1. Classroom Environment

Before diving into Salt and MCP, let's take some time to explore the classroom environment. Understanding how things are currently configured is beneficial for your learning as you move forward in the class.

In this lab, we will explore this currently configured environment to help with the execution of future labs.

Chapter Details	
Chapter Goal	Explore the classroom environment
Chapter Sections	*1.1. Organizational Notes* *1.2. Working with Remote Environment* *1.3. Analogies with Real Use Cases* *1.4. Working with Desktop* *1.5. Working with Terminal Emulator* *1.6. Working with Firefox* *1.7. Working with Virtual Machine Manager* *1.8. Frequently Asked Questions*

1.1. Organizational Notes

All students have their own environments to perform exercises independently. The Instructor will assign personal environments at the beginning of the class.

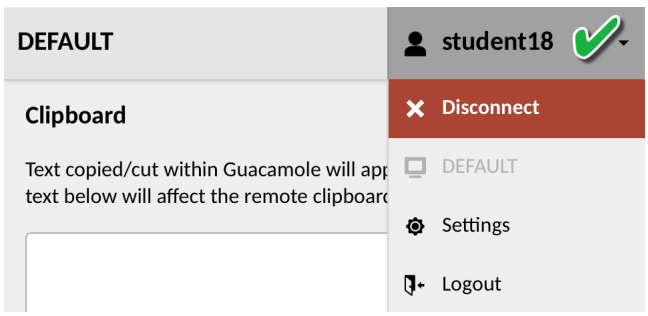
1.2. Working with Remote Environment

1.2.1. Accessing the environment via VNC

There are several options to access the classroom environment via VNC:

- **Web Browser with HTML5 support** (Chrome, Firefox)

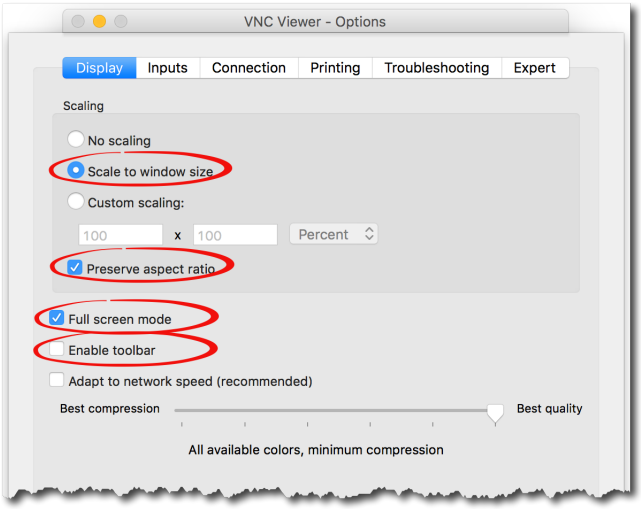
  Use the address provided by your Instructor to access the classroom environment using your browser. In the web browser, you can bring up the menu by pressing Left `Ctrl` + left `Alt` + left `Shift`. In the menu, you can sign-out by clicking the `Student` button.



- **Real VNC Viewer** (Linux, OS X, Windows)

Download and install Real VNC Viewer from the following URL:
http://www.realvnc.com/download/viewer/

In Real VNC Viewer, we recommend to use the full screen mode, scale to window size and disable toolbar:



- **Screen Sharing** (OS X)

  For OS X you can use internal VNC client. Open `Finder`, press `Command-K` or from menu choose `Go`, `Connect to Server` and enter `vnc://<server>:<port>` in the `Server Address` field.

- **TightVNC Java Viewer** (any OS, requires Java SE version 1.6 or later)

  Download jar file from the following URL:
  http://www.tightvnc.com/download.php

  Use the following command to connect to the classroom environment:

```
java -jar tightvnc-jviewer.jar -host <host> -port <port>
```

Important:

Some VNC clients will complain about an unsecure connection. Just ignore the message, because we use temporary environments for each student, and we will tear down the environments after the course.

1.2.2. Accessing the environment via SSH

To access the classroom environment using your standard SSH client use the server name and port provided by your Instructor:

```
$ ssh stack@<server> -p <port>
```

1.3. Analogies with Real Use Cases

In the classroom environment, we use virtual machines instead of physical servers. The instructions we provide in this workbook are also relevant for real use cases with the following

assumptions:

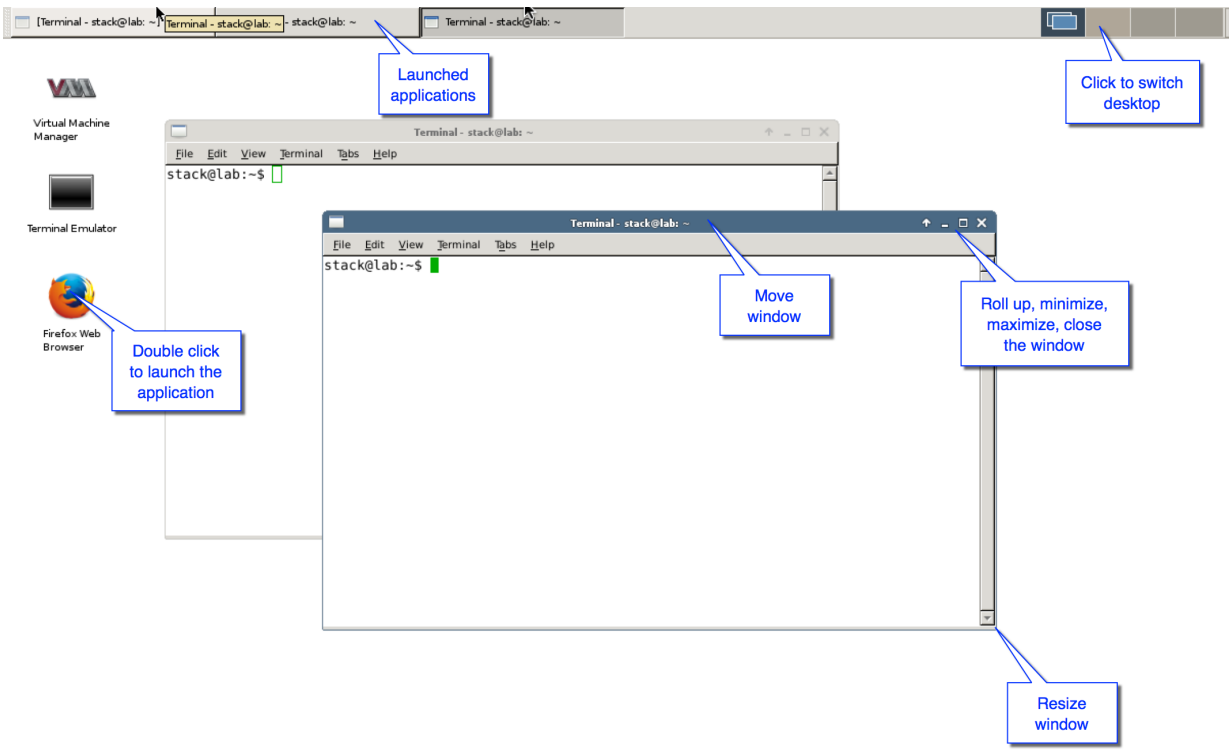
- Instead of virtual networks that we create or provide in the classroom environment, you should use L2 networks configured in your data center.
- Creating a new virtual machine with the specified parameters is similar with mounting a new physical server into a rack in your data center.
- Creating new network interfaces (NICs) for a virtual machine and assigning them to virtual networks is equivalent to connecting NICs in a physical server to physical networks.
- Provisioning a newly created virtual machine via PXE is similar to provisioning a bare metal server in your data center.
- Using a provisioned virtual machine (virtual machine with operating system installed) in the classroom environment is similar with using a new provisioned physical server or virtual machine in your data center.

Important:

In the classroom environment, we use virtual machines with minimal capacity that is sufficient for the lab exercises. For real deployments, use the hardware resources that are recommended for deployments in production. Also we use the default security settings, such us user names, passwords, and self-signed certificates. Plese refer to the “MCP Security Best Practices” document for recommended settings in production.

1.4. Working with Desktop

After logging in to the environment, you will see, that a lightweight desktop manager has been installed in the environment, where you can switch between virtual desktops and run applications.



We recommend that you use different desktops for different applications to simplify navigation between windows. For example, you can use the first desktop for Virtual Machine Manager and

its windows, the second one - for Firefox.

Click on desktop icons in the top right corner to switch the desktop. Double click on the application to launch it. Right click to access context dependent operations, such as `Setting`, `Copy` or `Paste`.

1.5. Working with Terminal Emulator

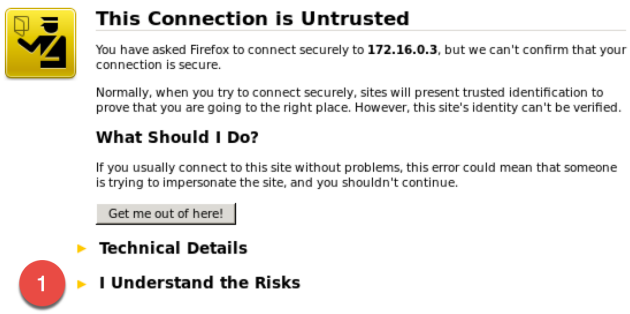
`Terminal Emulator` is often referred to as `terminal` or `shell`. You can use it as a regular shell in your environment: edit files (`vi`, `vim`, `nano` are available) and log in to the other machines, including virtual ones, using `ssh`.

To select a text in Terminal Emulator, press and hold down your left mouse button, extend the selection to the other end of the text, and then release the mouse button. Then, you can press the middle mouse button to paste the selected text to another window. Alternatively, you can use `Copy` and `Paste` actions, which are available in the context dependent menu (press your right mouse button).

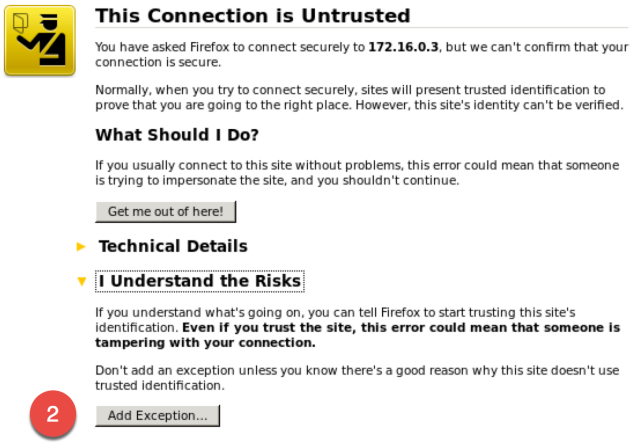
1.6. Working with Firefox

In some cases, we will use self-signed certificates to secure HTTP endpoint, so when you open such web pages for the first time, Firefox will complain about using untrusted connection. This is normal behavior for all modern browsers. Here are 3 simple steps to disable such message for the specific site.

Step 1 Open a site, secured by HTTPS and self-signed certificate. Firefox will show the message `This Connection is Untrusted`. Click on `I Understand the Risks`.



Step 2 Click `Add Exception...`.

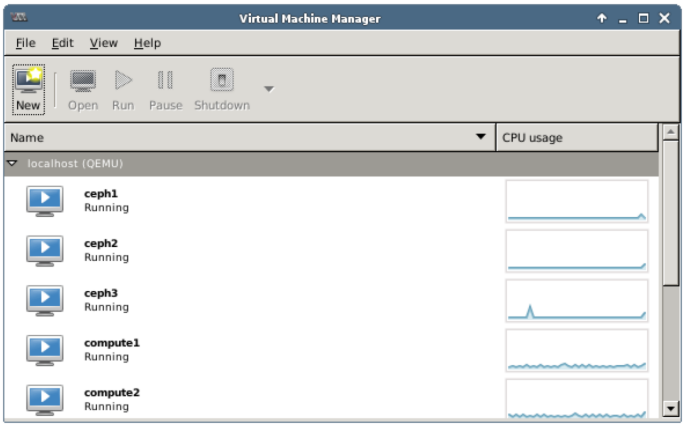


Step 3 In the next window, make sure, that `Permanently store this exception` is checked on and then click `Confirm Security Exception`.

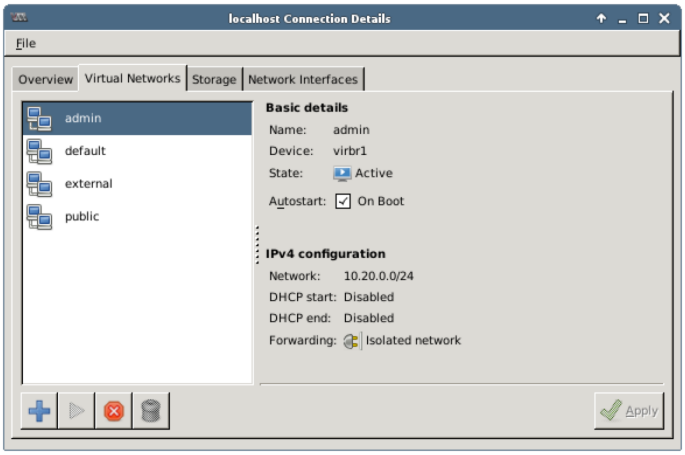
1.7. Working with Virtual Machine Manager

`Virtual Machine Manager` is an open source graphical tool to manage VMs. It primarily targets `QEMU/KVM`, but can also manage `Xen` and `LXC` (Linux containers). It allows you to create a new VM, configure and adjust VM resource allocation and virtual hardware. An embedded VNC and SPICE client viewer presents a full graphical console to the VM.

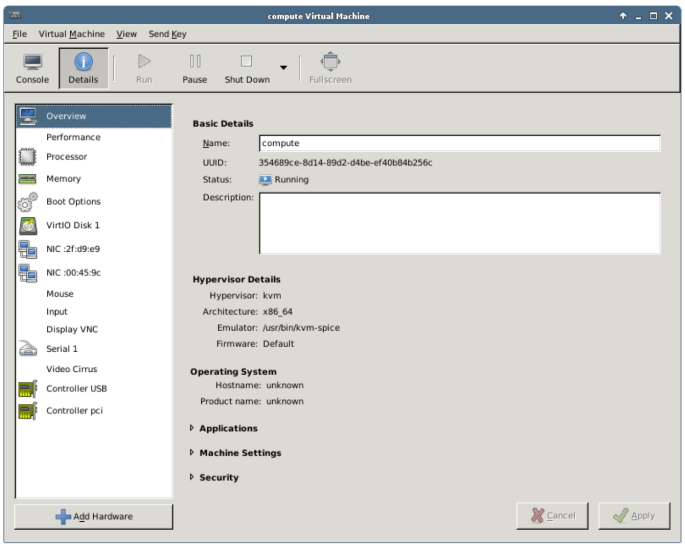
Double click on `Virtual Machine Manager` application or run `virt-manager` application in Terminal Emulator.



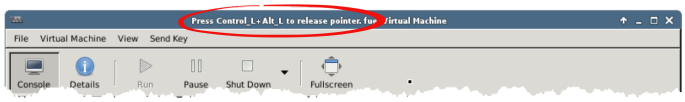
From menu choose `Edit`, `Connection Details` to open the `Connection Details` window, where you can manage virtual networks, storage pools and volumes.



From menu choose `Edit`, `Virtual Machine Details` to open the `Virtual Machine` window for the currently selected VM, where you can manage VM details (`Details` button), manage its state (`Run`, `Pause`, `Shut Down` buttons) and view its console. Alternatively, you can double click on VM from the list to open the same window.



If you click on your mouse button inside the VM console, then the console will grab the mouse pointer and you will not be able to use your mouse outside of the console window. To check if the console grabbed the pointer, check its window title to see if the title contains `Press Control_L+Alt_L to release pointer`. To release the pointer, press left `Control` and left `Alt` (left `Control` and left `Command` on Mac) keys simultaneously, as the title says.



1.8. Frequently Asked Questions

This list contains frequently asked questions that pertain to the environment or exercises.

- I cannot connect to the environment using my VNC viewer.

  Check that you are using the correct IP address, port and password. Check that you are using compatible VNC viewer from the list (*1.2. Working with Remote Environment*). Check that your local firewall allows outgoing connections to the specified port.

- Firefox complains that the connection is not trusted, what should I do?

  Please read section *1.6. Working with Firefox* for a workaround.

- My mouse stopped working in the remote environment.

  Check if the Virtual Machine Manager grabbed your mouse pointer (*1.7. Working with Virtual Machine Manager*). Press left `Control` and left `Alt` (left `Control` and left `Command` on Mac) simultaneously to release the pointer.

- How could I copy a selected text to the clipboard or/and paste a text from the clipboard?

  Some VNC clents do not support sharing the system clipboard with VNC session. However, to complete the steps provided in this document, you can use copy and paste functions directly in the VNC session. The electronic version of this document is available directly in your environment: press `Home` button in Firefox (or just open a new Firefox session) to open the electronic version. Then you can use standard techniques to select a text and copy it to the clipboard. Pasting a text from the clipboard depends on the application: in many cases you can click on the middle mouse button (if you have one) to paste a previously selected text to the current cursor position (you do not even need to press *Ctrl-C* and *Ctrl-V*).

- The specific step failed, or I cannot initiate the next step for some reason

  The environment allows you to be flexible in choosing names, IP addresses and other parameters for the steps in this course. However, the chapters in the course are connected to each other in such a way that the results from one chapter are required for the next one. We highly recommend that you use names, IP addresses and other parameters exactly as they are specified in the steps below. Also, using the same parameters will help us identify the issue. We highly recommend that you execute all the steps as listed. Please do not skip any steps or make any additional unspecified steps, such as changing the default password.

  If one specific step failed (for example, you have received unexpected error message), or you cannot initiate the next step for some reason, please check that you executed all previous steps exactly as they are specified. In most cases, you can go back several steps, for example, deleting a VM and creating a new one.

  If you feel as you executed all the steps correctly, ask the instructor. Be sure to let them know of any variations you may have made to the standard flow. The instructor will help

you solve the issue, and in the worst case, can revert the whole environment to the one of the predefined state, so you can continue working with the class.

Checkpoint:

- Receive a lab environment assignment
- Use web browser or VNC client to access the environment
- Use SSH client to access the environment
- Read Frequently Asked Questions