30+ minutes
- Step 2: download and install VirtualBox
  - Go here: https://www.virtualbox.org/wiki/Downloads
  - And click on Windows Hosts. This will start the download of the VirtualBox installer
- Step 3: Go to your downloads folder and run the VirtualBox …. .exe installer.
  - Take the defaults
- Step 4: Start Virtual Box
  - Click on the "new" icon
  - Take all the defaults EXCEPT memory.
  - Give your virtual machine at least 2Gb rather than the 1Gb default
- Step 5: Start your new virtual machine
  - Give it the ISO file you downloaded in step 1
- Step 6: After the machine starts, select the "Install Ubuntu Desktop" option
  - Select options to update the installation and to install 3rd party code

- Step 7: Follow the steps for an Ubuntu installation on the following pages.

Windows Set up

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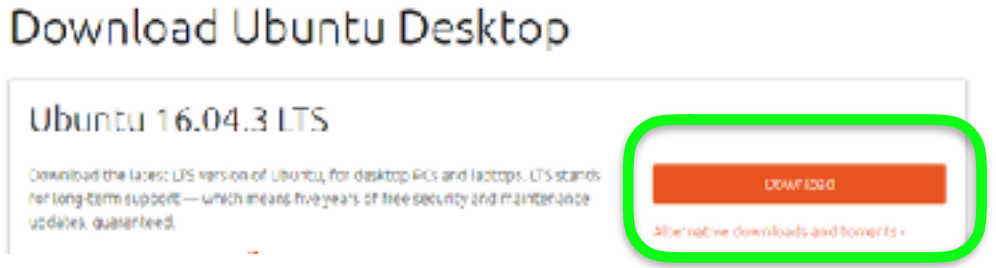

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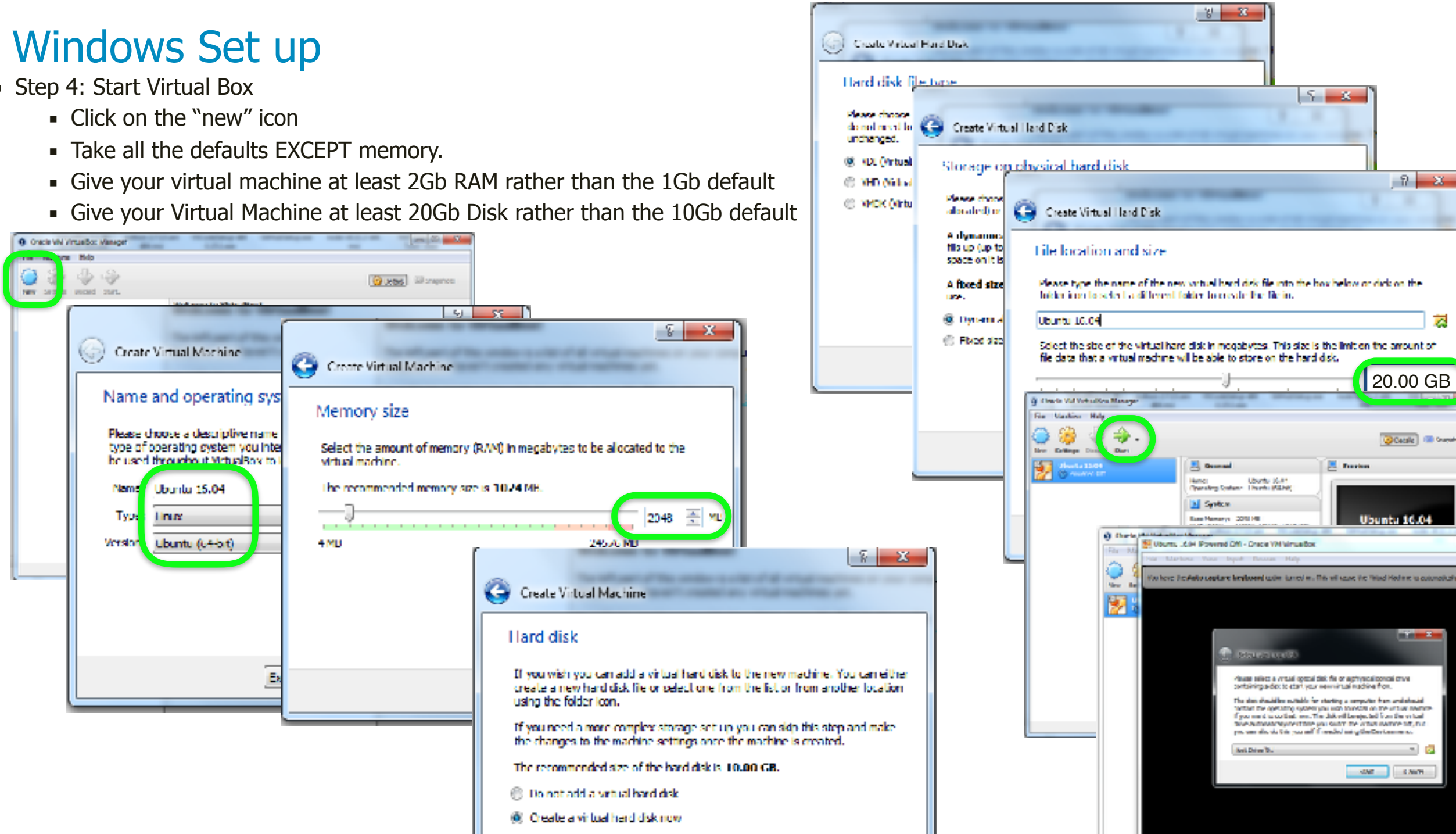
- Step 2: download and install VirtualBox
  - Go here: https://www.virtualbox.org/wiki/Downloads
  - And click on Windows Hosts. This will start the download of the VirtualBox installer

Installing Virtual Box

- Click New and, mostly, take the defaults

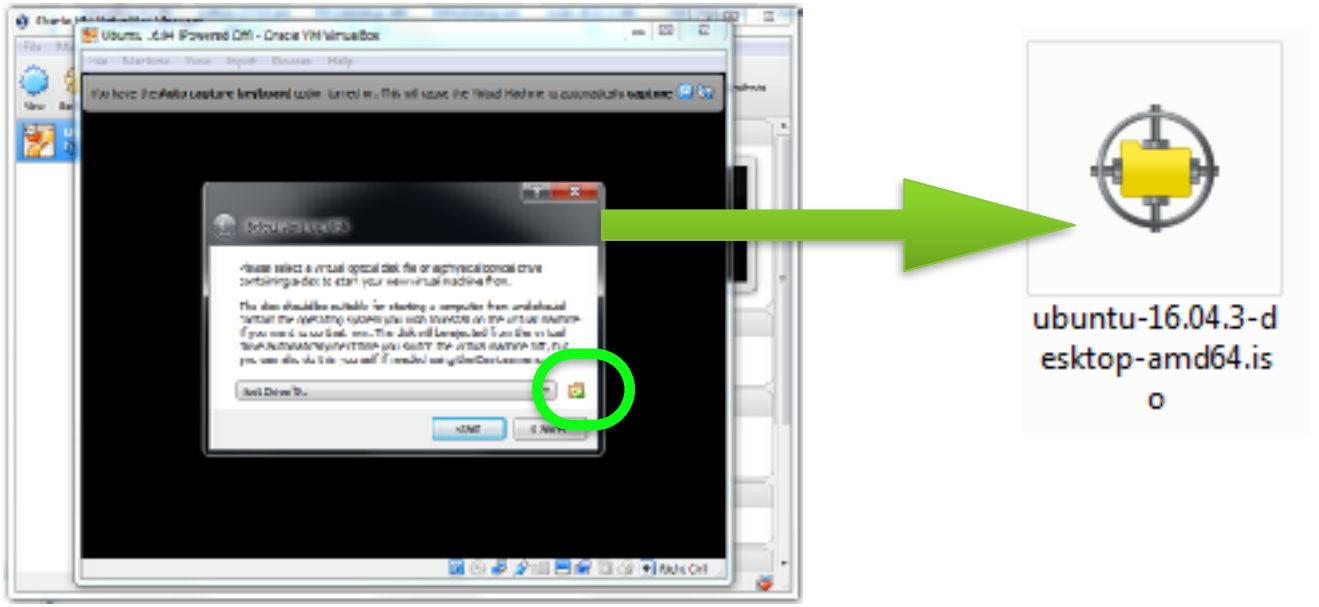
Windows Set up

- Step 4: Start Virtual Box
  - Click on the "new" icon
  - Take all the defaults EXCEPT memory.
  - Give your virtual machine at least 2Gb RAM rather than the 1Gb default
  - Give your Virtual Machine at least 20Gb Disk rather than the 10Gb default

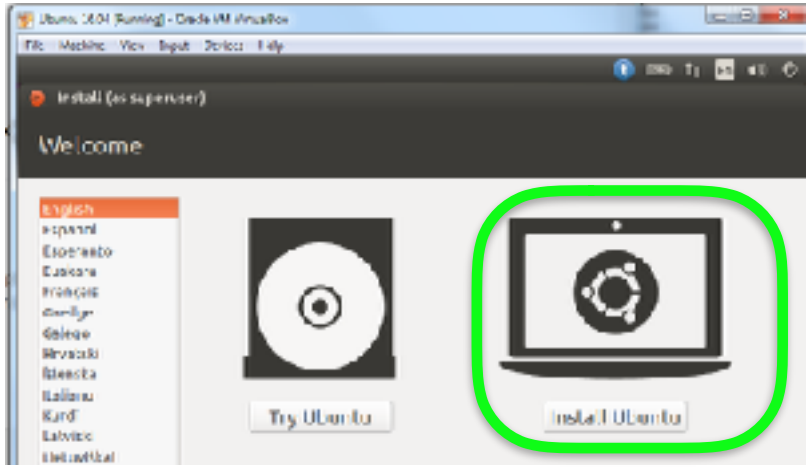


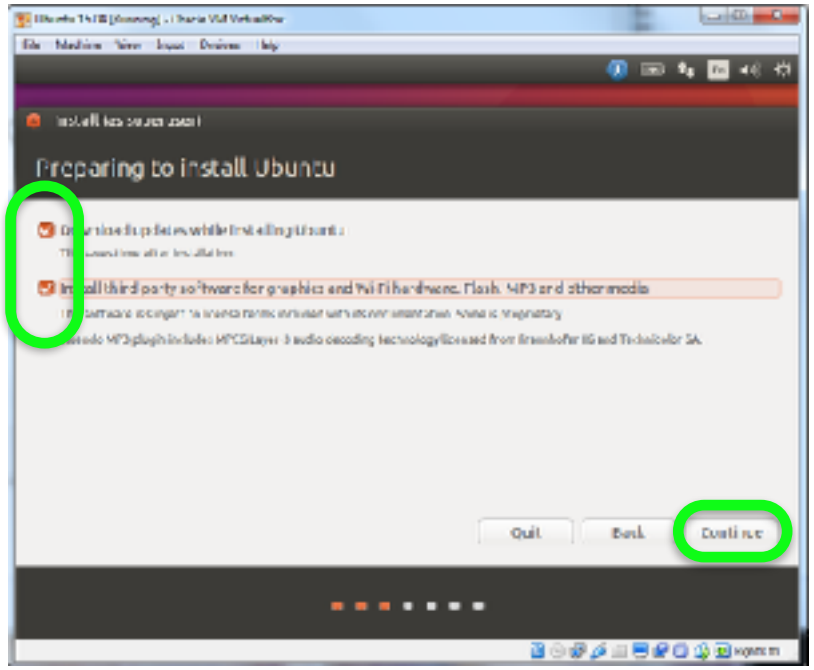
Windows Set up

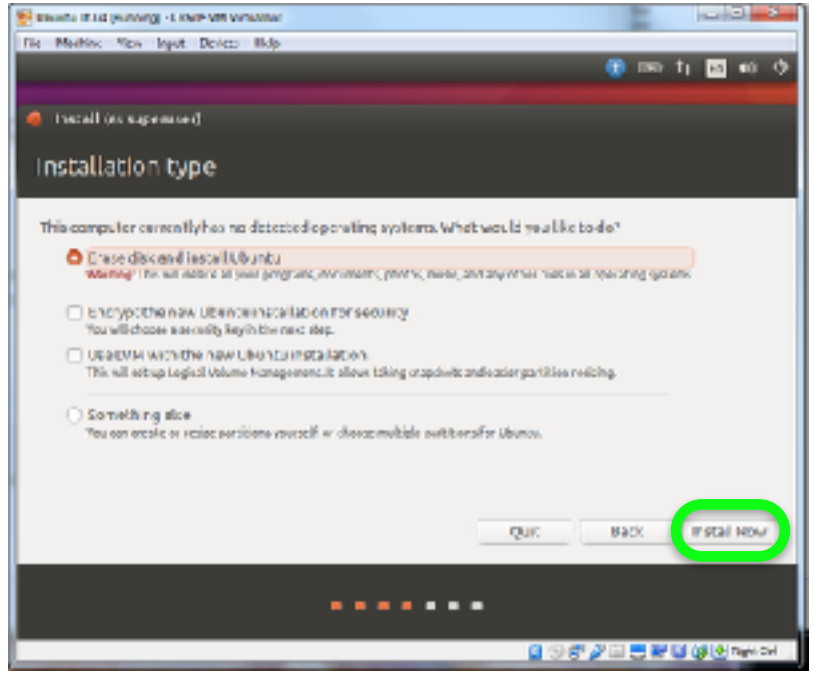
- Step 5: Start your new virtual machine
  - Give it the ISO file you downloaded in step 1



Windows Set up







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