

RH415 - Red Hat Security

Linux in Physical, Virtual, and Cloud

Travis Michette

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Introduction

VMs running on FoundationX share an external 172.25.250.0/24 network, with a gateway of 172.25.250.254 (workstation.lab.example.com). DNS services for the private network are provided by 172.25.250.254 (workstation), so the Workstation VM must be started first.

Environment Overview and Launching an Instance

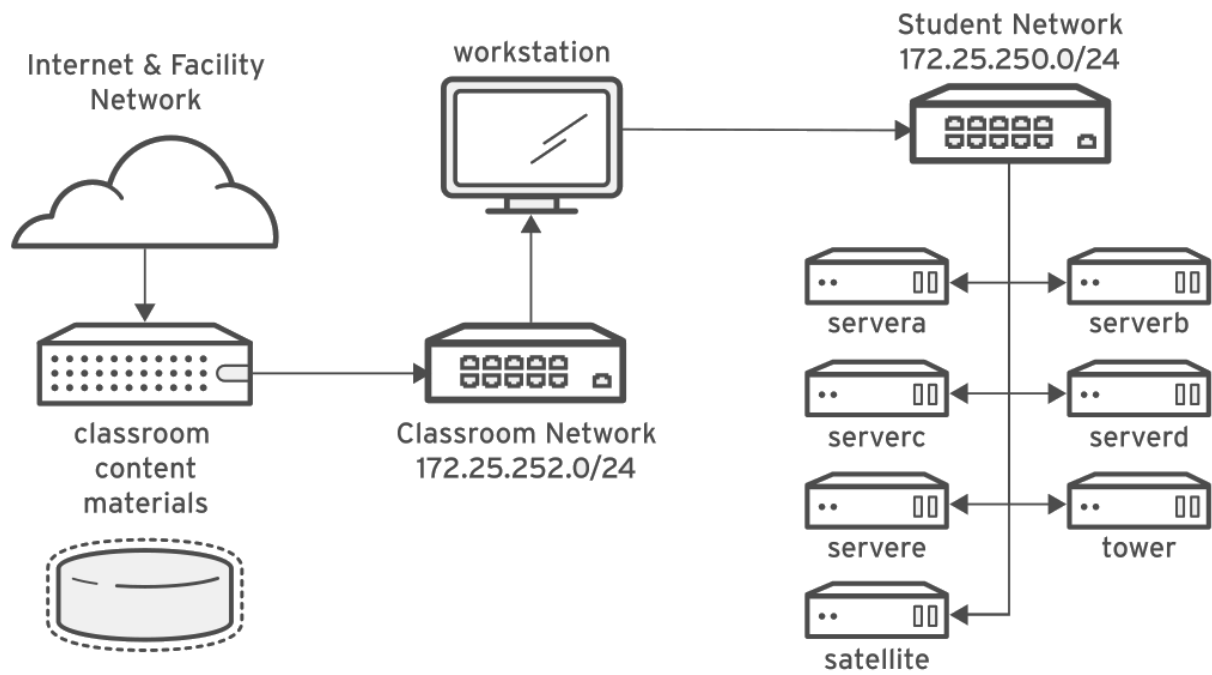


Figure 1. Classroom Environment Layout

There are eight systems used to comprise the entire classroom environment (in addition to **Workstation**). The listing of machines are:

- servera
- serverb
- serverc
- serverd
- servere
- satellite
- tower

Table 1. Security Classroom Layout and Information

Machine Name	IP Address	Role
<code>servera.lab.example.com</code>	172.25.250.10	Managed Server "A"
<code>serverb.lab.example.com</code>	172.25.250.11	Managed Server "B"
<code>serverc.lab.example.com</code>	172.25.250.12	Managed Server "C"
<code>serverd.lab.example.com</code>	172.25.250.13	Managed Server "D"
<code>servere.lab.example.com</code>	172.25.250.16	Managed Server "E"
<code>satellite.lab.example.net</code>	172.25.250.15	Red Hat Satellite 6 Server
<code>tower.lab.example.net</code>	172.25.250.14	Red Hat Ansible Tower server
<code>workstation.lab.example.com</code> / <code>workstation0.example.com</code>	172.25.250.254 / 172.25.252.250	Graphical Workstation as Student Desktop
<code>classroom.example.com</code>	172.25.254.254 / 172.25.252.254 / 172.25.253.254	Classroom utility server
<code>foundation0.ilt.example.com</code> / <code>foundationX.ilt.example.com</code>	172.25.254.250 / 172.25.253.250 / 172.25.254.X	Physical System



The **classroom** server acts as a NAT router for the classroom network. It provides DNS, DHCP, HTTP, and other services. It is also known by **content.example.com** and **materials.example.com**.

Classroom Credentials

System(s)	Username	Password
Student Systems (regular user)	student	student
Student Systems (Root user)	root	redhat
Satellite	admin	redhat
Ansible Tower	admin	redhat



The setup scripts are meant to catch up labs between chapters. It should be noted that labs are meant to be successive for this course.



The Workstation VM must be the first machine powered on. After workstation is up, the Satellite machine should be powered on before any of the other machines. After Workstation and Satellite have both been powered on and running, it is safe to start all other VMs with **rht-vmctl start all** command.



Grading/Setup scripts located <http://content/courses/rh415/rhel7.5/grading-scripts/>. The Ansible playbooks are located at <http://content/courses/rh415/rhel7.5/infrastructure/>. Overall classroom files are <http://content/courses/rh415/rhel7.5/>.

Accessing the System Externally

If using a Macbook or another system on the classroom network, it will be assigned an IP address. The way to access workstation is with the **172.25.252.X** IP address. Once on workstation, you can get to other systems. The other method is to access **FoundationX** directly, which can be done with the **172.25.254.X** IP address.



For a Mac/Linux system, you can use "sudo route -n add/delete 172.25.0.0/16" with a gateway of **172.25.254.254** to route traffic across multiple interfaces.



The **Foundation0** system IP address **172.25.254.250** is the instructor system.



Grading scripts get downloaded locally to **/usr/local/lib** and several executables for the environment also live in **/usr/local/bin/lab**



To preserve system resources, the **Satellite** and **Tower** VMs can be turned except when they are needed to be used in Chapter 8.

Accessing FoundationX VMs from Foundation0

With the exception of **WorkstationX**, VMs running on **FoundationX** cannot be accessed directly from **Foundation0**. In order to make items more efficient, a set of Ansible playbooks and resource files has been created to allow accessing VMs running on **FoundationX** remotely from Foundation0 by setting up port forwarding on **WorkstationX**.

Table 2. Accessing Systems Remotely

Machine Name	IP Port
servera	122
serverb	222
serverc	322
serverd	422
servere	522
satellite	722
tower	622

1. Gaining Remote Access

Objectives

- Install Ansible
- Enable Remote Access

In order to access the systems remotely and gain remote access, it is necessary to setup and configure **Firewalld** to perform port forwarding, masquerading, and NAT from the **WorkstationX** machine.

A set of Ansible playbooks and resource files has been created to configure the **Foundation0** system with the Kiosk user remote access to all VMs hosted on **FoundationX** systems. These playbooks will also configure **WorkstationX** systems with port forwarding to the various **FoundationX** hosted VMs.

The Ansible playbook **DeploySSH.yml** will copy the **config** file as the **/home/kiosk/.ssh/config** file to setup the names so that it is possible to SSH to a system using **server[a-e]X**, where **X** is the number corresponding to the foundation that the system is running on. The playbook also copies the **hosts** file to **/etc/hosts** which sets up the names of the VMs running on FoundationX so that they are resolvable via DNS to work with the SSH **config** file.

The Ansible playbook **WorkstationFW.yml** will copy the **/Ansible/resource_files/workstation_external.xml** to **/etc/firewalld/zones/external.xml** file and reload the FirewallD rules. This will allow the port forwarding to be setup.

After running both playbooks, it will be possible to SSH directly to a system. The **inventory** file is setup so that **Workstation** will cover all workstationX systems and **Foundation** will cover all foundationX systems. In order to use Ansible with Foundation0, it is configured with a group called **Instructor**.

1.1. Setting Up Ansible on Foundation0

Ansible is already available from **Foundation0** and can be installed by the root user. The **RH415_Ansible.tgz** file contains the following files/Directories:

RH415_Ansible.tgz

- **/Ansible**
- **/Ansible/ansible.cfg**
- **/Ansible/inventory**
- **/Ansible/DeploySSH.yml**
- **/Ansible/WorkstationFW.yml**
- **/Ansible/resource_files**
- **/Ansible/resource_files/config**
- **/Ansible/resource_files/hosts**
- **/Ansible/resource_files/workstation_external.xml**

The **tar** file can be downloaded and extracted as the **kiosk** user and it will automatically created the **Ansible/** directory with the correct hierarchy. The **ansible.cfg** and the **inventory** file has been setup and configured so that it will run everything as root

based on the **Foundation0** RHT training key being distributed to all systems.

1.1.1. Getting Files and Preparing Foundation0 Kiosk User

Currently, the files can be obtained from <http://people.redhat.com/~tmichett/RH415>. There is the PDF version of this guide as well as the **RH415_Ansible.tgz** file containing all files needed for Ansible. Eventually, the files will be moved to an Instructor area in RHLC, a location in MOJO, or hopefully our own GitHub/Gitlab location for projects.

1. Place the **RH415_Ansible.tgz** in the Kiosk Home Directory

Listing 1. Verifying File is in Correct Directory

```
[kiosk@foundation0 ~]$ pwd
/home/kiosk
[kiosk@foundation0 ~]$ ls *.tgz
RH415_Ansible.tgz
[kiosk@foundation0 ~]$
```

2. Extract the File(s)/Folder(s) to Kiosk Home Directory

Listing 2. Extraction and Verification of Files

```
[kiosk@foundation0 ~]$ tar -xvf RH415_Ansible.tgz
Ansible/
Ansible/resource_files/
Ansible/resource_files/hosts
Ansible/resource_files/workstation16_external.xml
Ansible/resource_files/workstation17_external.xml
Ansible/resource_files/config
Ansible/resource_files/workstation_external.xml
Ansible/DeploySSH.yml
Ansible/WorkstationFW.yml
Ansible/inventory
Ansible/ansible.cfg

[kiosk@foundation0 ~]$ ls -alRF Ansible/
Ansible/:
total 20
drwxrwxr-x. 3 kiosk kiosk 110 Aug 8 15:44 ./
drwx----- 19 kiosk kiosk 4096 Aug 9 12:08 ../
-rw-r--r--. 1 kiosk kiosk 186 Aug 6 10:54 ansible.cfg
-rw-r--r--. 1 kiosk kiosk 259 Aug 8 09:28 DeploySSH.yml
-rw-r--r--. 1 kiosk kiosk 497 Aug 7 04:13 inventory
drwxrwxr-x. 2 kiosk kiosk 133 Aug 8 08:39 resource_files/
-rw-r--r--. 1 kiosk kiosk 265 Aug 8 09:27 WorkstationFW.yml

Ansible/resource_files:
total 20
drwxrwxr-x. 2 kiosk kiosk 133 Aug 8 08:39 ./
drwxrwxr-x. 3 kiosk kiosk 110 Aug 8 15:44 ../
-rw-r--r--. 1 kiosk kiosk 1225 Aug 8 08:39 config
-rw-r--r--. 1 kiosk kiosk 2102 Aug 8 04:11 hosts
-rw-r--r--. 1 kiosk kiosk 886 Aug 6 12:38 workstation16_external.xml
-rw-r--r--. 1 kiosk kiosk 886 Aug 6 12:38 workstation17_external.xml
-rw-r--r--. 1 kiosk kiosk 872 Aug 8 04:02 workstation_external.xml
```

1.1.2. Installing Ansible on Foundation

In order to use Ansible on **Foundation0** it must first be installed. As the Kiosk user is not configured to perform **sudo** it is necessary to **su -** to get to root in order to perform the installation.

1. Switch to the **root** user using "**su -**".

Listing 3. Becoming the Root User

```
[kiosk@foundation0 ~]$ su -  
Password:  
Last login: Thu Nov  8 13:50:04 EST 2018 on pts/1  
[root@foundation0 ~]#
```

2. Perform a "**yum install ansible**" to Install Ansible Packages

Listing 4. Install Ansible

```
[root@foundation0 ~]# yum install ansible
```



This may not work depending on your specific configuration as **Ansible** may not be available. This has been tested with the latest Foundation 7.6 release.

1.2. Configuring Foundation0

1.3. Configuring WorkstationX