ISERink Mentor Training Activity

Overview

This activity will provide an introduction to the ISERink environment by walking through the installation of Debian 8 (Jessie) and the installation and testing of the Apache web server. This walkthrough will highlight the features and available functionality, as well as some gotchas, of the ISERink environment.

Agenda

- Overview of the ISERink ISO Grabber
- Accessing VCenter
- Creating a Virtual Machine
- Install Debian on the Virtual Machine
- ISERink RDP: PuTTY and Web Browser

Overview of the ISERink ISO Grabber

Virtual machines, like any other system, must have an operating system installed. Like with many other systems, the simplest way to install an OS is by booting a live CD. The ISERink provides an ISO grabber at http://iserink-iso.iseage.org. Search through the list and locate the debian-8.3.0-amd64-DVD-1.iso file. This is the CD image we will use to install Debian Jessie on a virtual machine.

If you wish to use an OS that is not provided, you can paste the URL into the grabber to have it imported into the ISERink environment. The ISO grabber webpage also contains information for Windows license keys.

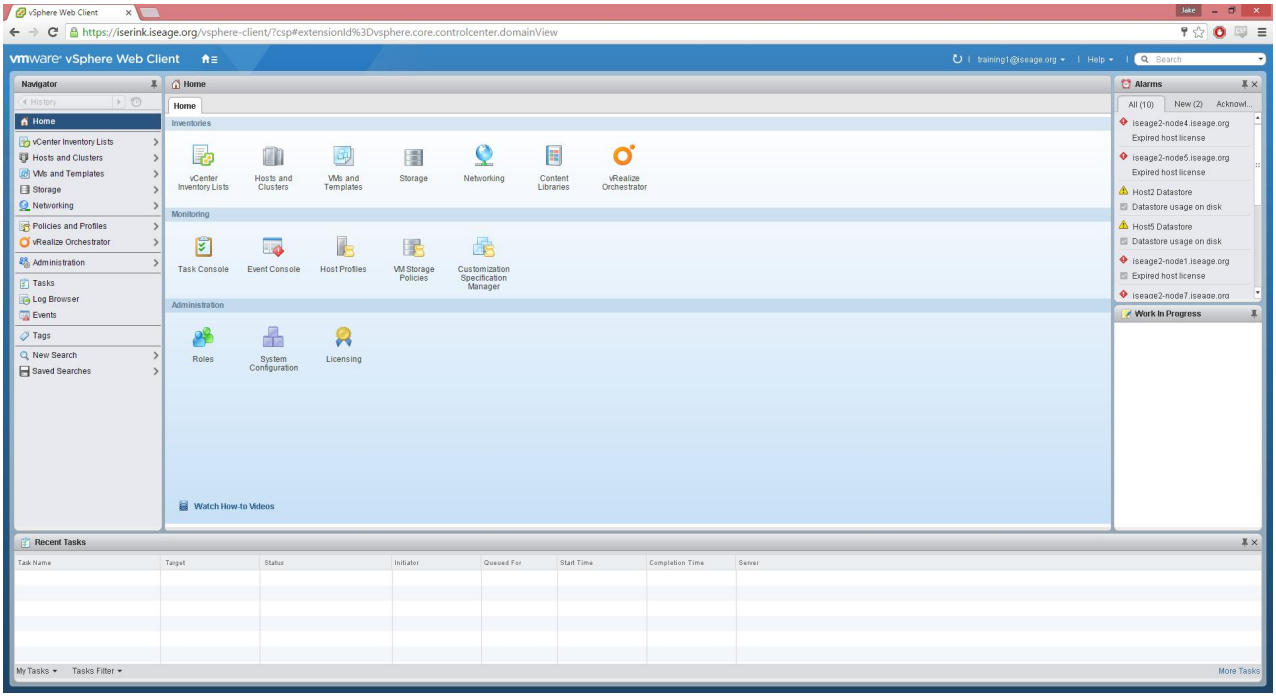
Accessing VCenter

There are three options for accessing VCenter: the VCenter web client, the VMWare VSphere Windows client ("thick client") on a local machine, and the thick client via the iserink-rdp server. The screenshots in this walkthrough were taken with the web client. The thick client interface is slightly different, but it is an easy transition. If you encounter any issues with VCenter, it may help to try switching to a different client.

For the training exercise, please select one of the methods to access VCenter and log in.

Accessing the web client

Access the web client by visiting http://iserink.iseage.org. Select "Log in to VSphere Web Client." Log in with your domain username and password. The welcome screen is shown below.



Installing the thick client

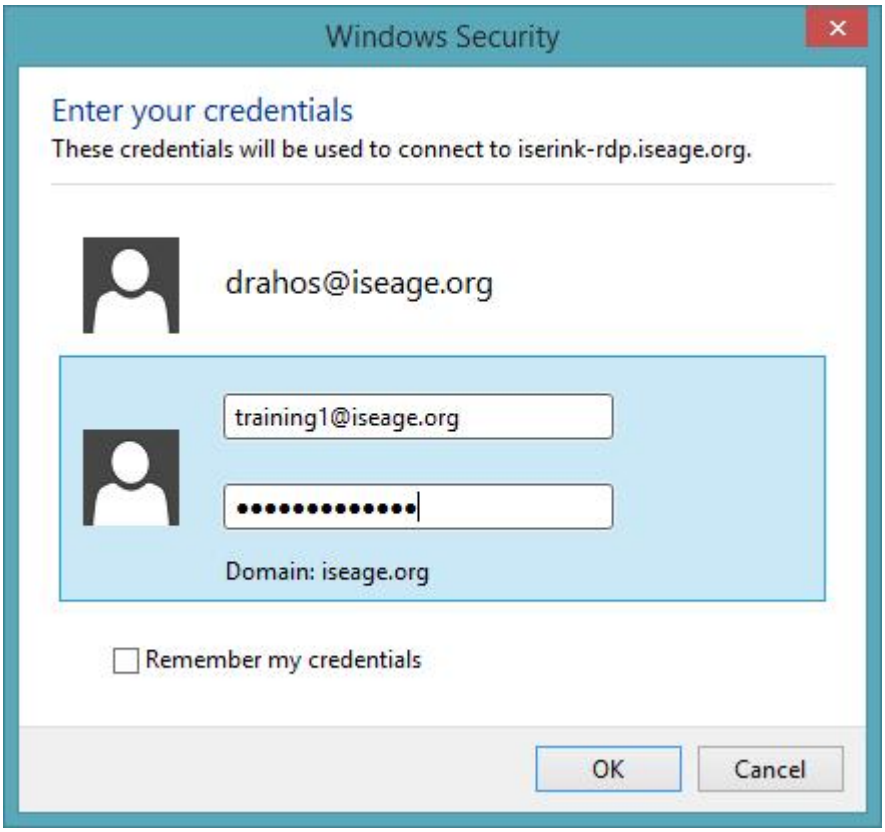
The thick client is only supported on windows. The installer can be downloaded from http://vsphereclient.vmware.com/vsphereclient/VMware-viclient-all-6.0.0.exe. When connecting with the thick client (from a local machine or from the RDP server), use iserink.iseage.org as the server name and your domain credentials.

Connecting to iserink-rdp (and using the thick client)

The ISERink RDP server is primarily used for testing, but it can be used to access the VSphere thick client as well. This is a good option if you have no support for Flash on a local machine and no way to install the thick client (or the OS is not Windows).

To access iserink-rdp, start a Remote Desktop (RDP) client. The Windows RDP client is shown. Enter iserink-rdp.iseage.org as the computer, and click connect.

Select “Other account” if necessary, and enter your domain credentials. @iseage.org must be appended to the username.

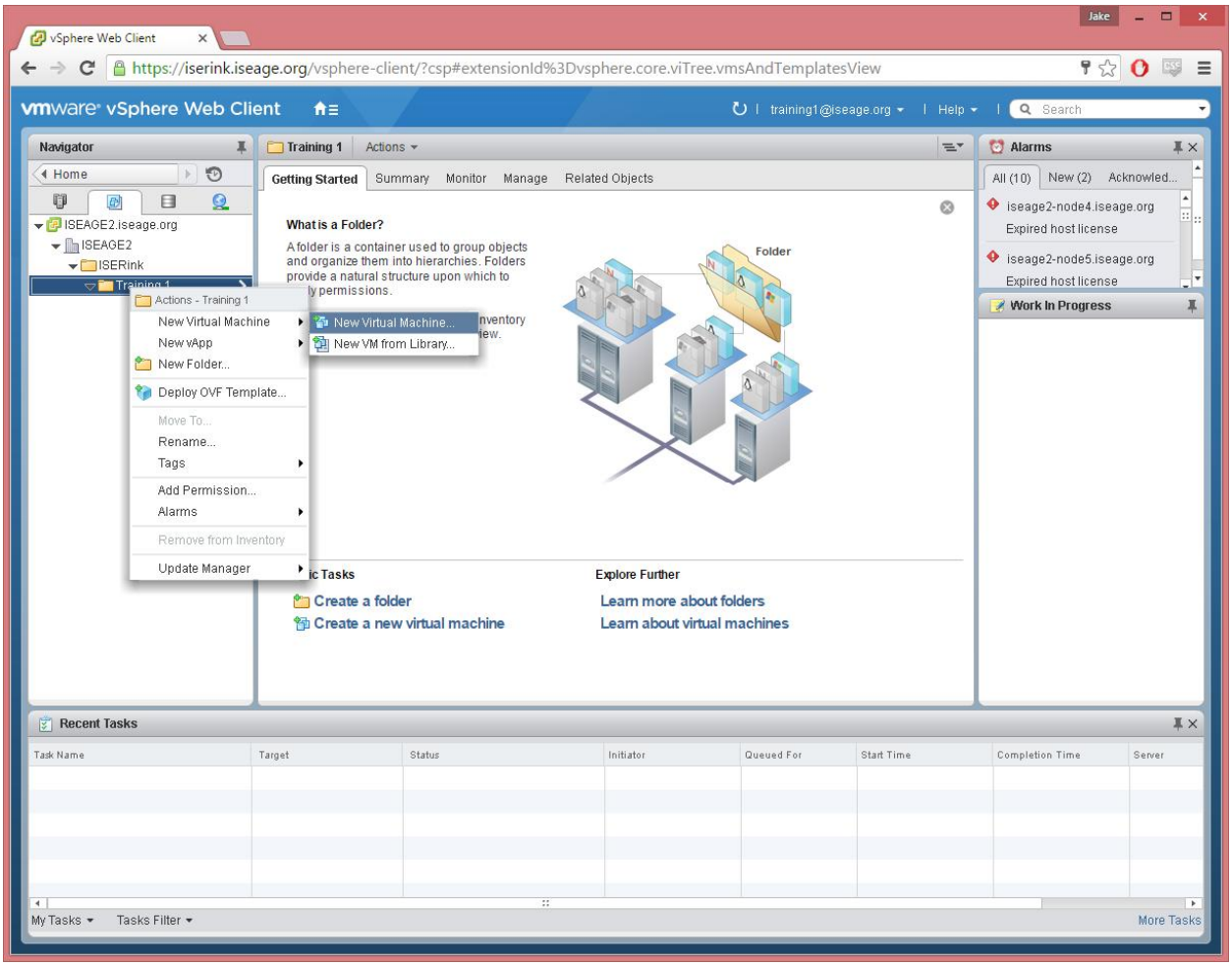


This will create a virtual desktop. The thick client is available on this server from the desktop icon “VMWare VSphere Client”. As mentioned before, the interface is similar, yet slightly different.

Creating a Virtual Machine

This next section will walk you through creating a virtual machine. This allocates resources for the machine and determines which network(s) it will be attached to. **This step does not install an operating system on the virtual machine.**

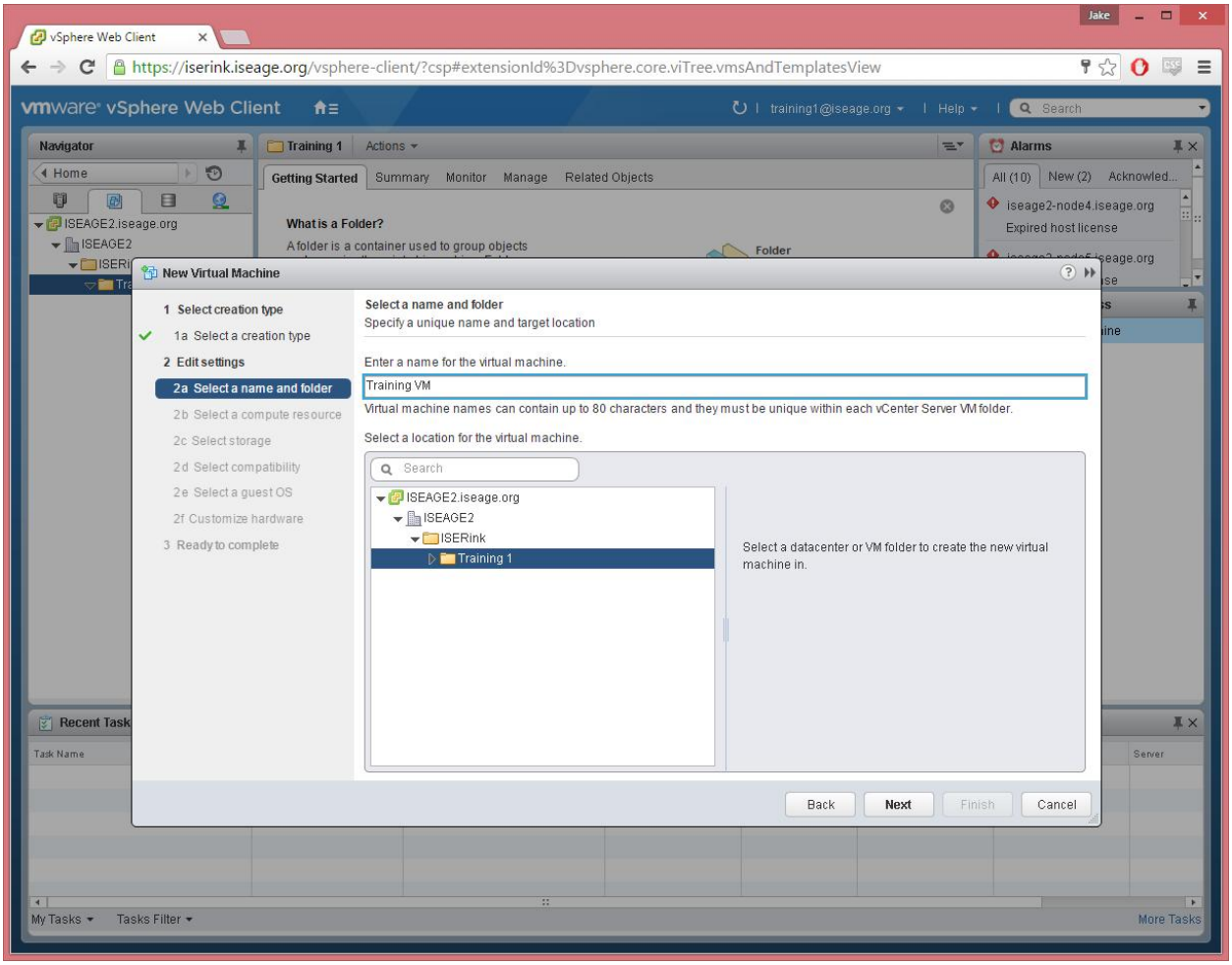
First, select the “VMs and Templates” view in the column to the left. Expand the tree view to reach your folder. Each user will have a single folder assigned that is used to hold virtual machines. Right-click on the folder and select “New Virtual Machine…”



Accessing the “New Virtual Machine” wizard.

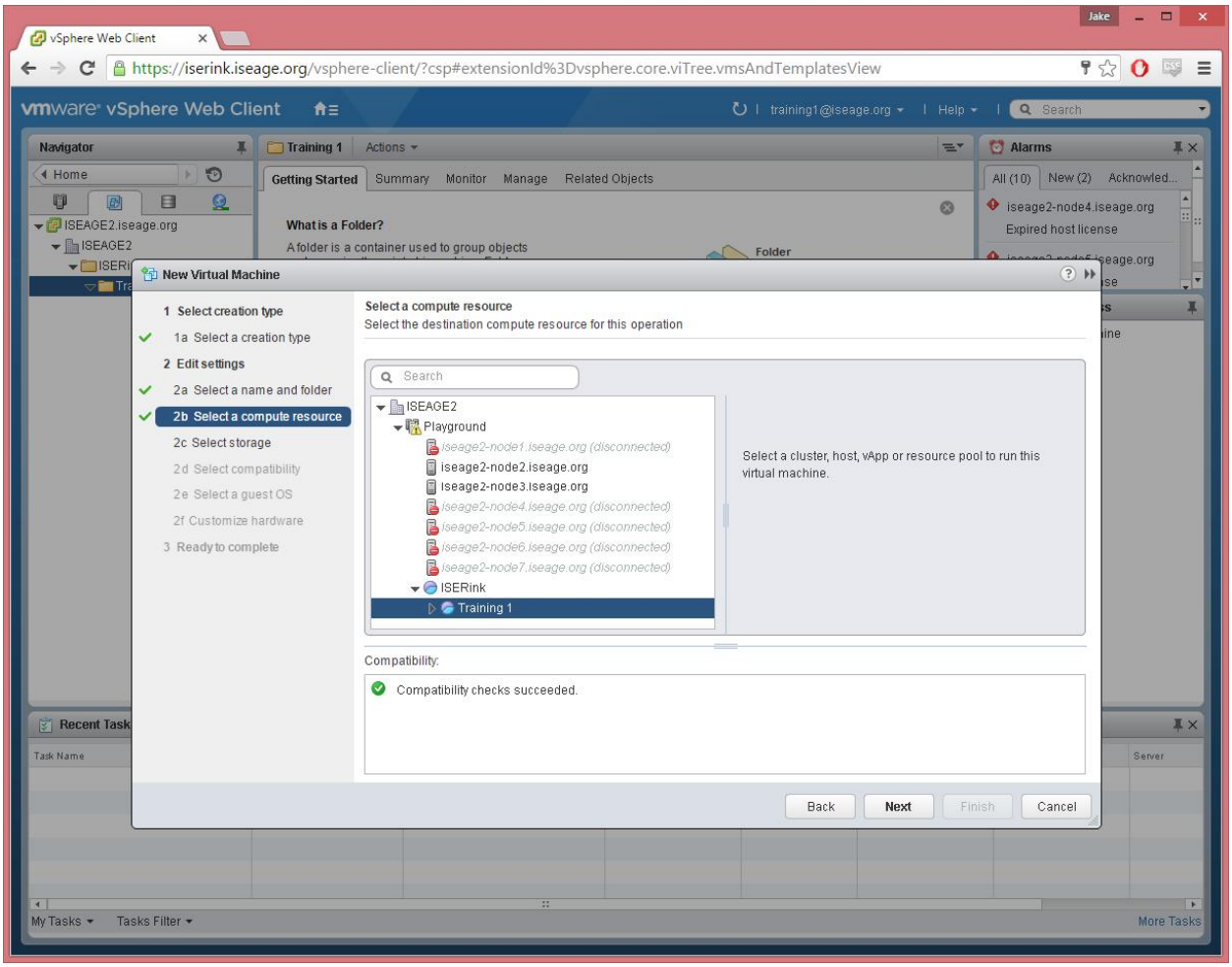
On the first page of the wizard, simple press “Next” to create a new virtual machine. Other options can be used to manipulate virtual machine templates, which is outside the scope of this

activity. Assign the VM an appropriate name, and place it in your folder.



Name and location of VM.

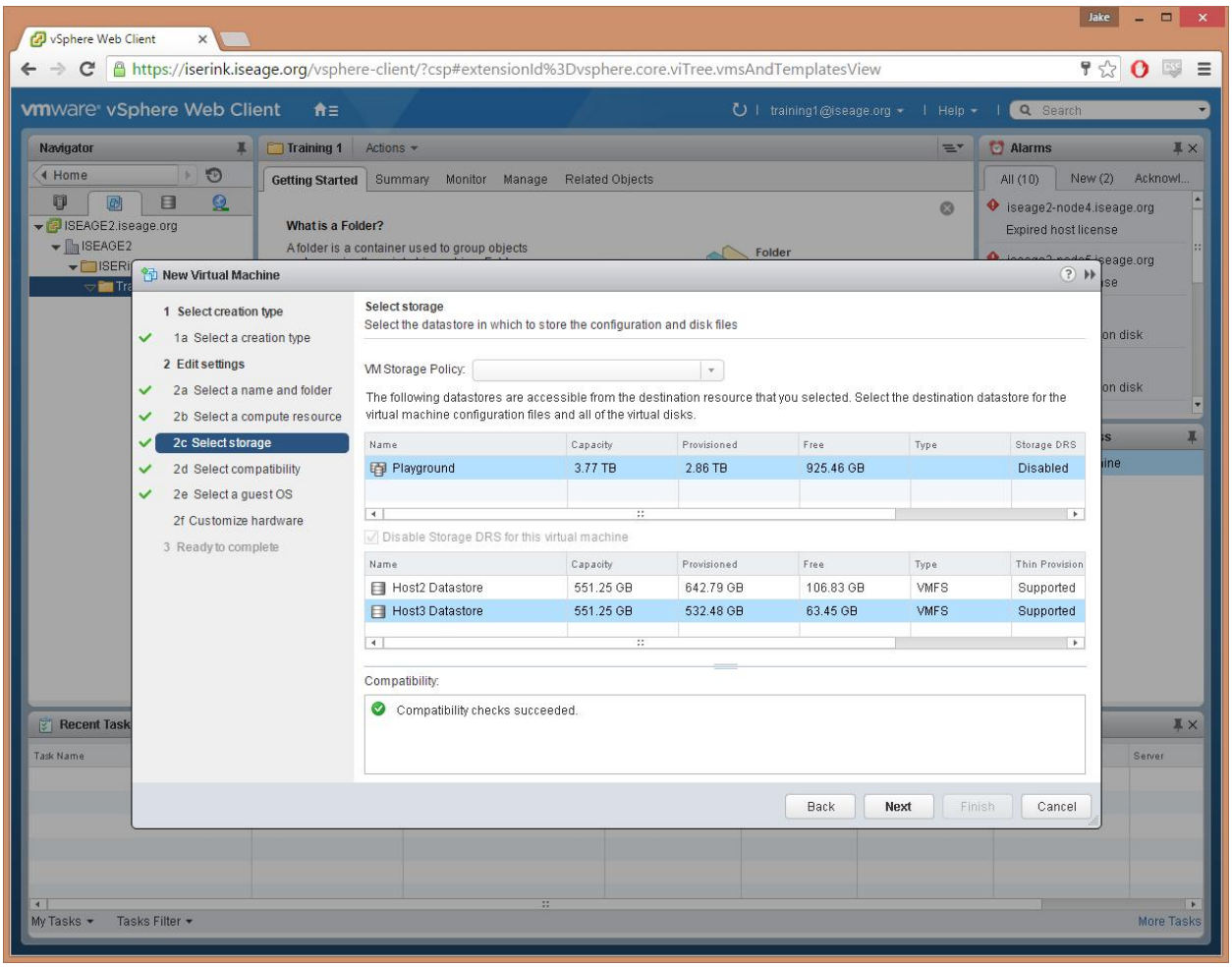
The next step is to select a “Compute Resource” for your virtual machine. Expand the tree view and select your resource pool, then press Next.



Selecting a compute resource.

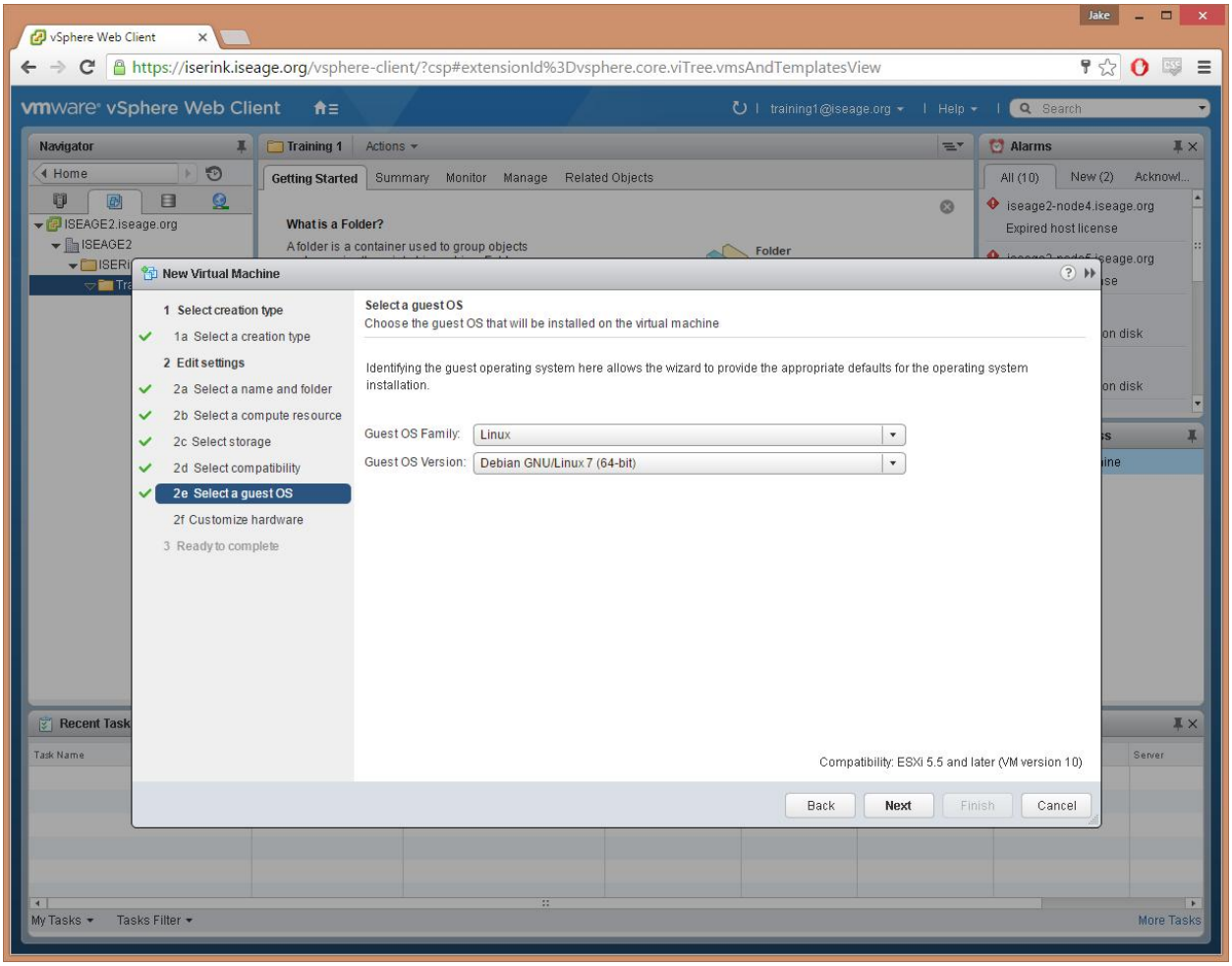
On the next screen, use the lower pane to select a storage location. The exact host does not matter, but you may find it preferable to keep all related VMs on a single host in more complex

virtual environments.



Selecting storage location.

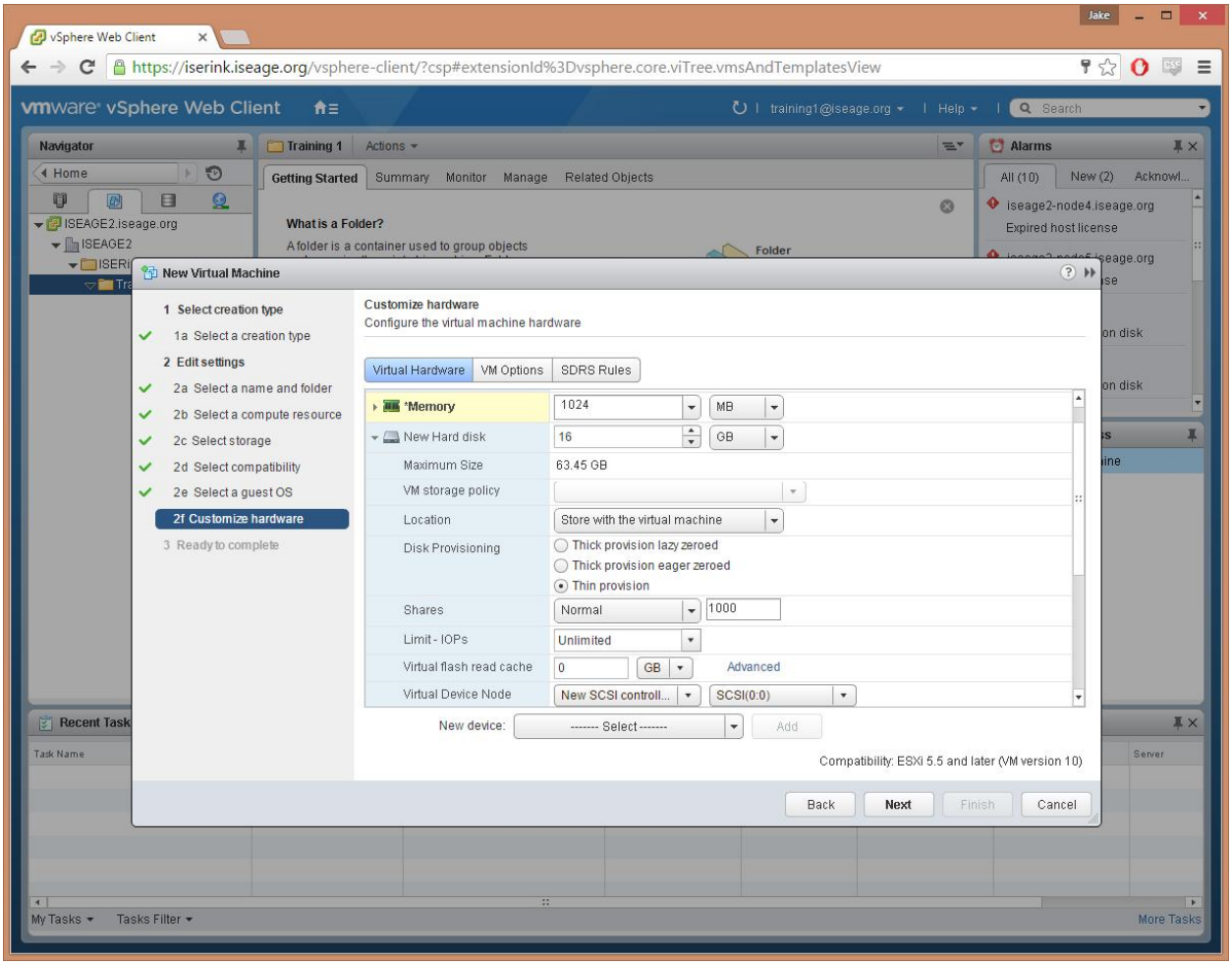
Simply press Next (“Compatible with ESXi 5.5 and later”) in step 2d and proceed to “Select a guest OS”. On this page, select Linux for the family and Debian GNU/Linux 7 (64-bit) as the OS version. **This page is almost entirely meaningless, and does not install a guest OS.**



This is not important.

In Step 2f, you will select the hardware configuration of your virtual machine. There are several critically important steps to perform. Be conservative with your RAM usage: 1024 MB is more than sufficient for a non-GUI Linux virtual machine. **Expand the “New hard disk” tree and select the “Thin provision” radio button. This is critical to permit scalable operation of**

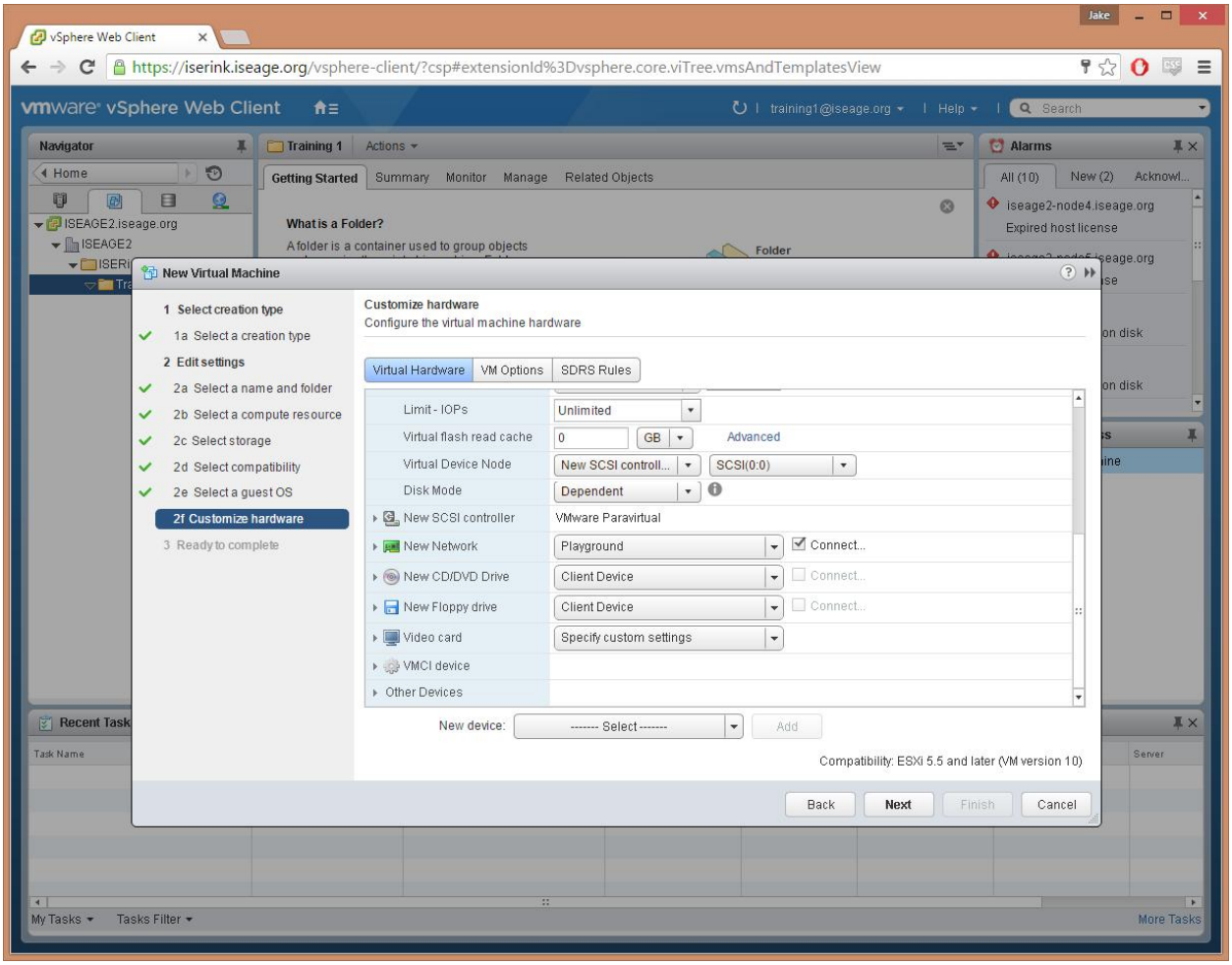
the ISERink cluster. 16 GB is typical for a Linux server. More is required for Windows.



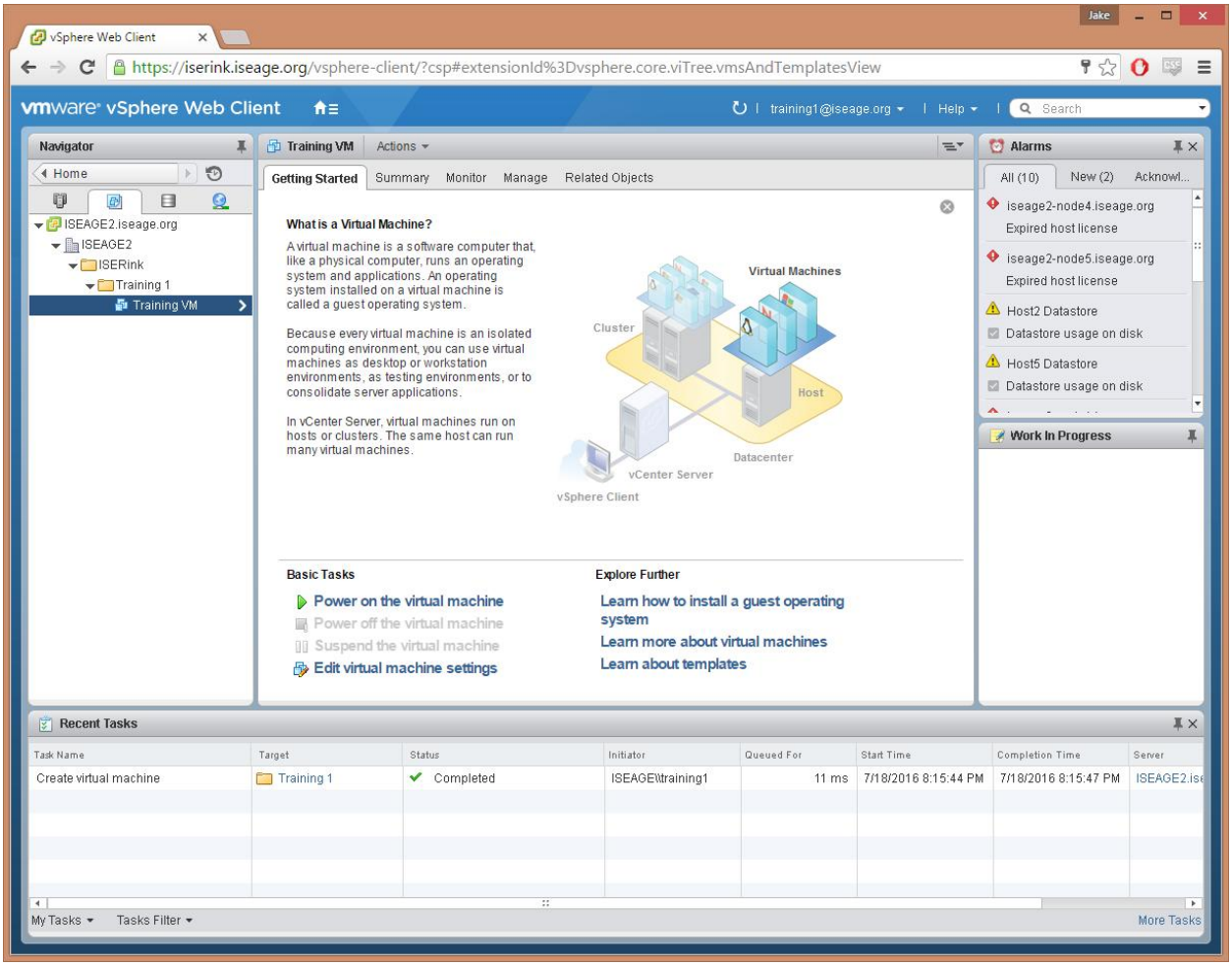
RAM and hard disk.

Scroll down and verify that the “New Network” has the “Playground” network selected. This virtual network represents the ISERink simulated internet. Also ensure that the “Connect…” box

is selected. Press Next to continue, and then Finish to create the virtual machine.



Verify network configuration.

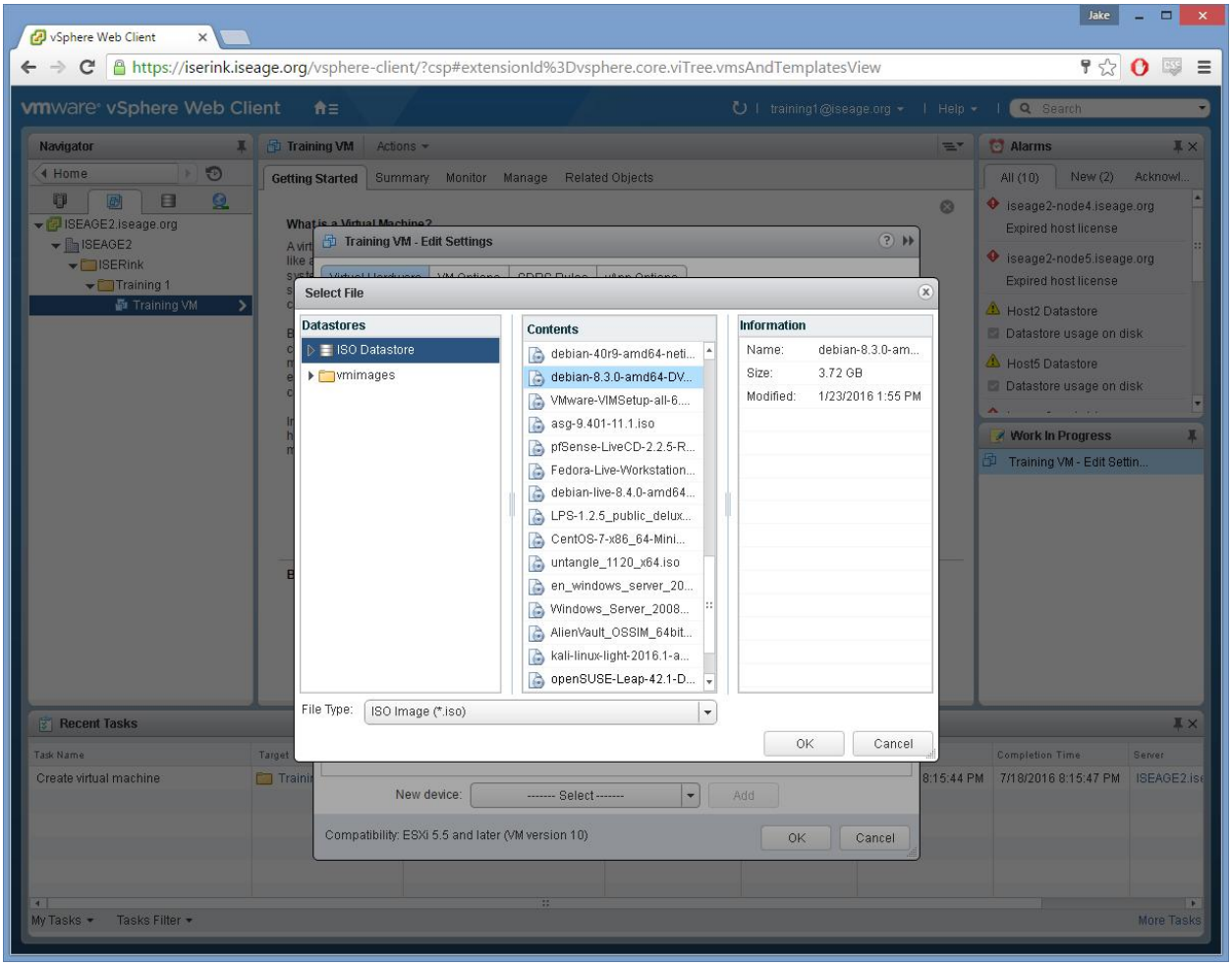


Your VM will appear following a brief delay.

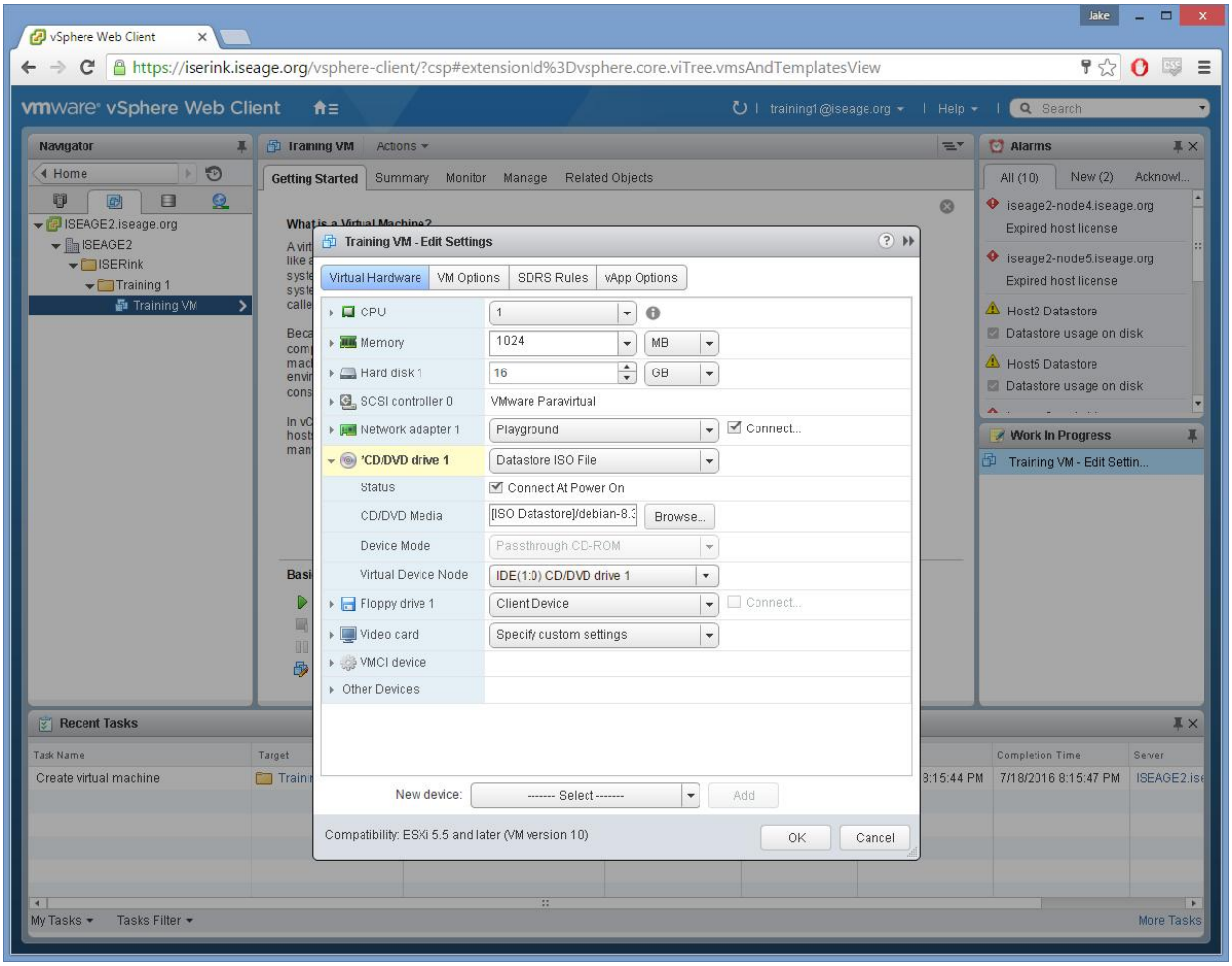
Installing Debian on the new VM

This process is, for the most part, identical to installing Debian Linux on a physical machine. The ISO must first be “put” into the drive, and then the installation will proceed as normal.

First, select “Edit virtual machine settings” from the VM “Getting Started” tab or right-click the VM and select “Edit settings”. In this window, you can edit any of the virtual hardware settings. Expand the CD/DVD drive 1 dropdown and select “Datastore ISO file”. Then, select “Browse”. Select the ISO Datastore, then scroll through the “Contents” pane and select the “debian-8.3.0-amd64-DVD-1.iso” file. After selecting the ISO, ensure the “Connect at power on” box is checked. Press “Ok” to save the settings.

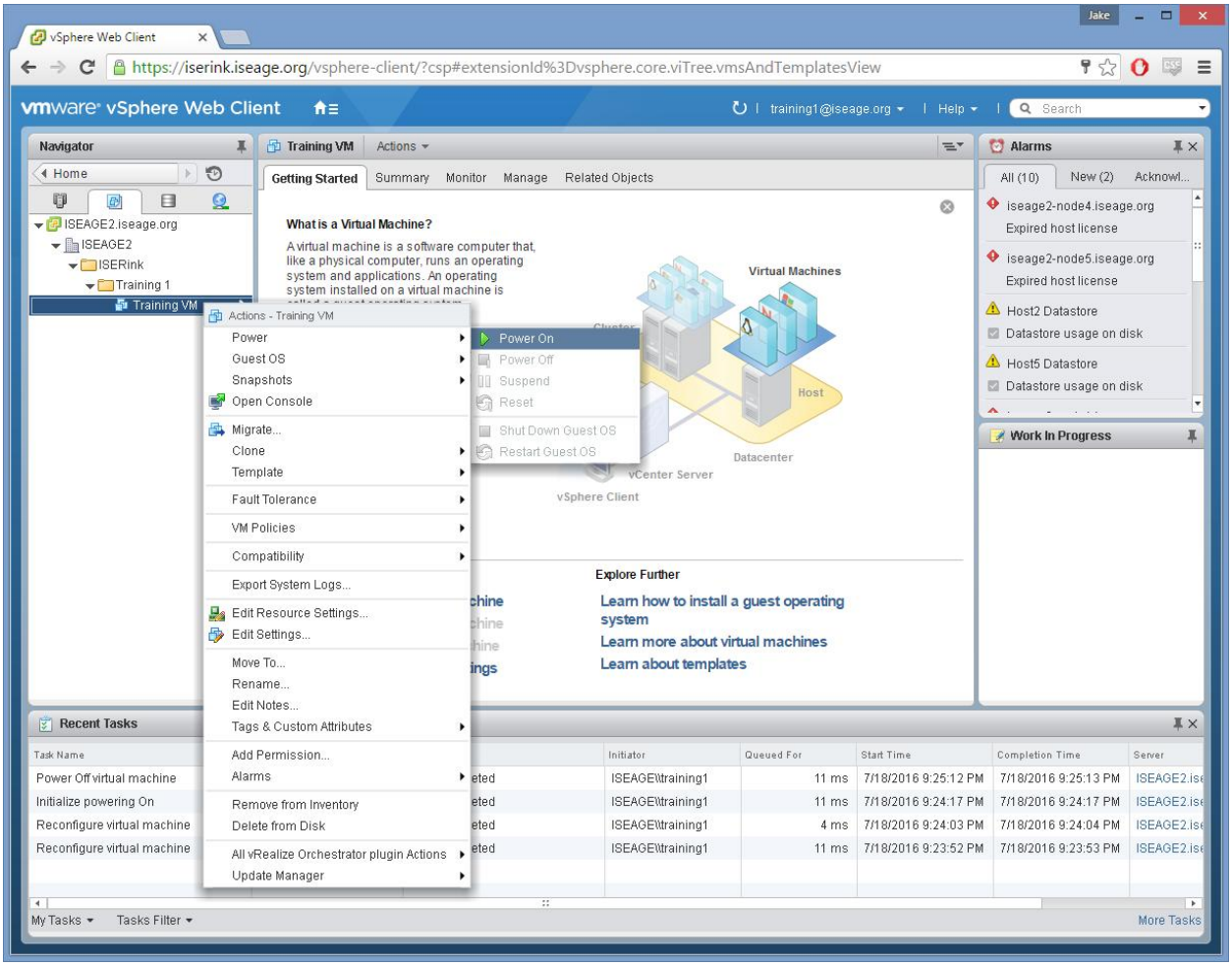


Browsing the datastore.



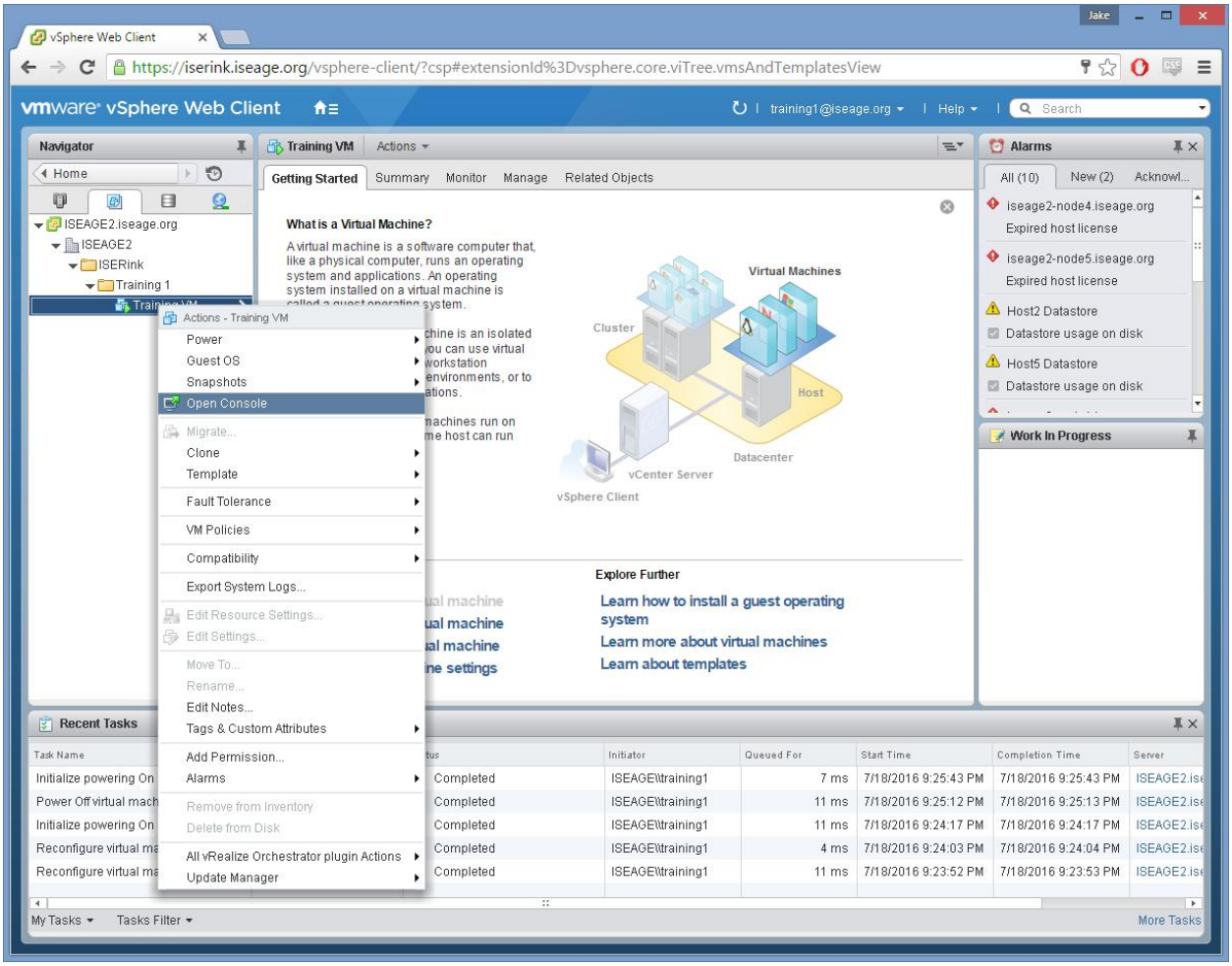
ISO selected and connected at power on.

Once the ISO is added, there will be a brief delay before the settings update. Once the screen refreshes, press “Power on the virtual machine” on the “Getting Started” tab, or right-click the VM and select “Power->Power On”.



Powering on the VM.

Once you have selected “Power On”, right-click the VM and choose “Open Console”.

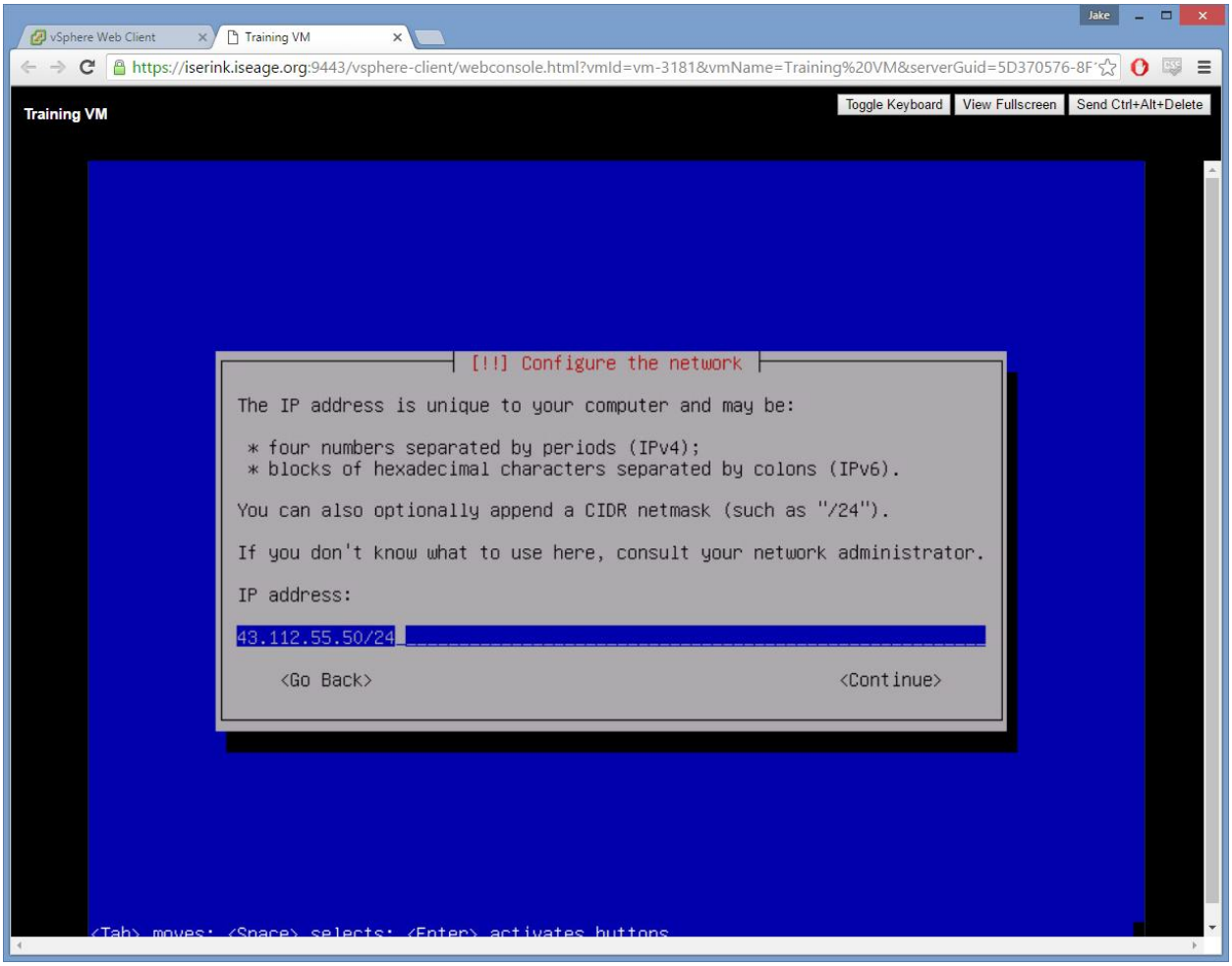


Opening the virtual console.

The virtual console.

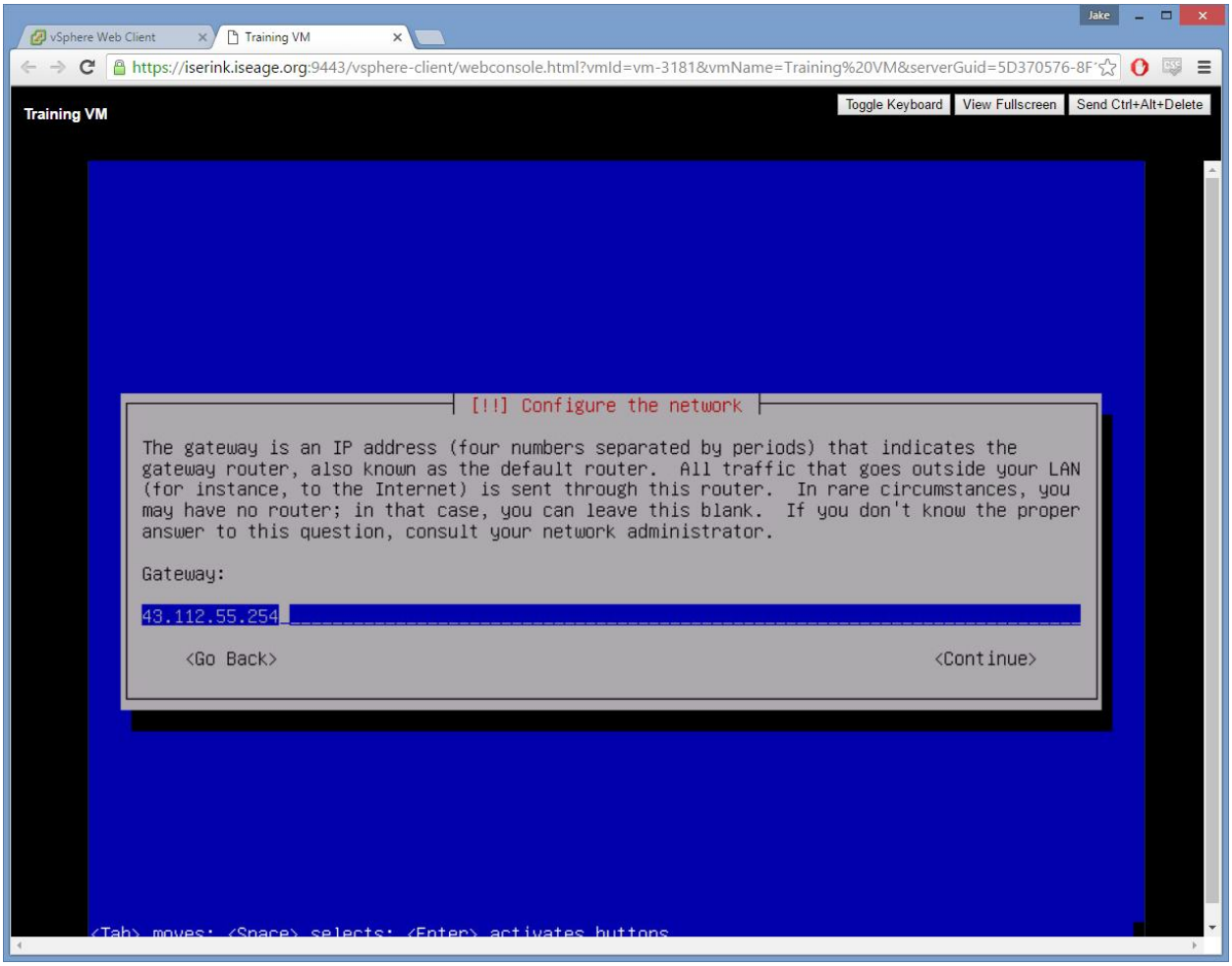
For the sake of brevity, most of the Debian installation options will not be shown. Only those with notable non-default options will be displayed.

Proceed through the Debian setup with default options until it notifies you that network autoconfiguration has failed. Select “<Continue>”, then “Configure network manually”. You will arrive at a screen for entering the IP address. Consult the table at the beginning of this document for your IP address range. Select an fourth octet within your IP address range to use (the final octet of 254 is reserved). 43.112.55.50/24 is used in this example, within the 43.112.55.0/24 range assigned to training1.



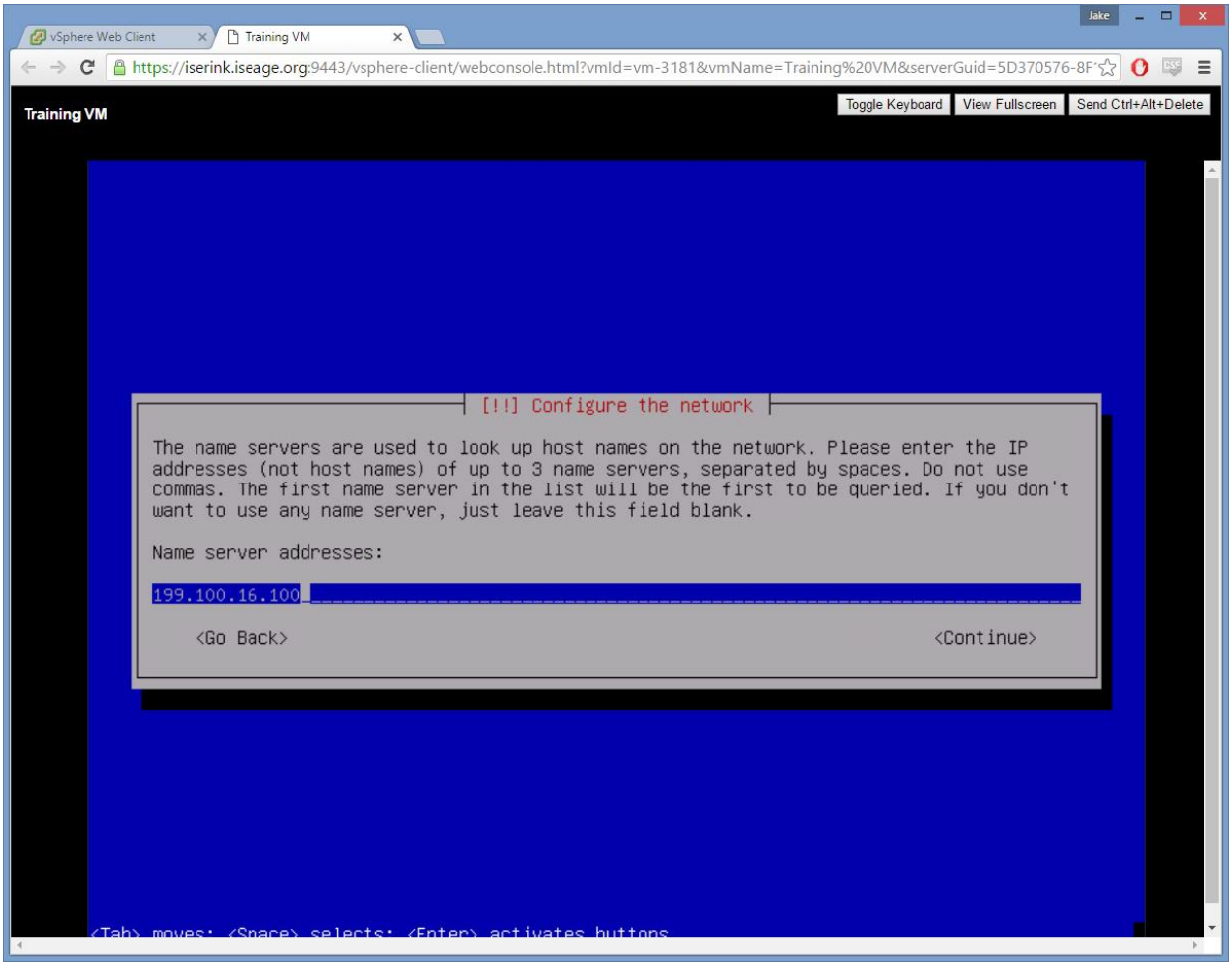
IP Address

Enter the default gateway from the table at the beginning of this document. Note that it is pre-filled, but incorrectly.



The correct default gateway.

Use 199.100.16.100 as the “Name server address”. This address is important to remember: it is also the address of the HTTP proxy from the ISERink to the World Wide Web. The pre-filled value is incorrect.



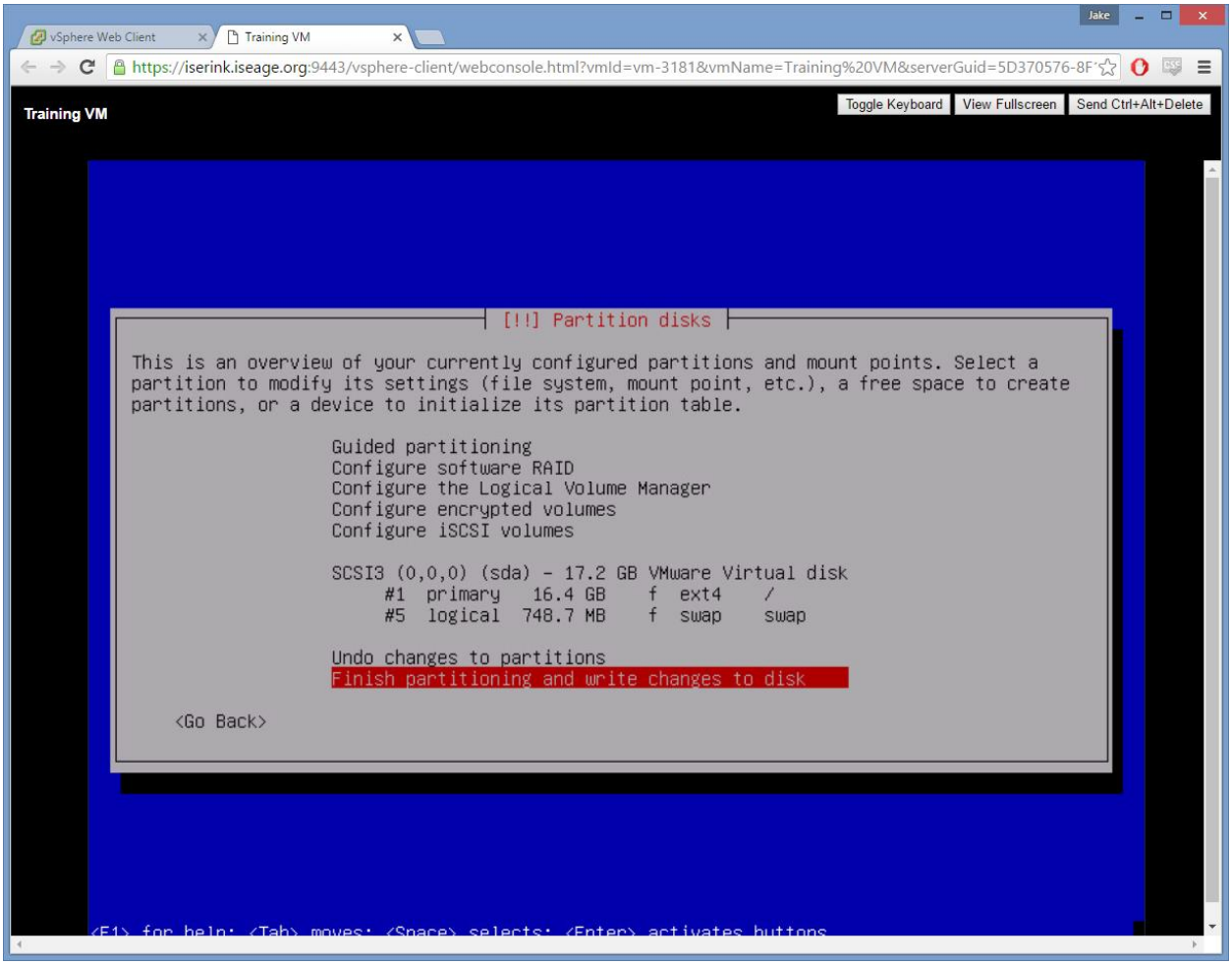
DNS Server address

The selected hostname and domain name are not significant. Select a root password. For this activity, anything is suitable. The ISERink environment is isolated from attacks. There is no need to be concerned about having a weak root password. The primary purpose of the ISERink is to protect poorly-secured machines from the dangers of the real Internet. Additionally, you must create a name, username, and password for a non-root user. Please remember or write down these details. If you are not creative, here is a default configuration:

Root password: toor
User's name: training
Username: training
User's password: training

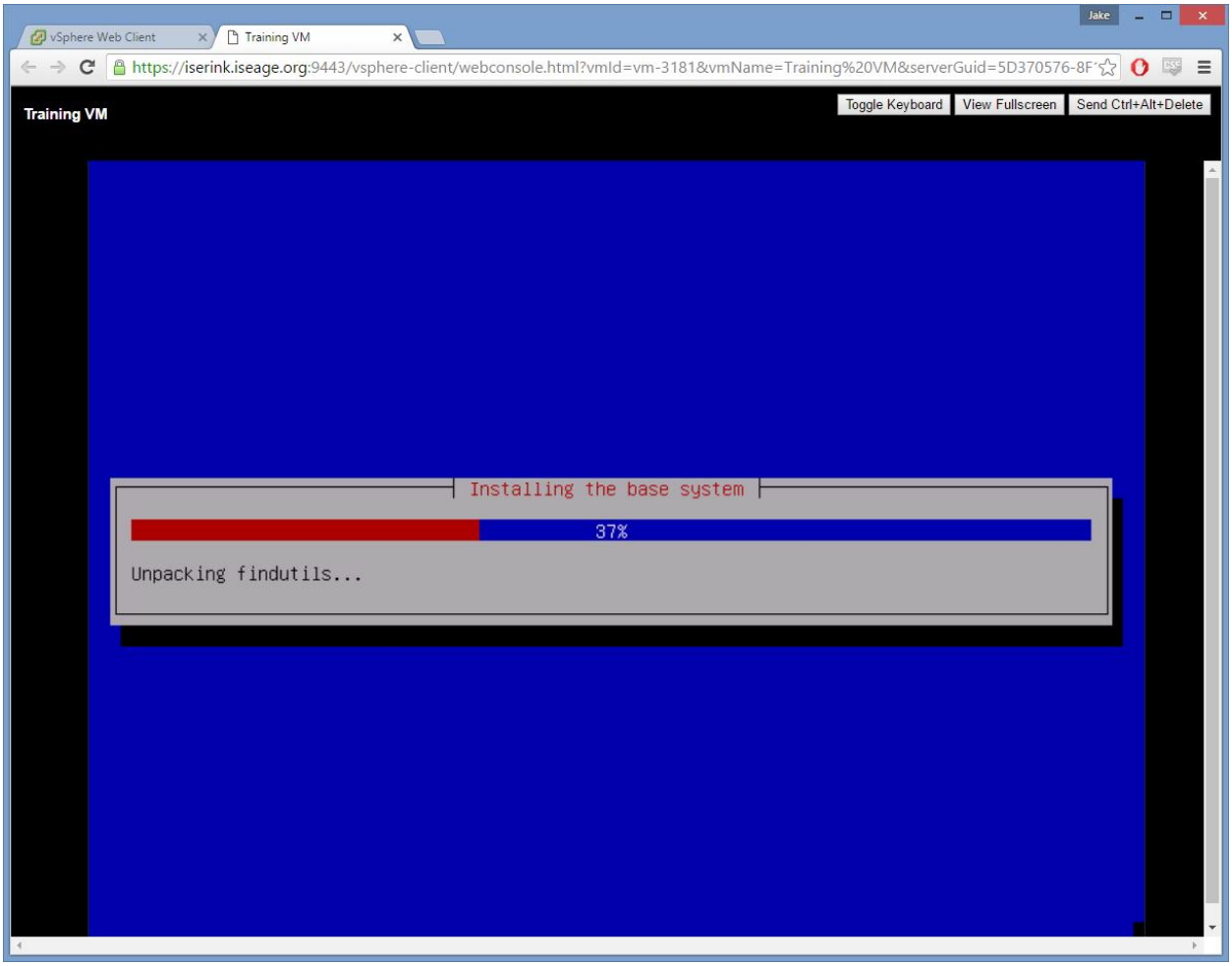
Select the time zone and use the recommended (default) partitioning of "Guided - use entire disk". Select default values throughout this section: The first hard disk, "All files on one

partition”, and then “Finish partitioning and write changes to disk”.



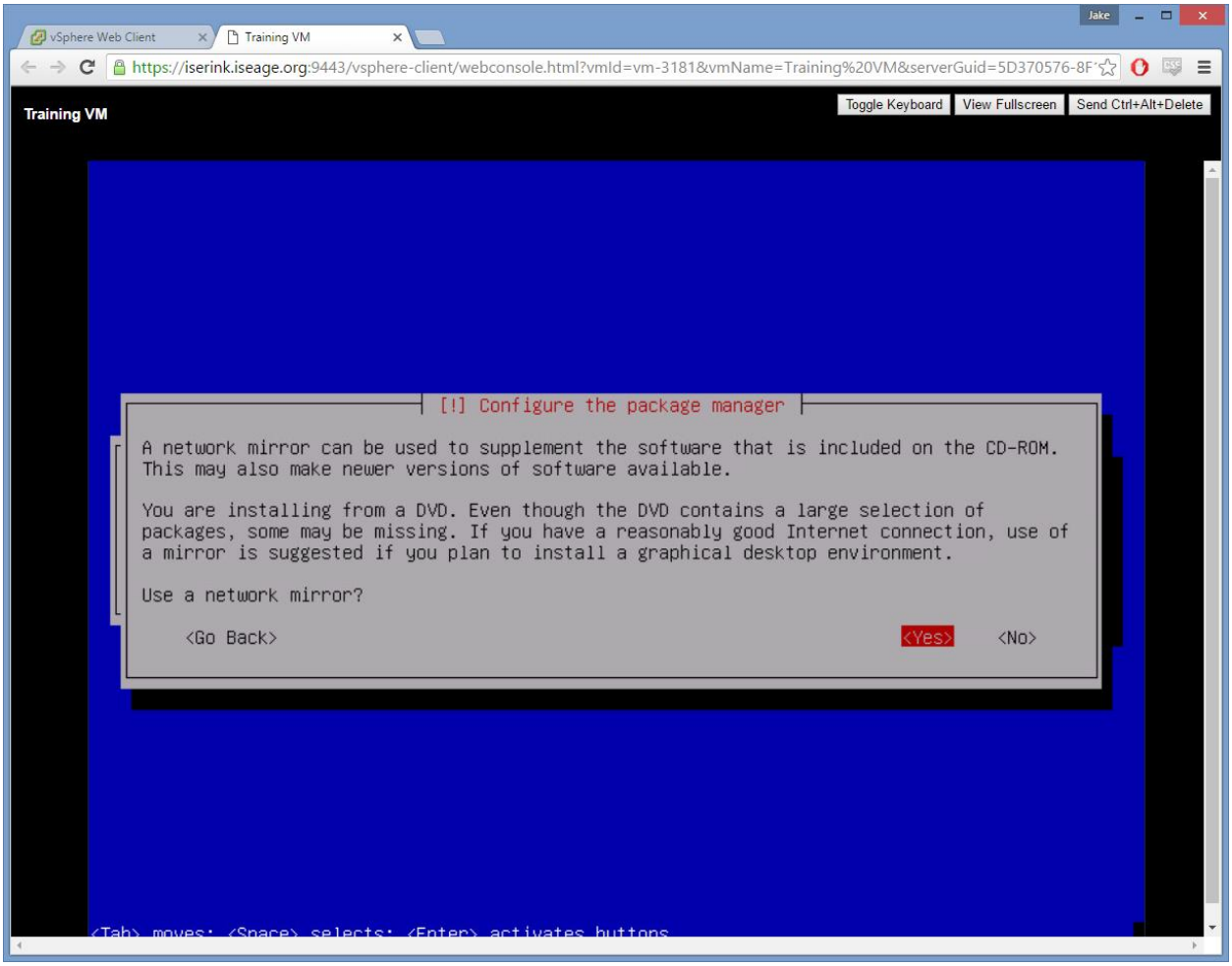
Partition configuration.

You will have to use “tab” to select “Yes” on the confirmation dialog. The installation will begin - this will take several minutes.



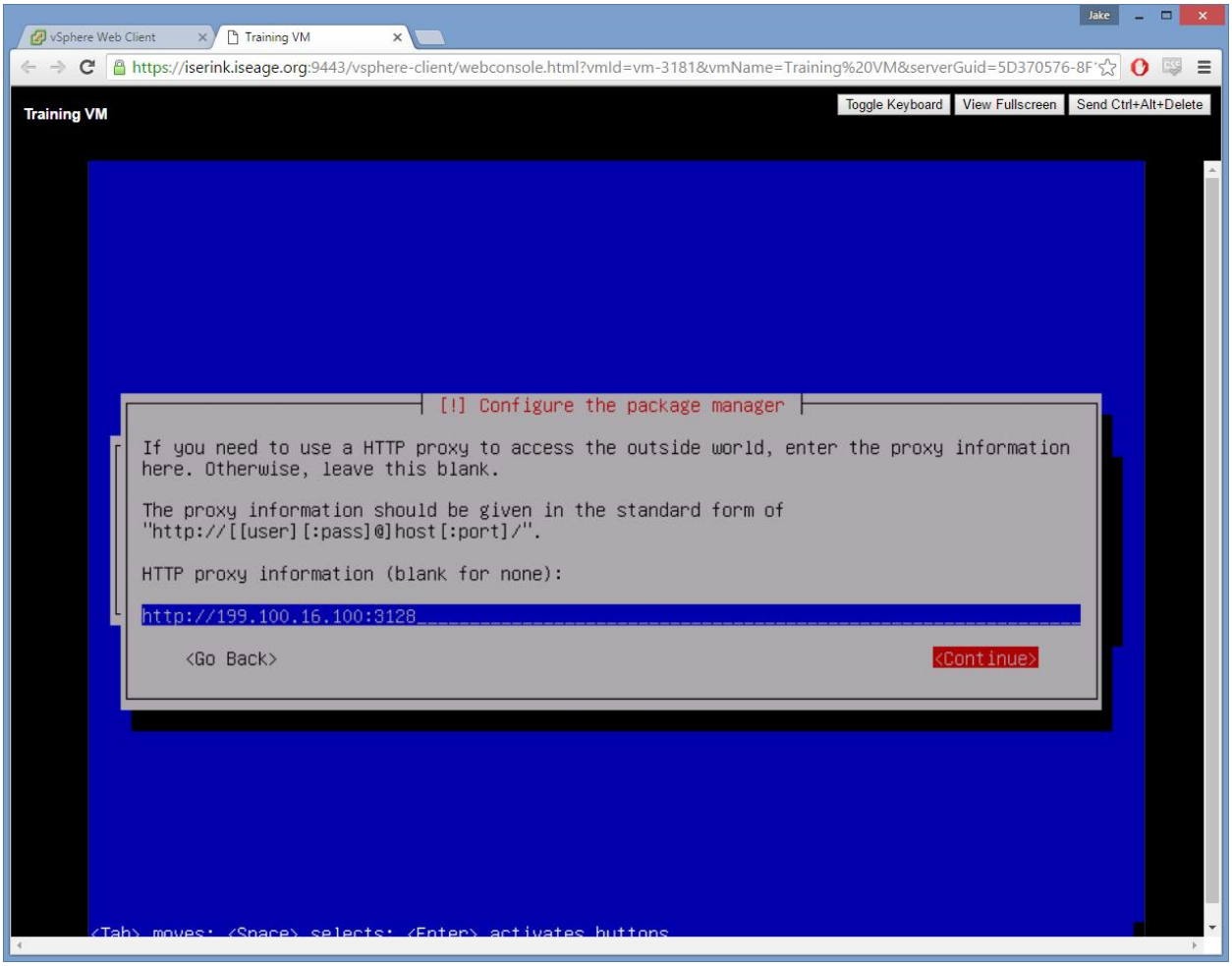
A complimentary cocktail bar is available to help pass the time.

Once the base system has finished installing, there is another pass of options to configure. The first prompt will ask if you want to scan another CD or DVD. Select “no” (default). The next prompt will ask if you wish to use a network mirror. Select “Yes”.



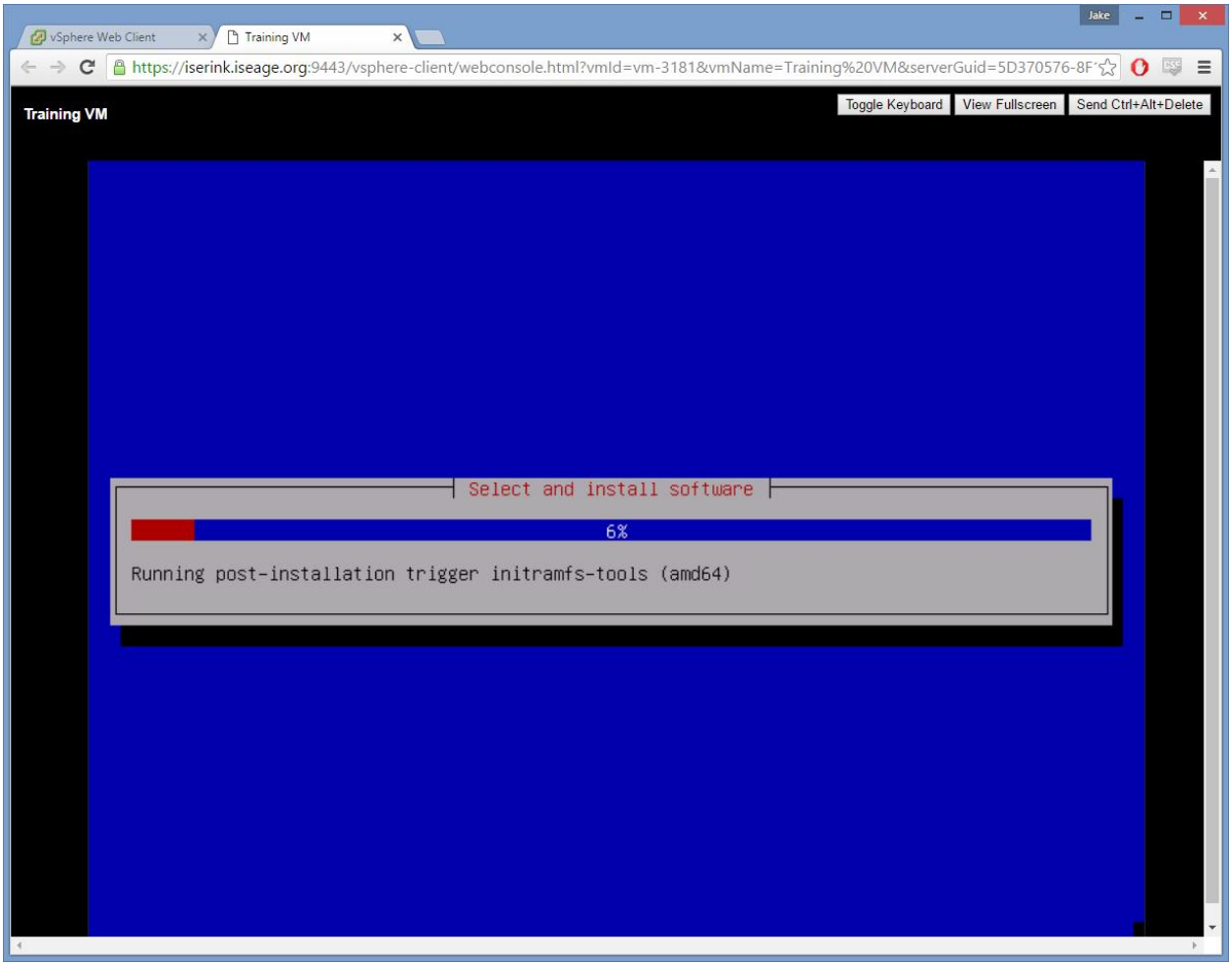
Select “yes” to use a network mirror.

On the next two screens, (Country/Region, and mirror URL). simply press Enter to use the default options (United States, ftp.us.debian.org). The ISERink uses a proxy to access the World Wide Web. The proxy URL is “http://199.100.16.100:3128”. Enter the proxy information when prompted.



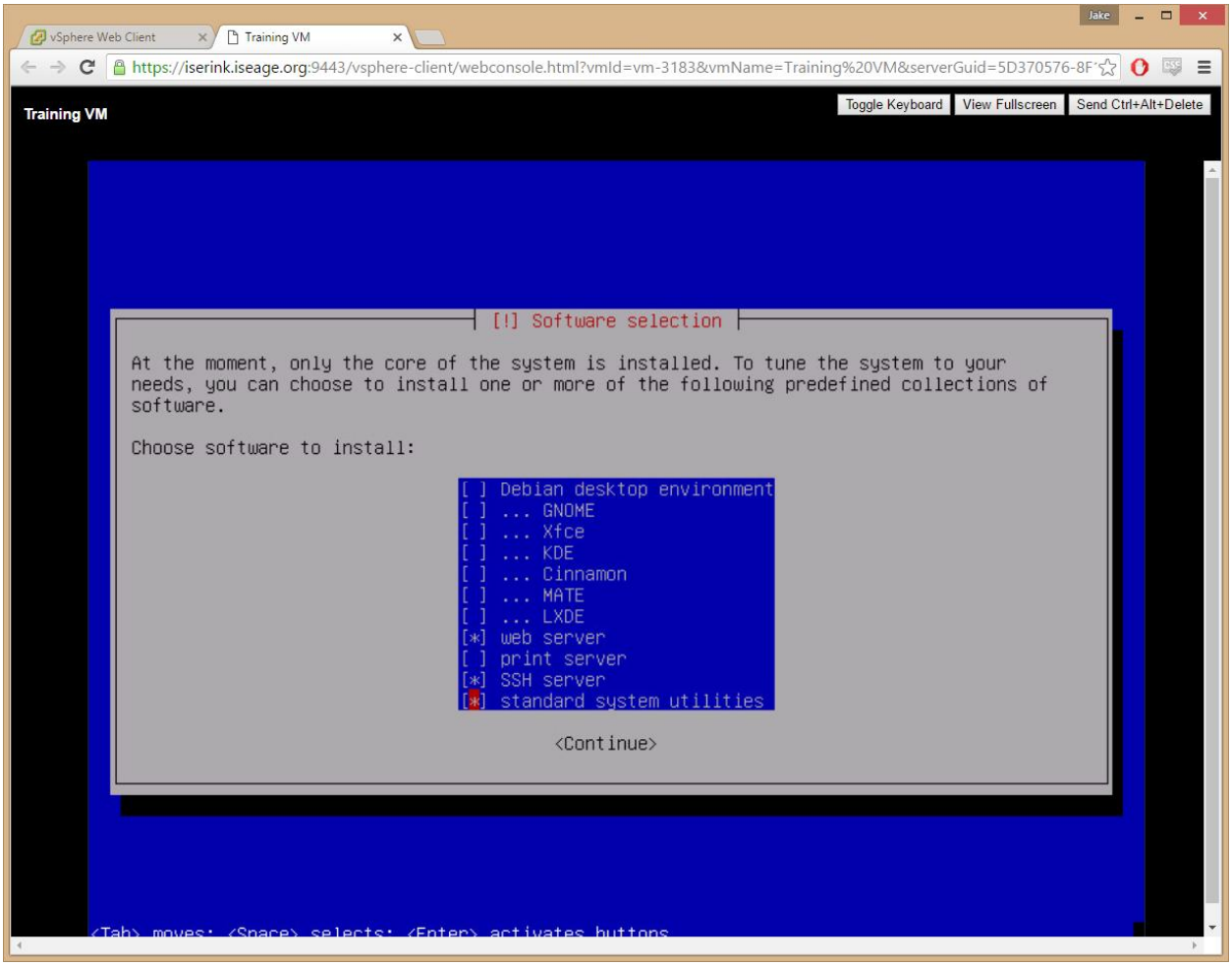
Proxy information entered.

Once the proxy information is entered, Apt will retrieve several files and there will be another wait while additional packages are installed.



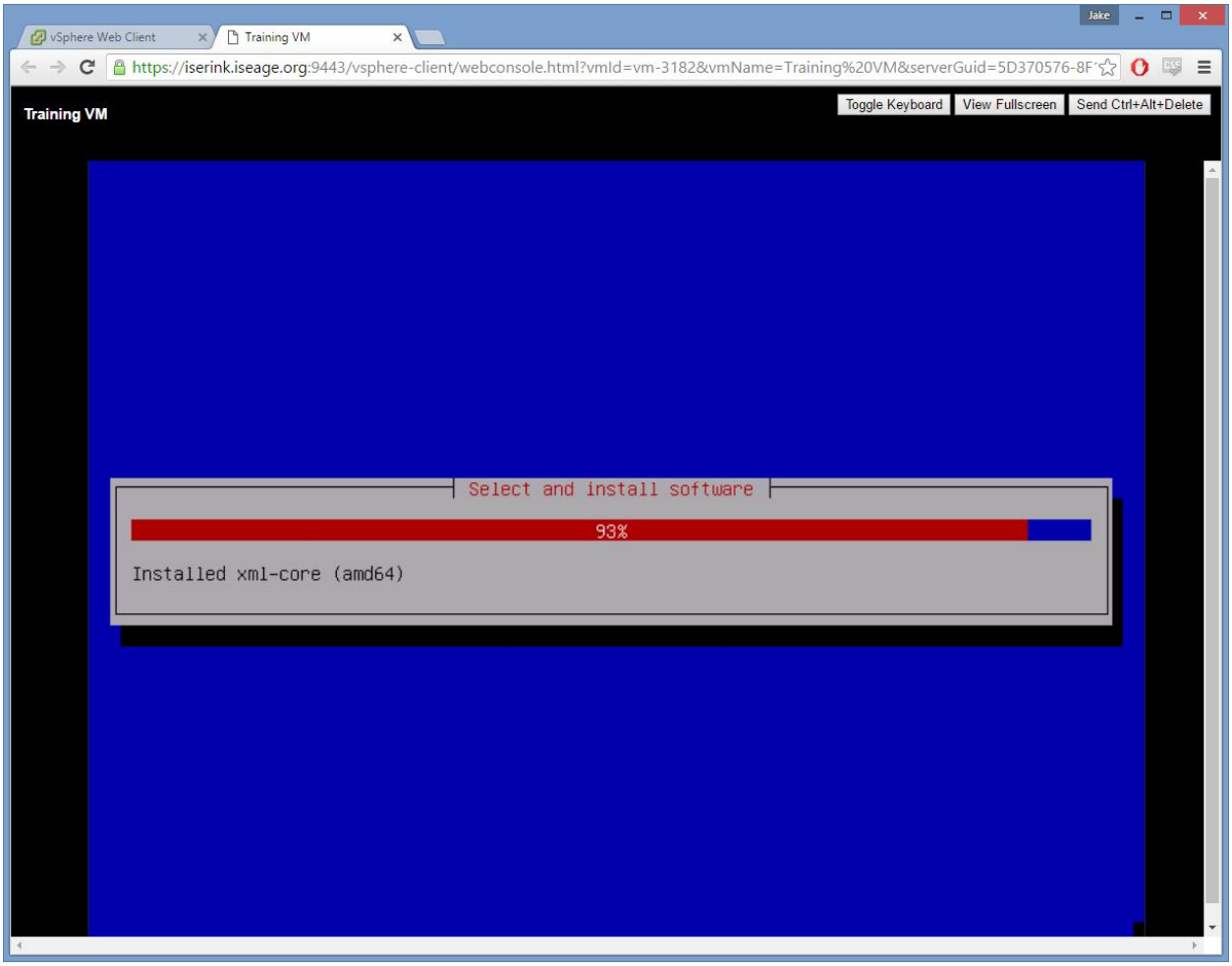
This is another good opportunity to take a break.

There will be another set of options after approximately 5 minutes. Simply select No (default) when prompted about participating in the package usage survey. The next window screen will be used to configure the server. Unselect the desktop environment and print server, and select the web server and SSH server. Leave the standard system utilities selected. **Select/unselect with the spacebar. Enter will continue.**



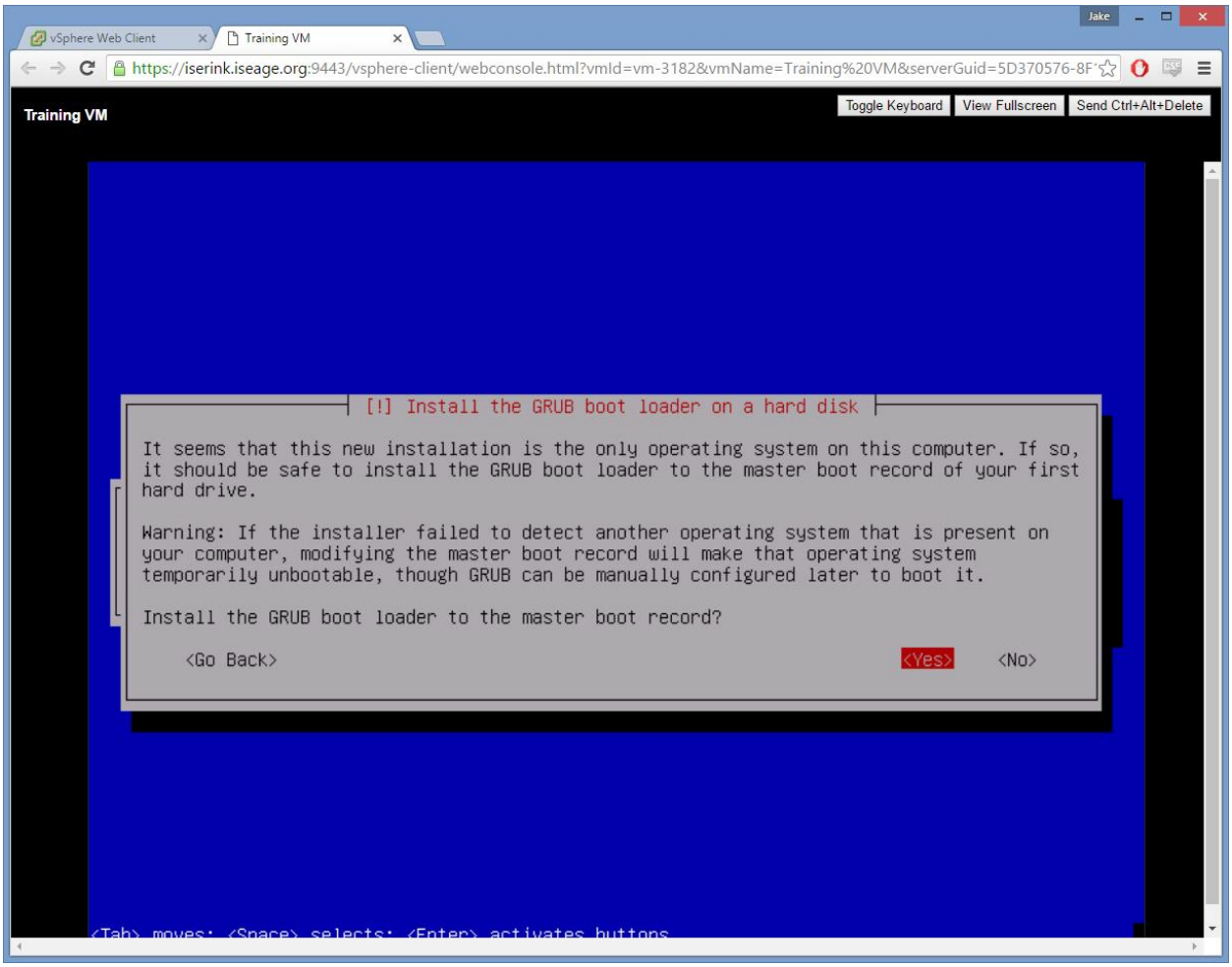
Basic software selection

The installation will take some time.

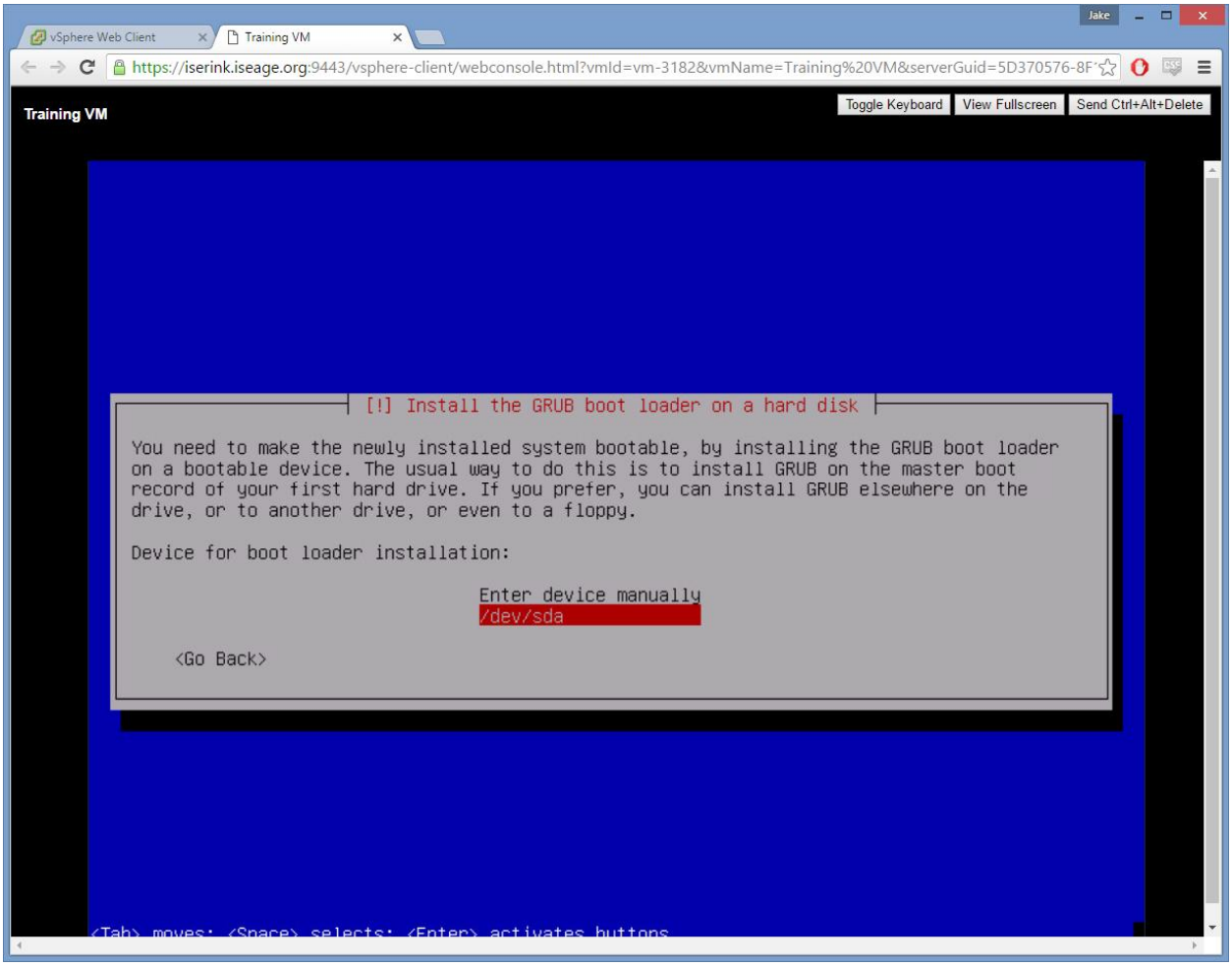


Final installation progress bar

The last configuration options regard the bootloader. Select “Yes” to install GRUB, then choose the first hard disk “/dev/sda1”.



Select “Yes”



Select this disk.

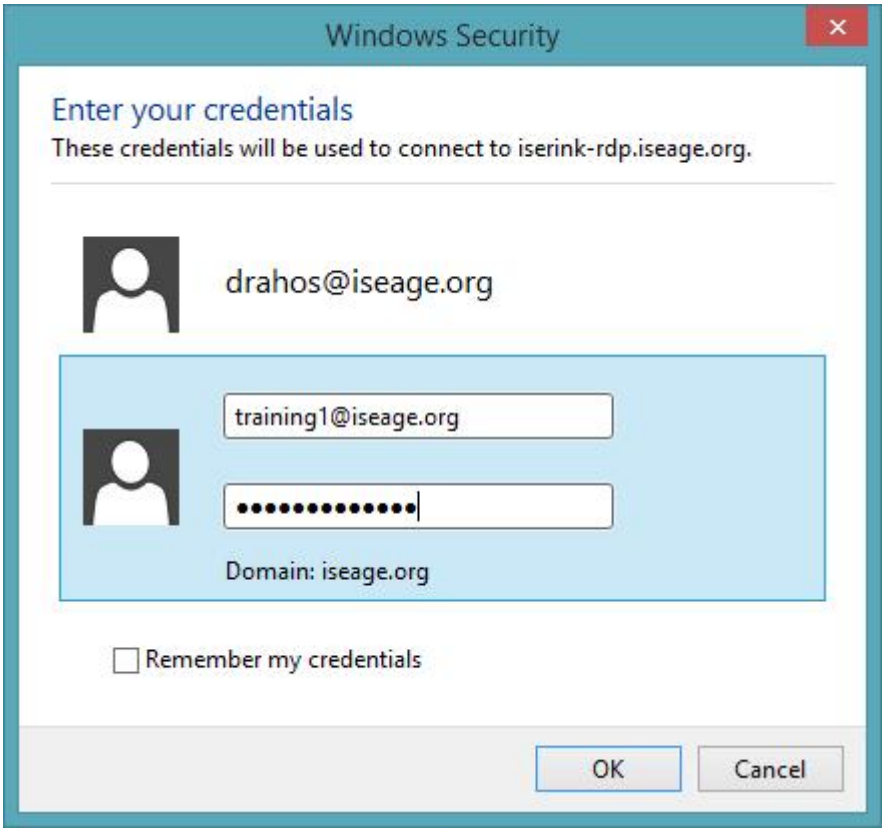
Once the bootloader is installed, the installation will finish and you can select “Continue” to reboot the system. Debian is now installed.

ISERink RDP: PuTTY and Web Browser

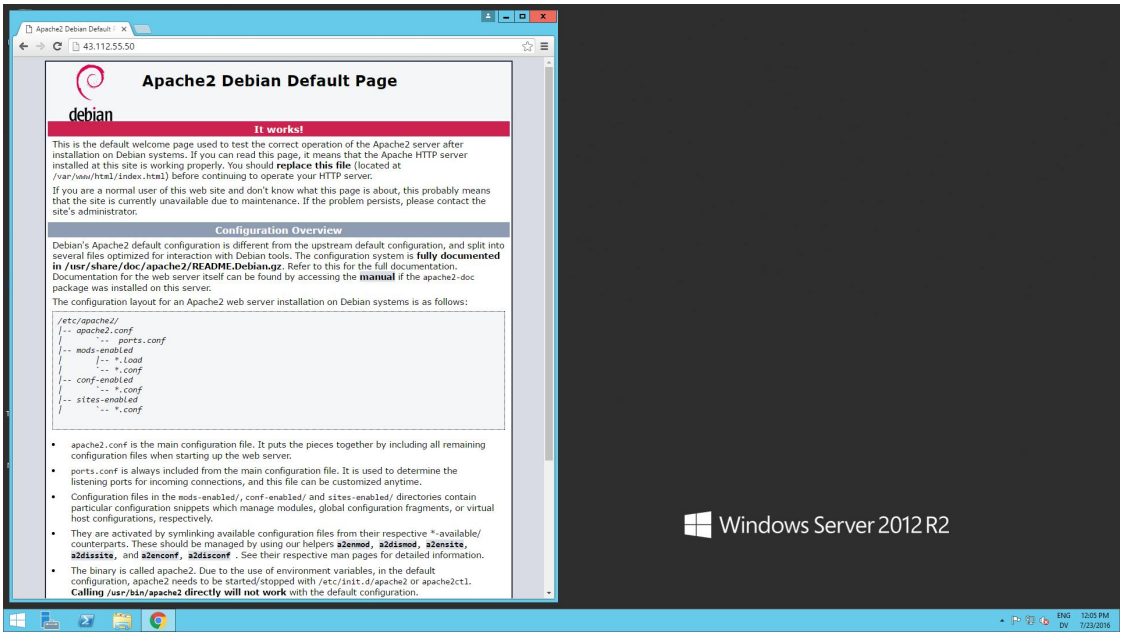
The ISERink environment is isolated from the internet. In order to test your VM, you will have to connect to the ISERink RDP server using a Remote Desktop Protocol Client. The Remote Desktop client in Windows will be shown.

Enter iserink-rdp.iseage.org as the computer, and click connect.

Select “Use another account” if necessary, and enter your domain credentials. ‘@iseage.org’ must be appended to the username.

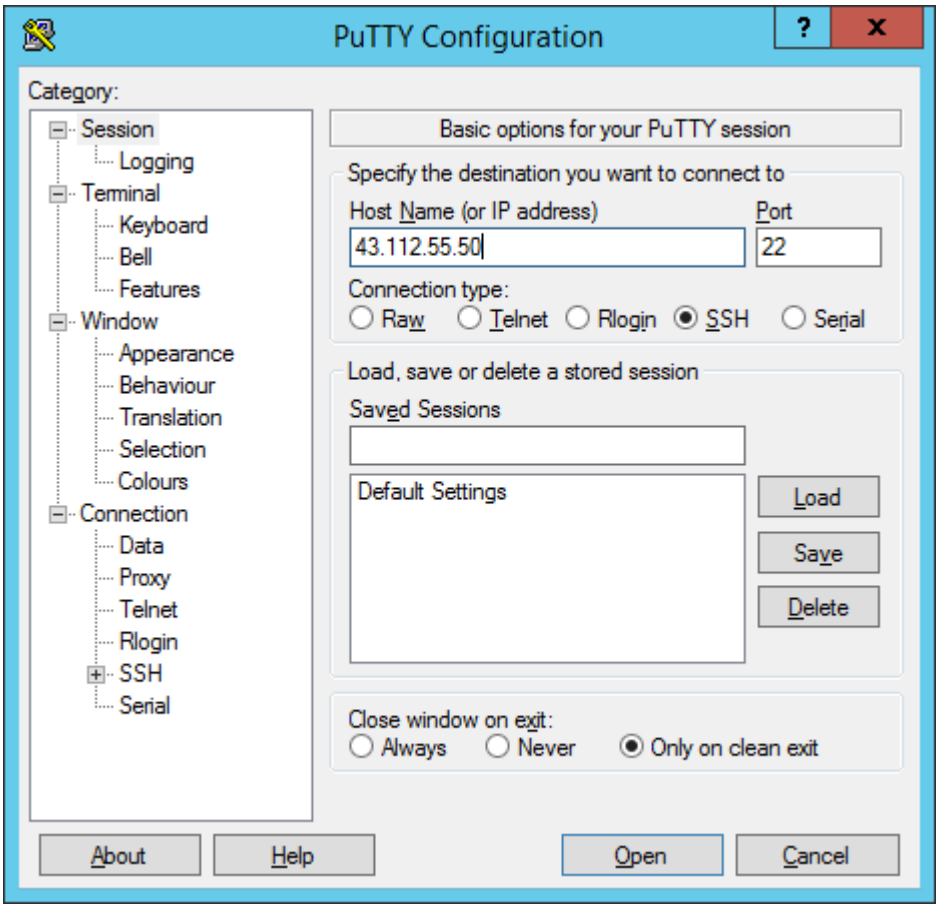


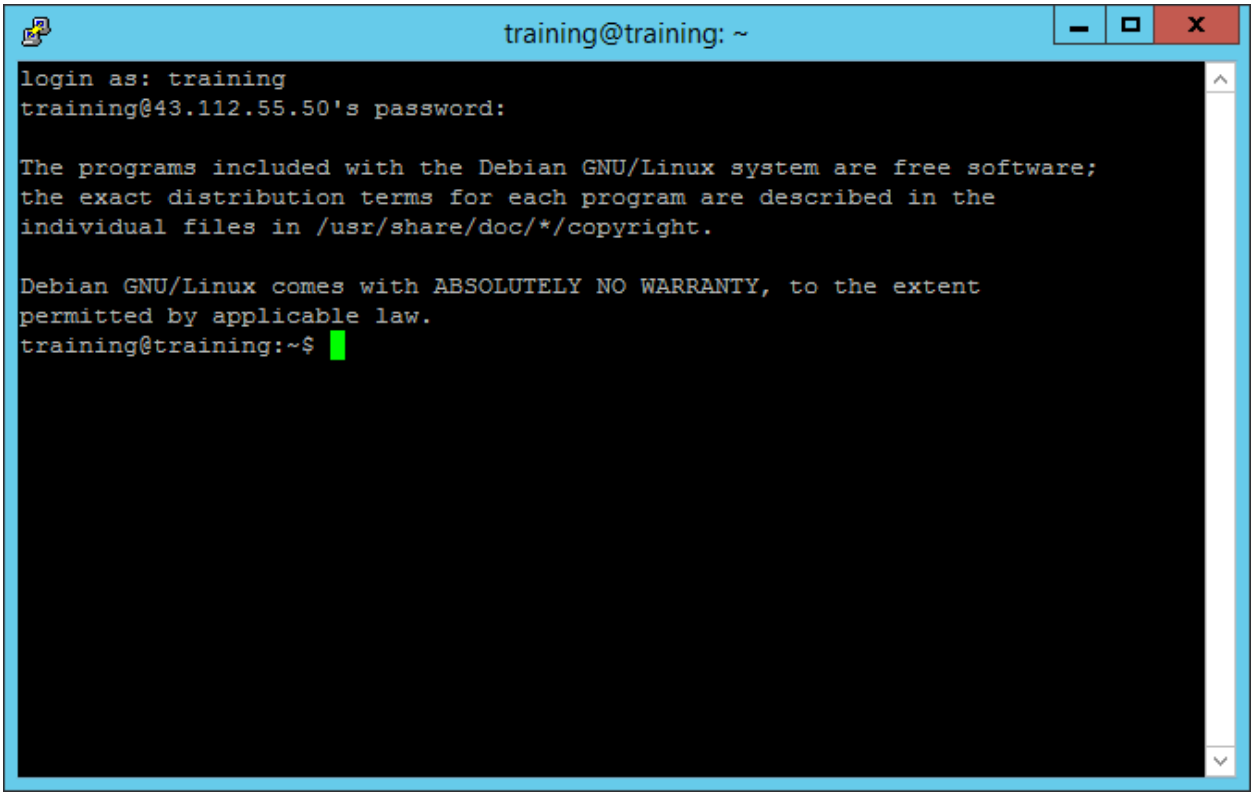
This will create a virtual desktop that is “inside” the ISERink and can directly access services provided by the virtual machines. From the virtual desktop, launch a web browser. Enter the IP Address of your VM in the web browser, and it should load the Debian Default Page as seen below. **Note: If you enter the IP address of your VM from anywhere outside of the ISERink (ie. your laptop), you will not connect to your VM.** This is the ISERink’s isolation at work.



The ISERink RDP also offers a more convenient alternative to the VMWare Virtual Console. The virtual console has many issues (notably lack of copy-paste) that make it inconvenient to

use except as a last resort when the VM is otherwise unreachable. Because the VM was configured with an SSH server, the RDP hop can be used to connect with SSH. Launch PuTTY on the RDP hop. Enter the VM's IP, and log in with the account you created during Debian installation (**NOT** your domain credentials).



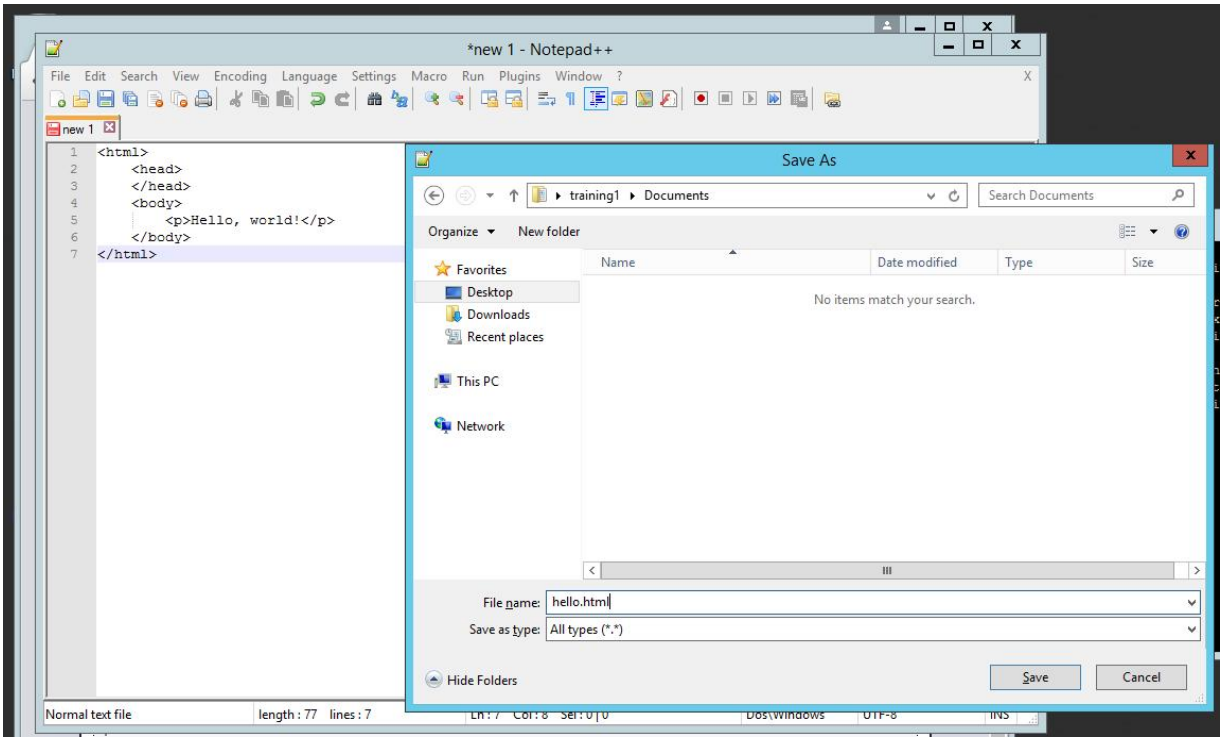


This SSH session can be used to perform any further administration or configuration of the server.

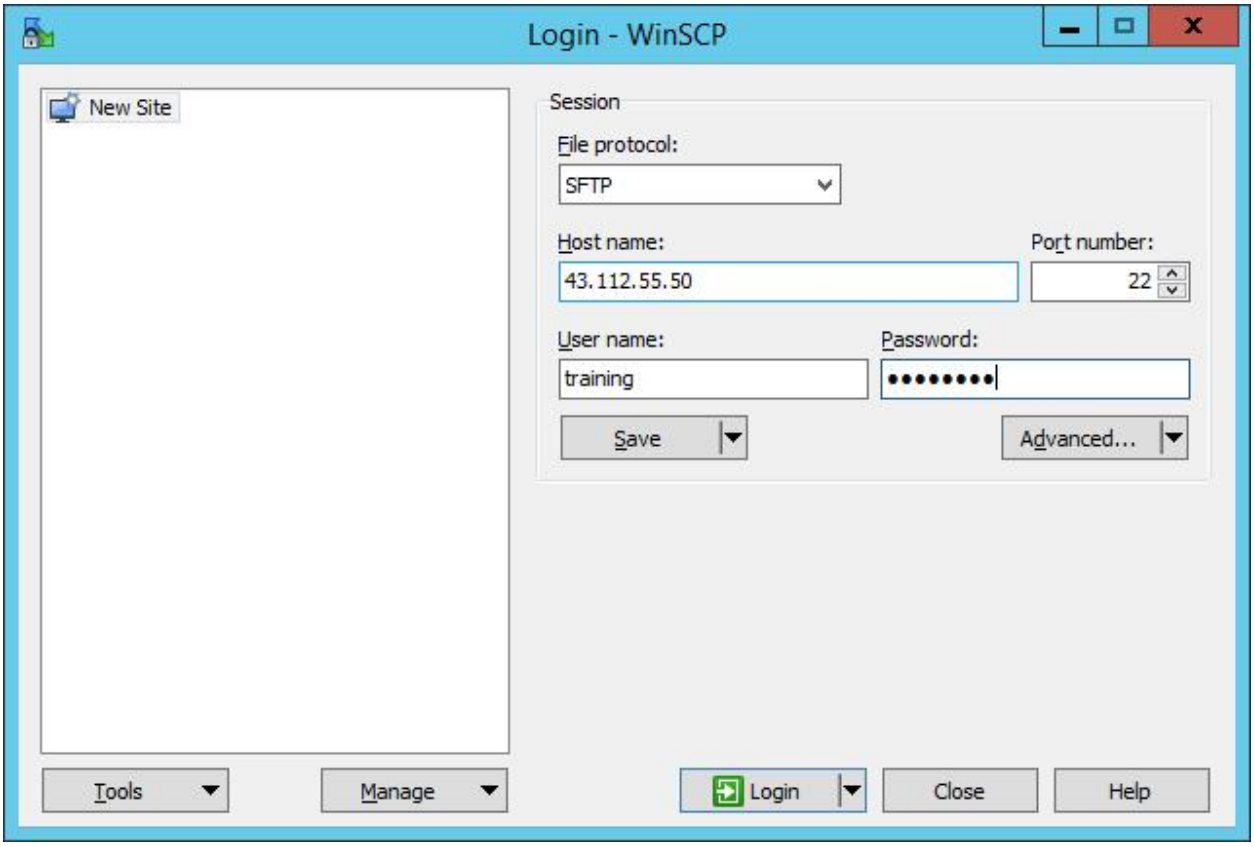
The RDP hop offers a familiar windows environment that is “inside” the ISERink. It also has several useful tools, such as PuTTY and WinSCP. WinSCP can be used to copy files to-and-from VMs within the ISERink. This provides a painless way to download files from the Internet via a web browser on the RDP hop, and then transfer them to the VM with WinSCP. If the user is not familiar with Linux editors and tools, files can also be transferred to the RDP hop and edited with Windows tools, then transferred back. To demonstrate this ability, open a text editor on the RDP hop (Notepad++ is recommended) and enter/paste the following content:

```
<html>
	<head>
	</head>
	<body>
		<p>Hello, world!</p>
	</body>
</html>
```

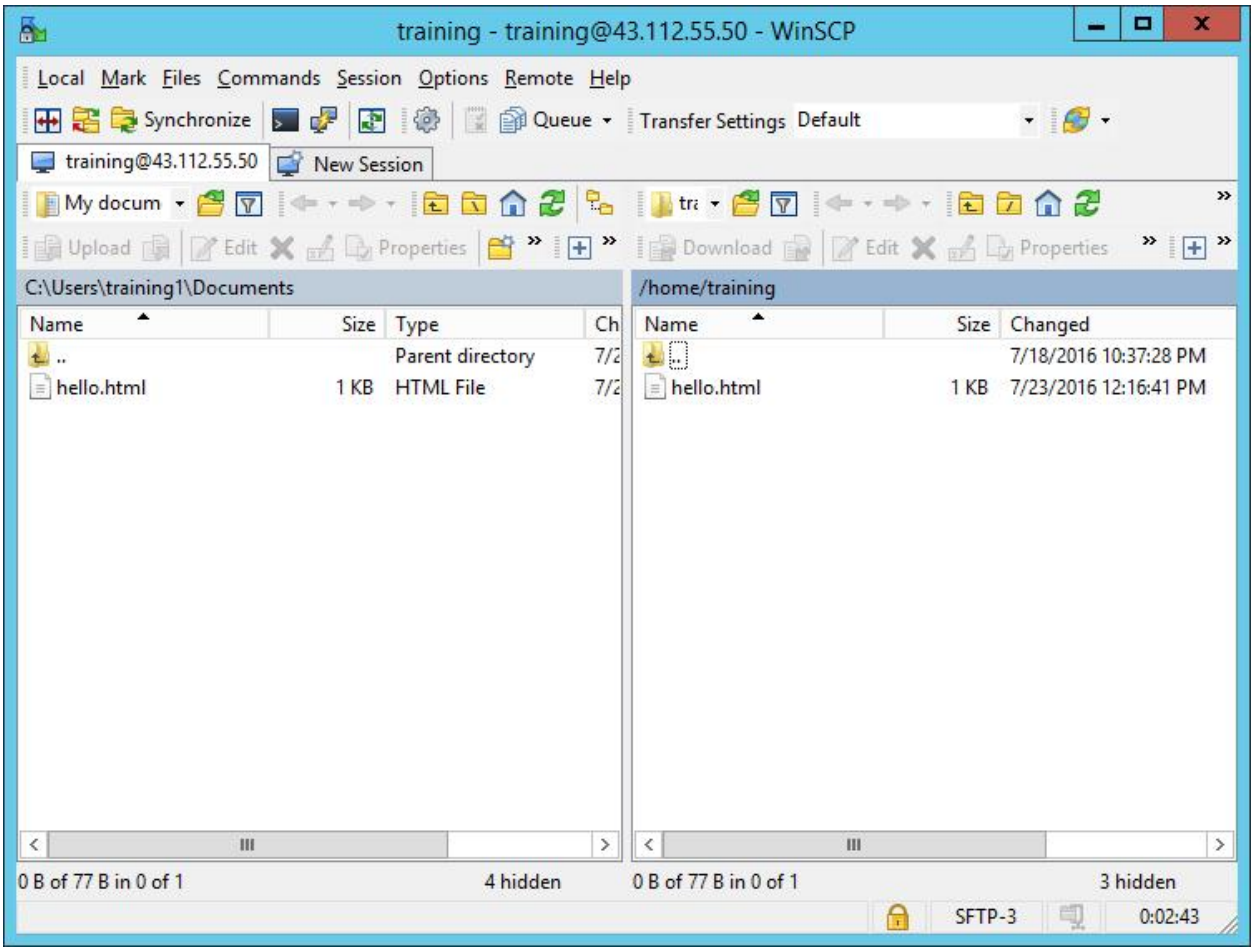
Save this file as hello.html. The exact location does not matter.



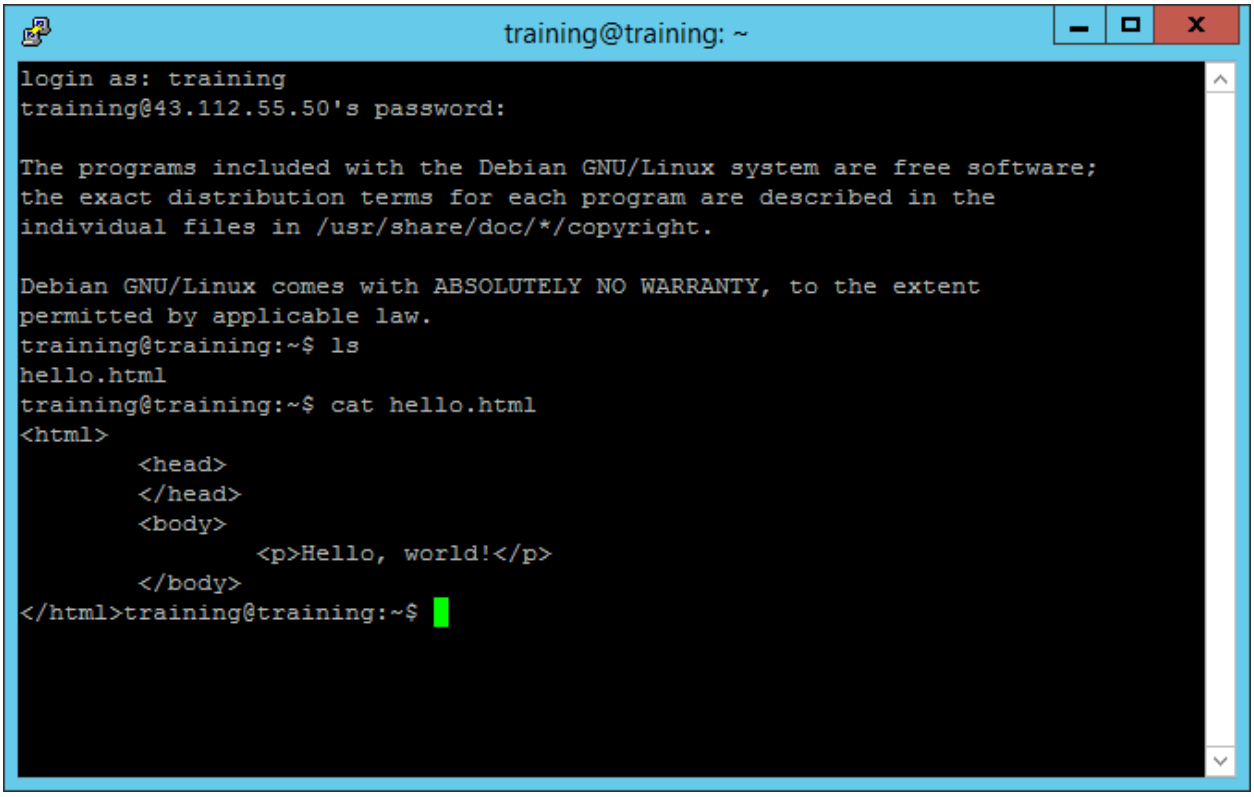
Close the text editor, and launch WinSCP. Enter the IP address and account credentials for your VM.



The WinSCP window shows the RDP hop on the left, and your VM on the right. If necessary, navigate to where you saved the hello.html file on the RDP hop. Then, drag it over to your home directory on the VM. Once you have done this, the file will appear if you run ‘ls’ in the PuTTY session, or print the file with ‘cat’.

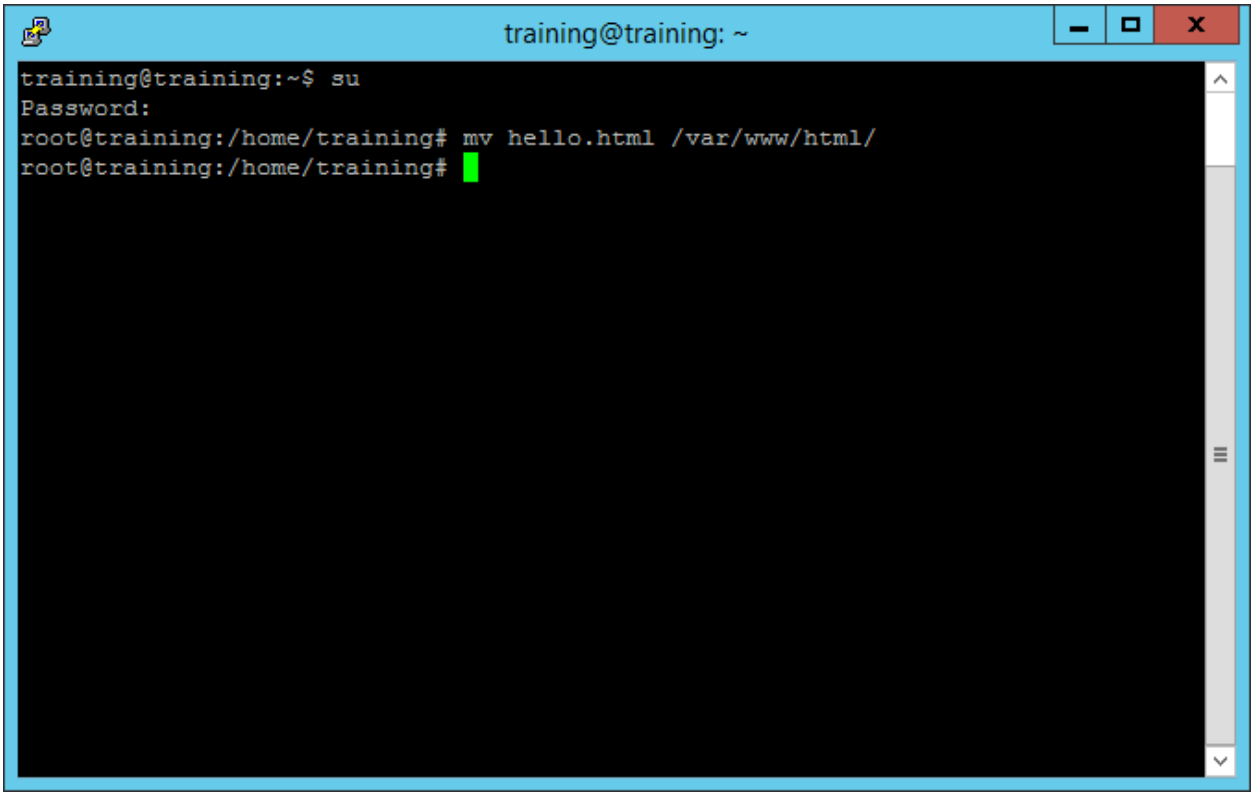


Using WinSCP to copy a file to the VM



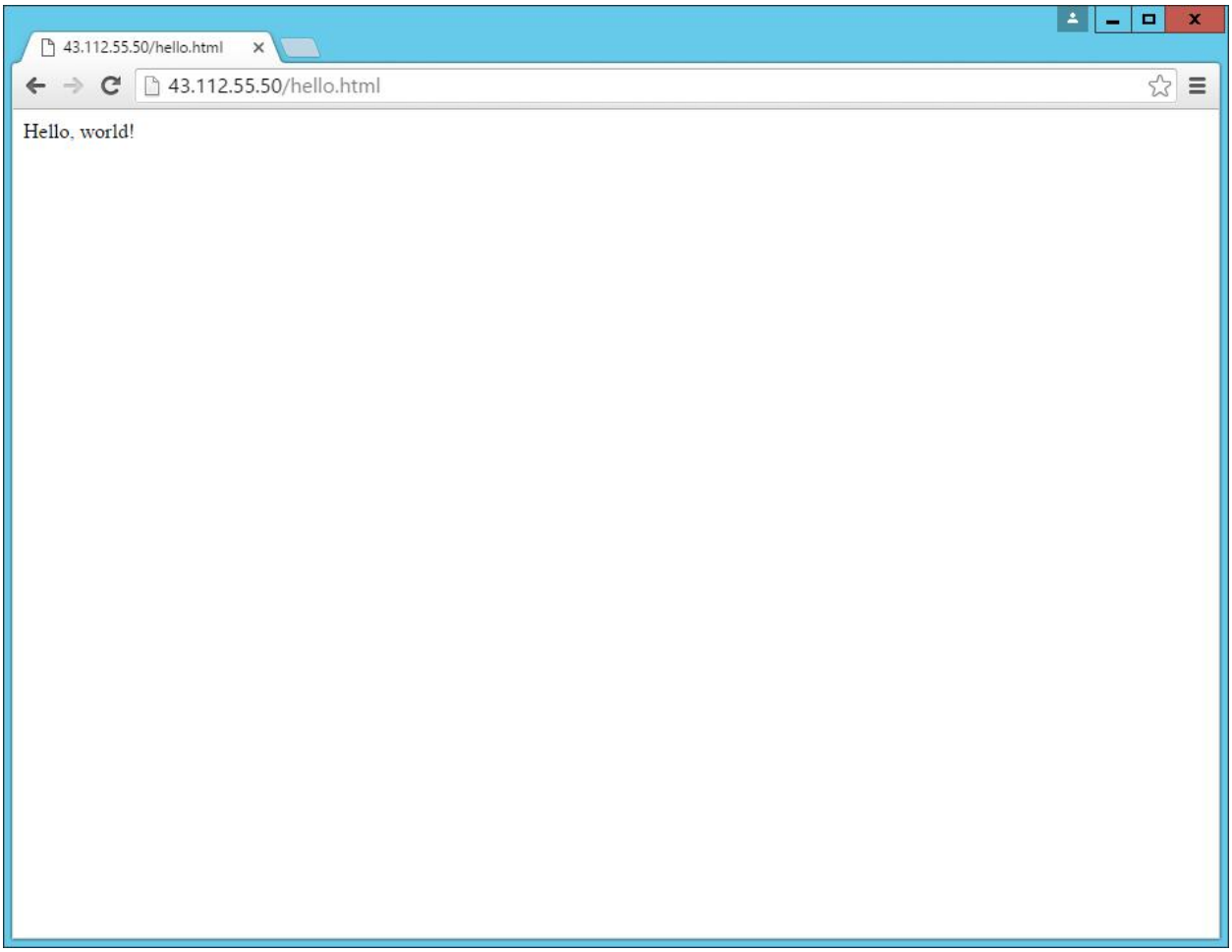
Confirming the file was copied

Finally, the ‘hello.html’ file can be added to the website by moving it into the /var/www/html directory. In order to do this, you must escalate to root by running ‘su’ and then entering the root password. Then, move the file to the webroot with ‘mv hello.html /var/www/html/index.html’.



Moving the file to the website

You can now view hello.html in a web browser.



It works!

This finished the training activity. We hope it is a useful introduction to the basics of using the ISERink environment to set up Linux servers, and that it shows you how to work with and around the isolation provided by the ISERink by using the tools provided.