



Introduction to RHA DIY Labs

Purpose

This introduction provides some background on the lab environment utilized by Red Hat Training, the Universal Classroom Foundation (UCF). In addition to the background information, we will review the alternate paths some academies have taken. Full-featured lab environments are necessary for students (and instructors) to succeed with our curriculum.

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Overview of lab options

As a Red Hat Academy (RHA), you can work with a training partner who can provide access to the lab environment as part of an existing relationship or as a per pupil cost. You can also use the bits that we provide to our commercial Red Hat Certified Instructors (RHCIs) and do-it-yourself.

Private Partner

If you have an existing relationship with a training vendor/partner to provide lab environments on local hardware for other IT academic programs, you may be able to have that vendor/partner add the Red Hat Training lab environment on that same platform. Reach out to your Red Hat Academy liaison for vendor/partner information. Lab partners include NDG NetLab+.

Cloud Partner

This deployment typically defines a fee per user for a specified duration of access to the lab environment hosted online in the cloud by one of our partners. Reach out to your Red Hat Academy liaison for partner information. Lab partners include NDG Online and Infosec Learning.

Red Hat Online Learning Environment (OLE)

Red Hat hosts the lab environment in our commercial business for virtual training (VT) and self-paced training in the Online Learning Environment (OLE). The lab environment, in the form of Video Classroom content, is made available to RHA instructors to upskill and to review how another instructor approaches delivery of the content. This modality is offered for a select few of the current RHA courses via the RHA Learning Platform, however, this may be extended to additional courses in the future.

Do-It-Yourself (DIY)

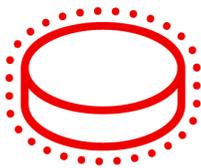
With the same bits used by Red Hat Certified Instructors at the beginning of each in-person ILT (Instructor-Led Training) session, you can deploy a local environment. Later in this guide we will look at some options necessary for the unique delivery model that RHA offers.

Red Hat Training Hands-on Lab Environment

Red Hat Training focuses on technical enablement through hands-on learning. Each course includes a lab environment where students will perform activities related to the topics being covered.

Classroom Lab Environment (CLE)

Students will perform their work on a number of virtual machines. The exact names and functions of these virtual machines will vary depending on the course. The standard virtual machines are:



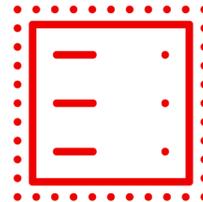
CLASSROOM

Content distribution server/virtual machine controlled by the instructor or curriculum developers.



WORKSTATION

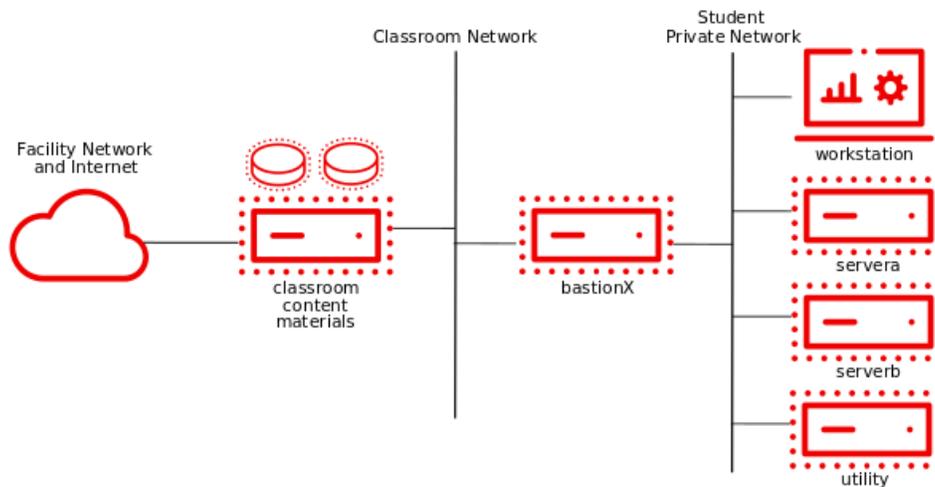
Graphical desktop used by students/instructor. Primary virtual machine for all lab activities.



SERVER(S)

One or more virtual machines “managed” by students/instructor as part of lab activities. Names may vary.

As an example, the below diagram shows the set of virtual machines (VMs) for one student taking a course in support of Red Hat Certified System Administrator (RHCSA) and how the VMs are connected to networks. This diagram mirrors one found at the beginning of each course.

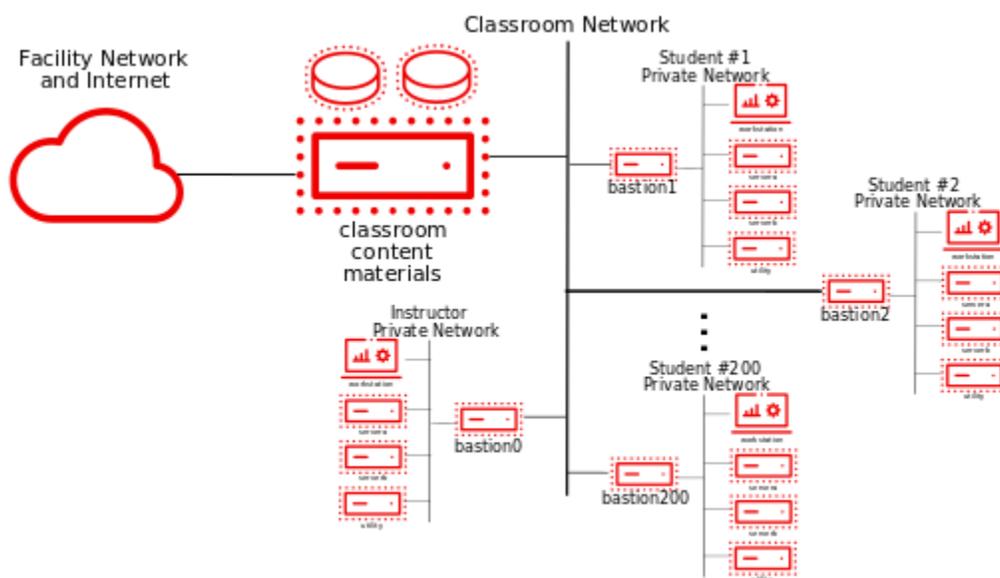


Each student will have a private network connecting all of their personal VMs. Some courses may include additional private networks for each student.

The hands-on lab activities, in the form of Guided Exercises and Unit Labs, begin with the student opening a graphical console to the workstation VM. Typically the student will run a provided script that may adjust the environment in preparation for performing the activity. That script may download artifacts from the classroom VM using the hostnames of classroom, content, and/or materials. Those artifacts and configurations may adjust the workstation VM and/or the other server VMs.

Students can individually work on any lab activity within a course, but the classroom VM is generally locked to the course being serviced, one set of artifacts at a time. Students do not have login credentials for the classroom VM as that is managed by the instructor. Instructors can control (turn on and off) access to the facility network and the Internet from the classroom VM. Note that some courses will require access to resources on the Internet.

The bastion VM was introduced in CLEv3 to separate the student private network from the classroom network. Student VMs are configured to point to the bastion VM as the default gateway/router and DNS server. Lab activities do not require students to log in to the bastion VM, but it must be running to provide access to the classroom VM (and the Internet) and to perform any activities.



The above diagram depicts how the instructor and a number of students would be accommodated. Note that each student and the instructor have their own VMs connected on their own private networks, but they share access to the classroom network and VM. Also, note that each is assigned a number with the instructor being zero and students ranging from one to two hundred in a single class with each bastion VM having a corresponding name and unique

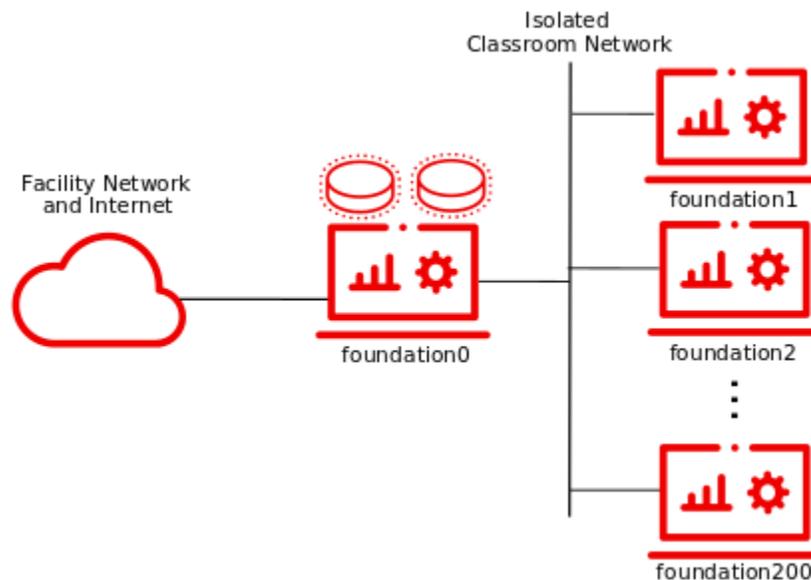
address. Instructors are provided ssh keys that can use this path to access a given student's VMs to provide additional help or evaluate performance.

RHClfoundation

To run the virtual machines in an in-person, instructor-led-training (ILT), classroom setting, we deploy Red Hat Enterprise Linux on physical systems with RHClfoundation.

In essence, before class begins, an instructor installs foundation0, which is the instructor system, copying all the content needed to deploy student systems along with all the CLE content for a particular course offering (lab materials, VM images). Once that foundation0 system is configured, the instructor can push installs out to one or more student physical systems. Procedures and scripts are provided to automate much of the activity, including things like changing from the default US keyboard when taught globally.

One caveat is that the physical classroom network should be isolated from the facility as RHClfoundation deploys services like DHCP which could impact the facility network. To provide external access, it is assumed that the foundation0 physical system has two network interface cards (NICs) with one connected to the isolated, private classroom network and the other connected to the facility network. The instructor then has scripts to control turning on and off external access by enabling/disabling the second NIC. Some courses require internet access to retrieve certain materials.



A second caveat is that the default installation of foundation0 is to be the only operating system with the physical system dedicated to the class for the duration of the class. However, there is an opportunity to have foundation0 share the local drive by having it in its own bootable partition using an option called dualboot. The local hard drive would need to be large enough to

accommodate both operating systems and their corresponding content. Also, for students to perform their work on their own foundationX system, the instructor foundation0 would need to be booted and network accessible.

There is a document hosted on redhat.com that shows the hardware requirements for all of our courses at:

<http://www.redhat.com/en/resources/red-hat-training-and-certification-classroom-requirements>

This document identifies the size of hard drives and internet connectivity requirements along with other useful information.

Online Learning Environment (OLE)

Red Hat designed a learning platform that hosts the content (book) and lab environments. For the labs, it instantiates a distinct, complete classroom environment for each individual student. Each student has their own set of VMs including a private classroom VM in a stack.

To support the direct running of these VMs for each student, Red Hat currently deploys the VMs on Red Hat OpenStack Platform, having configured the OpenStack SDN (Software Defined Networking) for secure, private execution of the thousands of environments.

Labs Deployment in Red Hat Training (ILT)

Red Hat Training delivers in-person training by installing RHCIfoundation and course materials on private, physical hardware. Traditionally, in week-long deliveries, the instructor arrives early the first morning and wipes the contents of the hard drives on the systems in preparation for deploying the Universal Classroom Foundation (UCF) of RHCIfoundation and Classroom Lab Environment (CLE). At the end of class, the instructor wipes the hard drives to make it easier for the class being held the following week.

There are scripts and processes to aid in both the deployment and clean up of a classroom. The processes are outlined in a set of files named: `ClassPrep-*.txt`, `ClassRHAPrep-*.txt`, `ClassroomSetup-*.txt`, `ClassroomReset-*.txt`, and `ClassroomTroubleshooting-*.txt`. As these documents evolve, they are versioned as part of their names.

Commercial instructors use a facility called Instructor Central to download all the bits needed to perform a live course delivery. The manifests and artifacts are downloaded to a local repository using either a webUI or a command line tool called `icrm` (Instructor Central Resource Manager).

A manifest (`.icmf` - Instructor Central Manifest File) contains the list of artifacts (or files) that are needed for a particular course along with checksums for integrity testing and additional instructions for where/how those files should be deployed. The RHCIfoundation manifest includes the files needed to deploy physical systems, while an RH124 manifest includes the files for the CLE of the RH124: Red Hat System Administration I course. The RHCIfoundation manifest includes the `Class*.txt` documentation files mentioned above.

Once downloaded, instructors are expected to build a removable USB device (flash drive or other media) using a tool called `rht-usb` that is included with the RHCIfoundation artifacts. This tool is a Python script that should be run on a RHEL or Fedora system. The creation of the USB device is documented in `ClassPrep-*.txt`. That USB device is used to deploy that first foundation0 instructor system as described in `ClassroomSetup-*.txt`.

As a shortcut for academies, the RHALP download area has instead provided pre-built USB images where the RHCIfoundation manifest and one or more courses are already on that `.img` file. The `.img` file name contains information about its contents. For example, `usb-8.2-24G-rhcsa8.2-r2021092316.img` translates to:

- 8.2 - installs RHCIfoundation using RHEL 8.2 (physical)
- 24G - target USB device must be at least 24G in size
- rhcsa8.2 - contains the RHCSAv8.2 courses (RH124v8.2 and RH134v8.2)
- 2021092316 - built on that date `yyyymmddhh`

Additionally, in that same download area, there is a corresponding `rhci-foundation-*.iso`, `ClassRHAPrep-*.txt`, `ClassroomSetup-*.txt`, `ClassroomTroubleshooting-*.txt`. The `.txt` files are providing documentation while the `.iso` is an alternate bootstrap if you cannot boot from the USB image.

From the RHALP interface, choose Access Resources:

Red Hat Academy Resources

Manage Classes

Access Resources

View Courses and Certifications

Get Trained and Certified

Give Feedback

Get Support

Red Hat Academy Version 1.31

Promote on Social Media

- Promotional Video: Red Hat Academy introduction and benefits
- Image Gallery: Red Hat Academy logo and infographic files

Downloads & Print

- 2020 Courses: Red Hat Academy courses brochure
- Instructor Guides: PDF downloads for courses offered
- Student Resources: Links and downloads to share with your students

Lab Images

- Download Lab Images: Download lab files
- Dual Boot: Download lab files
- Installation and Troubleshooting Guides: Download lab files

Then choose Download Lab Images:

Red Hat Academy

rhcl-foundation-8.2-7r2021091721g1tdf1011a.iso

rhcl-foundation-8.4-7r2021091721g1tdf1011a.iso

usb-7.3-12G-rhce-r52870.img

usb-7.3-16G-osp10-r52870.img

usb-7.3-24G-doi80-r52870.img

usb-7.5-16G-rhce-r201901119.img

usb-8.0-20G-rhce8-r2019061318.img

usb-8.2-24G-rhcsa8.2-r2021092316.img

usb-8.2-40G-rhce8-r2021020415.img

usb-8.2-80G-openstack16.1-r2021062418.img

usb-8.4-32G-rhce8.4-r2021092013.img

Red Hat

Privacy Policy

Red Hat Training Policies

Terms of Use

All policies and guidelines

Then choose the various files to download. Note the .img files are the size in their name (24G, 80G, 32G, etc.) so may take substantial time to download. The supporting .iso and .txt files are much smaller. A listing of which files go with which .img file can be found in the Appendix of this document. Also, verify the MD5 checksum of the file using the value found in the Appendix:

MacOS: md5 usb-8.2-24G-rhcsa8.2-r2021092316.img

Windows: certutil -hashfile usb-8.2-24G-rhcsa8.2-r2021092316.img MD5

Linux: md5sum usb-8.2-24G-rhcsa8.2-r2021092316.img

The expectation is to write this .img file onto a removable USB device, overwriting that flash drive, The process is described in ClassRHAPrep-*.txt. These usb images are legacy bios bootable, but if the system cannot boot from it (for example, is UEFI-only), you can obtain the matching rhci-foundation-*.iso and boot from that optical media, perhaps with an external optical drive (CD/DVD). And, just like the commercial side, directions for using the USB device to deploy the classroom can be found in ClassroomSetup-*.txt.

With the boot media in hand (either just the USB or USB coupled with CD), the instructor would boot their instructor system with that media. Once the instructor system is installed and configured, the instructor goes around and boots the student systems from the network (using PXE) to install and configure. Lastly, once the student systems have finished installing, there is a little more configuration push of content from the instructor system out to the students systems and the class is ready to begin.

All of this is described in the ClassroomSetup-*.txt file in both a “short” or checklist form at the beginning of the document, and a more detailed description of each step later in the document. One checklist is excerpted here as an example (though you should follow the corresponding ClassroomSetup-*.txt file that matches your .img file):

Install RHEL on instructor system:

1. Place the rhci-foundation CD *and* RHTINST USB device into the instructor machine and boot (or boot from bootable USB device).

```
THIS DISC IS FOR USE BY AUTHORIZED RED HAT INSTRUCTORS ONLY.
Version: rhci-foundation-8.2-7.r2020050412git4b1d7b1

USB installs: Make sure your USB drive is inserted
  f0      - Install a new instructor server from scratch (pass the
           course code as an argument, e.g. f0 rh124, or
           for older version, e.g. f0 rh124-rhel63).
  exam    - Install a new exam server from scratch.
  fX      - Install a new student workstation (replace the X with
           the student number, e.g. f12).

Network installs: Make sure your foundation0 is accessible
  pxe     - PXE boot from foundation0 to launch menu (needed when
           PXE is unavailable from NIC directly).
DANGEROUS OPTIONS: Make sure your USB drive is inserted
  destroy - Removes LUM info across *ALL* attached drives.
           Removes partition info on all drives except RHTINST USB.

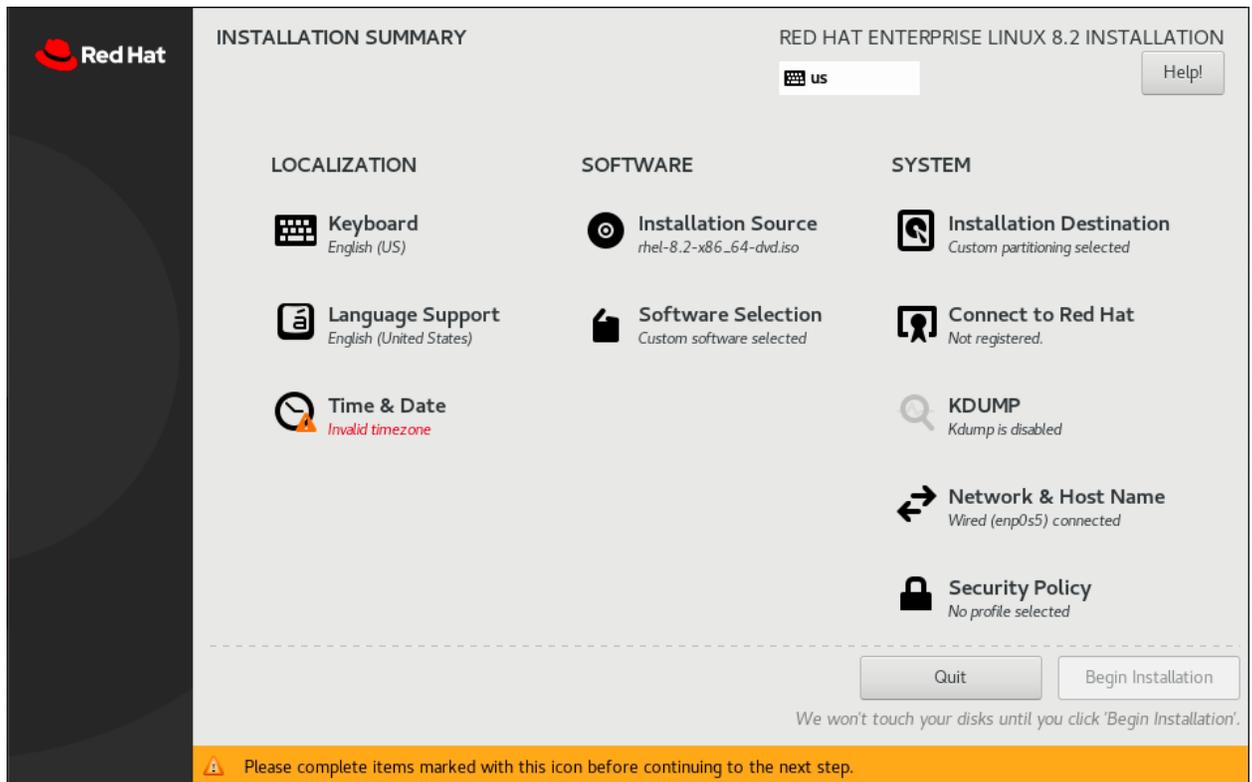
- Or press the <ENTER> key for a menu of student foundations.

boot: _
```

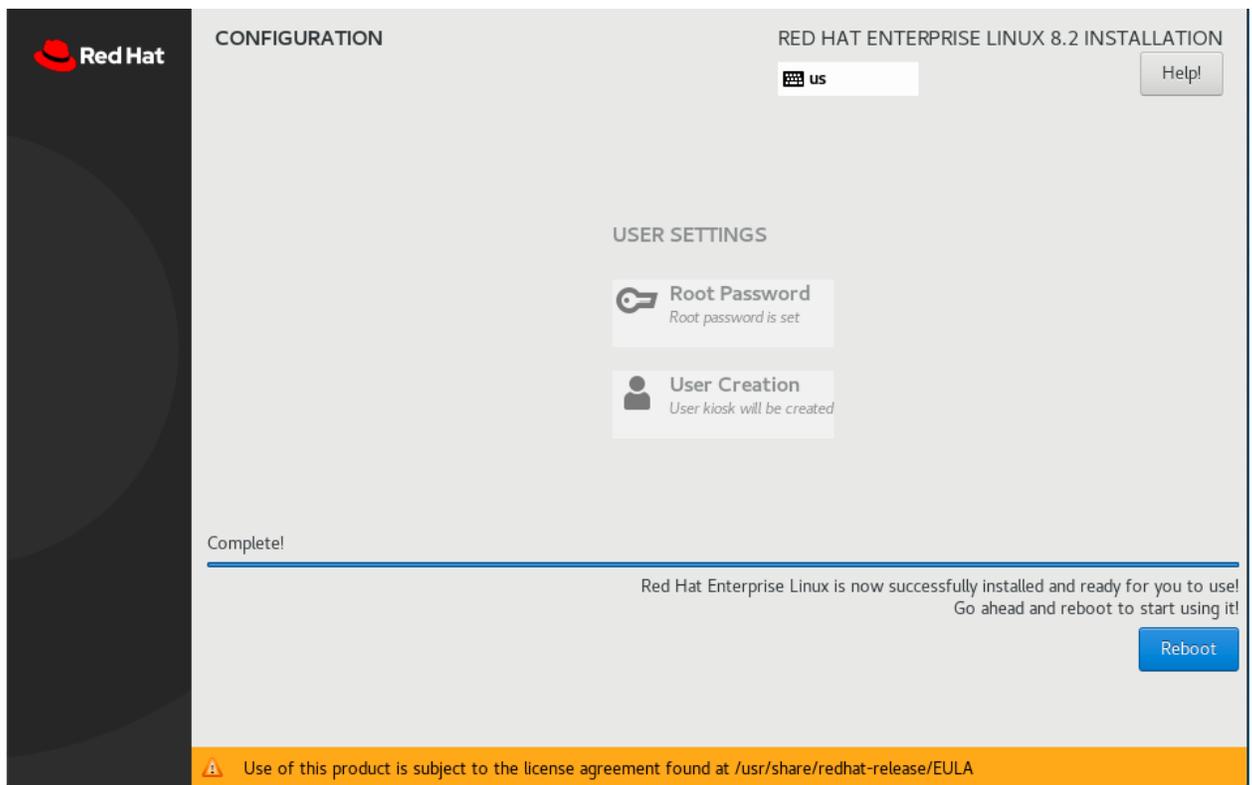
Type "f0 <coursecode>" at the rhci-foundation boot prompt:

```
boot: f0 rh124
```

2. Answer dialog on Timezone, then click Begin Installation.



3. Once the system has finished installing, reboot and remove the USB/CD.
(WARNING - Do not remove the USB until install/shutdown is complete!)



Verify RHEL is installed and configured:

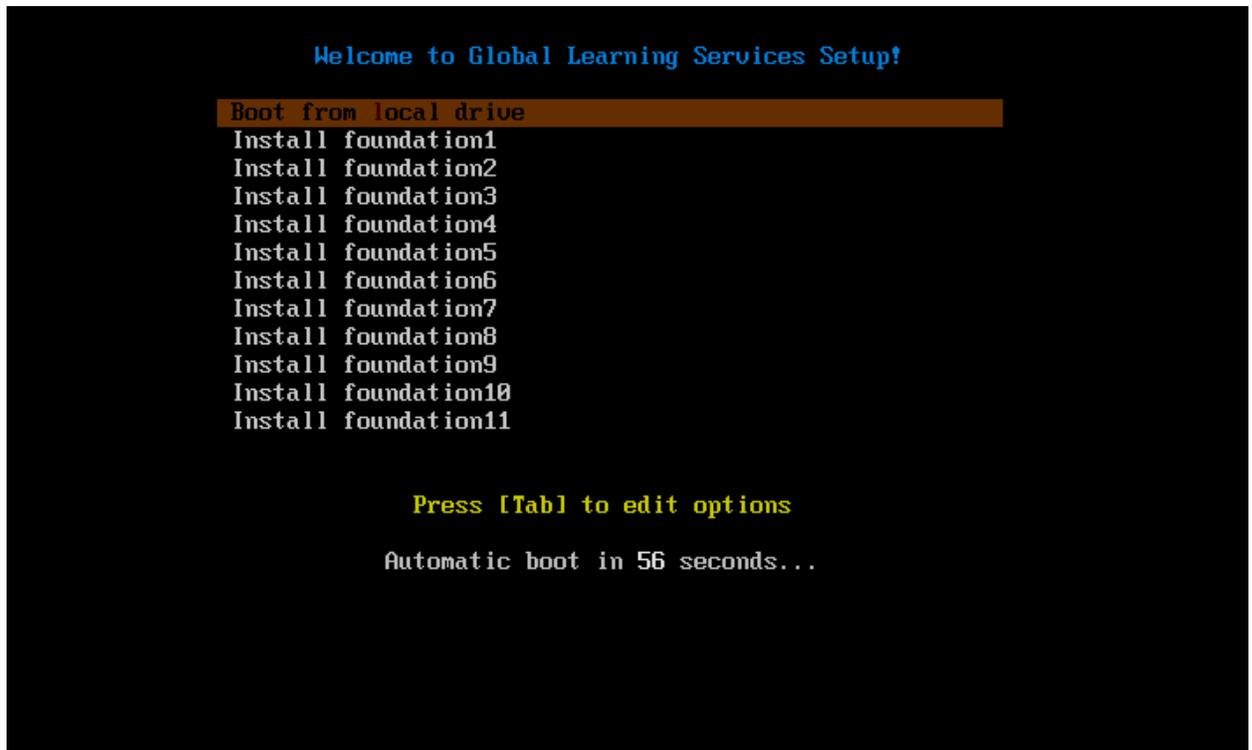
4. Log in as kiosk on foundation0.
5. Correct/verify local time on foundation0.
6. Test that foundation0 services are configured and running:

```
f0$ rht-verify-f0
```

(NOTE: See longer version if no course is present)

Install student systems:

7. Kickstart student workstations choosing appropriate "fX" menu item.



8. Once all fX systems have rebooted, push the course variable and images:

```
f0$ rht-pushcourse all
```

9. Verify that student VMs were delivered (re-run until all complete):

```
f0$ rht-showstate all
```

```
f7 : 2021-09-12 08:31:41 Completed rht-vmctl get all
```

Launch instructor virtual machine(s):

10. Start VMs on f0 (optionally secure and/or set keyboard):

```
f0$ rht-f0finish [--keyboard KEYBOARD] [--secure]
```

11. Verify services on classroom VM, check output from above running of rht-verify-classroom inside rht-f0finish

12. (optional) Connect to the outside world.

```
f0$ rht-external --configure IFACE
```

Begin class:

13. Access/display slides

Slides are deposited in /content/slides/ on f0 or classroom VM

14. Students automatically log in to their foundationX

15. (optional) Secure (or unsecure) the foundationX systems
f0\$ rht-secure-fX all
16. (optional) Class Exercise: Adjust and preserve localization in VMs
fX\$ rht-vmsetkeyboard all us

When looking to reboot your classroom (perhaps after having shutdown the night before), be sure to follow this same basic flow so that needed services are available.

17. Boot foundation0 first and check that services are running.
f0\$ rht-verify-f0
18. Verify services on classroom VM, as instructor:
f0\$ ssh root@classroom.example.com rht-verify-classroom
19. Boot the various student foundationX machines (or let them boot them)
20. Students can then start as needed their VMs

RHA DIY Implementation Alternatives

Given the nature of RHA deliveries being spread out over multiple weeks compared to the commercial deliveries, there are some alternative approaches to deploying the DIY Labs.

Dual boot (shared ILT)

If a classroom of computers has sufficient disk space to hold both the UCF content and the other course content, we can deploy UCF in a dual boot configuration. The idea would be to boot all the computers from their UCF install when doing RHA class work, but have the computers booted to the other operating system (typically Microsoft Windows) for performing other course work.

If you want to support a dual boot environment in the classroom, you should install the other operating system first and shrink the disk usage to provide for at least 100GiB of free/unpartitioned space on the local hard drive. Some classes will require even more free disk space for the number of isos/VM images. Refer to the above Hardware Requirements doc to identify the amount of disk space that should be available to the installation of Red Hat Enterprise Linux for the Red Hat classroom

When installing foundation0, you would use the appropriate keystrokes to add an argument to the installation called "dualboot" and the system will no longer wipe the existing non-Linux partitions. **Currently, the other operating system cannot be another Linux.** For example, from the above Step 1, at the rhci-foundation boot prompt:

```
boot: f0 rh124 dualboot
```

When installing foundationX via PXE, you will want to first use the utility named rht-dualboot on foundation0 to adjust the arguments of the PXE menu to default to dualboot or not.

```
f0$ rht-dualboot on
```

will turn on dualboot by default for all foundationX systems installed via PXE. The argument "off" will disable this default while the argument "status" will report the current default.

Standalone virtual machine image (student personal workstation)

Another option is to create a large virtual machine of the whole UCF stack. This would require the virtualization platform and underlying hardware to support nested virtualization. In effect, install a hybrid foundation0/foundation1 as a virtual machine placing the CLE content inside that virtual machine. The CLE virtual machines would be nested and running inside the hybrid RHCI/foundation virtual machine. The hybrid solution is single user, a single student.

How large a virtual machine is needed? That goes back to the Hardware Requirements document linked to above. The one difference is that the virtual machine would be configured with just one virtual NIC. This virtual NIC would be configured to connect through the host and be NATed to the outside world - the external NIC in the above diagrams.

Begin this process by defining a virtual machine with a large, blank virtual disk (sparsified configuration encouraged), a single NIC, sufficient CPUs, and sufficient RAM. Attach both the .iso file and .img file to the virtual machine and boot from the .iso. The installation process for this configuration is quite similar to the above description, but “f0” is replaced with “standalone”. For example, from the above Step 1, at the rhci-foundation boot prompt:

```
boot: standalone rh124
```

Disconnect the .img file and .iso file from the virtual machine as it reboots in the above Step 3. Since there are no additional students, steps 7-9 above would not apply. You are also encouraged to make use of the `--secure` option on `rht-f0finish` (above step 10) to change the administrative default password to something simple like “redhat” or to something else that you are sharing with the students. Additionally, turn on external access for the VMs in the above step 12 by passing whatever the NIC inside the foundation0 virtual machine is called. Again with no additional student systems, steps 13-16 above do not apply.

With the hybrid/standalone RHCIfoundation virtual machine configured, you could shut it down and distribute the resulting virtual machine disk image (and configuration) to be used by the various students on their own systems presuming sufficient resources. You may want to teach the students about the above steps 17 and 18 for them to verify their virtual machine is operational. You should also review the steps in the introduction of the course material that talk about using `rht-vmctl` and `rht-vmview` to manage and access the nested CLE virtual machines.

Hosted virtual environment (centralized availability with remote access)

There are two approaches to establish your own centralized online environment on a private cloud environment. One is to take the standalone virtual machine image described above and run multiple instances of it, one for each student. The second is to try to replicate the RHCIfoundation configuration and place a set of CLE virtual machines on the platform for each student.

Red Hat would encourage most academies to take the first approach. If an academy is interested in doing the second approach, please reach out to us as we can try to help describe all the pitfalls that we have seen other academies fall into.

Running either approach inside a public cloud vendor will likely be expensive for the academy. While we have been successful in prototyping the first approach in a public cloud, the hourly charge was high given the resource requirements. We have been generally unsuccessful in replicating the RHCIfoundation configuration in public clouds usually due to network configuration constraints.

Appendix A: Current List of Download Materials

All of the files for DIY are combined together into a single folder on RHALP. This can create some confusion of which .iso or .txt files go with which .img. This listing attempts to group them for academies. It also reflects the MD5 checksum of the large .img file. To verify the checksum, after downloading, depending on platform, run:

MacOS: md5 <filename>.img

Windows: certutil -hashfile <filename>.img MD5

Linux: md5sum <filename>.img

Latest/Current Courses:

usb-9.0-33G-rhcsa9.0-2022053122.img (current)

md5sum: a4576b418664f52f6ccb40f7590475d7

This USB image provides the following manifests:

manifest: #1m RH124-RHEL9.0-1.r2022052510-ILT+RAV-7-en_US.icmf

manifest: #2m RH134-RHEL9.0-1.r2022052510-ILT+RAV-7-en_US.icmf

manifest: #3m RHCIfoundation-RHEL90-7.r2022052321-ILT-7-en_US.icmf

Download these additional support files with this image:

rhci-foundation-9.0-7.r2022052019gitbb20f8e.iso

ClassRHAPrep-9.x-7.r2022052321gitea1d58c.txt

ClassPrep-9.x-7.r2022052321gitea1d58c.txt

ClassroomReset-9.x-7.r2022052321gitea1d58c.txt

ClassroomSetup-9.x-7.r2022052321gitea1d58c.txt

ClassroomTroubleshooting-9.x-7.r2022052321gitea1d58c.txt

usb-8.2-24G-rhcsa8.2-2021092316.img (current)

md5sum: 6ddff64e51ae03c038af6c5162c48664

This USB image provides the following manifests:

manifest: #1m RH124-RHEL8.2-1.r2021092209-ILT+RAV-7-en_US.icmf

manifest: #2m RH134-RHEL8.2-1.r2021092209-ILT+RAV-7-en_US.icmf

manifest: #3m RHCIfoundation-RHEL82-7.r2021091721-ILT-7-en_US.icmf

Download these additional support files with this image:

rhci-foundation-8.2-7.r2021091721gitdf1011a.iso

ClassRHAPrep-8.x-7.r2021091721git741ff8d.txt

ClassPrep-8.x-7.r2021091721git741ff8d.txt

ClassroomReset-8.x-7.r2021091721git741ff8d.txt

ClassroomSetup-8.x-7.r2021091721git741ff8d.txt

ClassroomTroubleshooting-8.x-7.r2021091721git741ff8d.txt

usb-8.4-32G-rhce8.4-r2021092013.img (current)

md5sum: 8003f428e5ee910492a82c265edac1ba

This USB image provides the following manifests:

manifest: #1m RH294-RHEL8.4-1.r2021082001-ILT+RAV-7-en_US.icmf

manifest: #2m RHCIfoundation-RHEL84-7.r2021091721-ILT-7-en_US.icmf

Download these additional support files with this image:

rhci-foundation-8.4-7.r2021091721gitdf1011a.iso

ClassRHAPrep-8.x-7.r2021091721git741ff8d.txt

ClassPrep-8.x-7.r2021091721git741ff8d.txt

ClassroomReset-8.x-7.r2021091721git741ff8d.txt

ClassroomSetup-8.x-7.r2021091721git741ff8d.txt

ClassroomTroubleshooting-8.x-7.r2021091721git741ff8d.txt

usb-8.2-80G-openstack16.1-r2021062418.img (current)

md5sum: b1e093042526063bb9a5f4290e1714bd

This USB image provides the following manifests:

manifest: #1m CL110-RHOSP16.1-2.r2021042712-ILT+VT+ROLE+RAV-7-en_US.icmf

manifest: #2m RHCIfoundation-RHEL82-7.r2020120812-ILT-7-en_US.icmf

Download these additional support files with this image:

rhci-foundation-8.2-7.r2020120320gitbe9ba2b.iso

ClassRHAPrep-8.x-7.r2020120320gitbe9ba2b.txt

ClassPrep-8.x-7.r2020120320gitbe9ba2b.txt

ClassroomReset-8.x-7.r2020120320gitbe9ba2b.txt

ClassroomSetup-8.x-7.r2020120320gitbe9ba2b.txt

ClassroomTroubleshooting-8.x-7.r2020120320gitbe9ba2b.txt

Historical/Non-current Courses:

usb-8.2-40G-rhce8-r2020120415.img (non-current)

md5sum: cf57965497c628c863d91bea2ea9485b

This USB image provides the following manifests:

- manifest: #1m RH124-RHEL8.2-1.r2020100106-ILT+RAV-7-en_US.icmf
- manifest: #2m RH134-RHEL8.2-1.r2020100106-ILT+RAV-7-en_US.icmf
- manifest: #3m RH294-RHEL8.0-1.r2019062609-ILT+RAV-7-en_US.icmf
- manifest: #4m RHCIfoundation-RHEL82-7.r2020120812-ILT-7-en_US.icmf

Download these additional support files with this image:

- rhci-foundation-8.2-7.r2020120320gitbe9ba2b.iso
- ClassRHAPrep-8.x-7.r2020120320gitbe9ba2b.txt
- ClassPrep-8.x-7.r2020120320gitbe9ba2b.txt
- ClassroomReset-8.x-7.r2020120320gitbe9ba2b.txt
- ClassroomSetup-8.x-7.r2020120320gitbe9ba2b.txt
- ClassroomTroubleshooting-8.x-7.r2020120320gitbe9ba2b.txt

usb-8.0-20G-rhce8-r2019061318.img (non-current)

md5sum: 58713453a0cbaae0f7a2d3a093a64296

This USB image provides the following manifests:

- manifest: #1m RH124-RHEL8.0-1.r2019053010-ILT+RAV-7-en_US.icmf
- manifest: #2m RH134-RHEL8.0-1.r2019053010-ILT+RAV-7-en_US.icmf
- manifest: #3m RH294-RHEL8.0-1.r2019053010-ILT+RAV-7-en_US.icmf
- manifest: #4m RHCIfoundation-RHEL80-7.r2019061318.rha-ILT-7-en_US.icmf

Download these additional support files with this image:

- rhci-foundation-8.0-7.r2019061318gitea6727.iso
- ClassRHAPrep-8.x-7.r2019061318gite4a6727.txt
- ClassPrep-8.x-7.r2019061318gite4a6727.txt
- ClassroomReset-8.x-7.r2019061318gite4a6727.txt
- ClassroomSetup-8.x-7.r2019061318gite4a6727.txt
- ClassroomTroubleshooting-8.x-7.r2019061318gite4a6727.txt

usb-7.5-16G-rhce-r2019011119.img (non-current)

md5sum: 74737d00134648f103a31a4d17347506

This USB image provides the following manifests:

manifest: #1m RH124-RHEL70-3.r52870.2-ILT-7-en_US.icmf

manifest: #2m RH134-RHEL70-3.r52870.4-ILT-7-en_US.icmf

manifest: #3m RH254-RHEL70-3.r52870.2-ILT-7-en_US.icmf

manifest: #4m RHCIfoundation-RHEL75-6.r2018103114-ILT-7-en_US.icmf

Download these additional support files with this image:

rhci-foundation-7.5-6.r2018091915git6c74973.iso

ClassRHAPrep-7.x-6.r2018082011git60b4a23.txt

ClassPrep-7.x-6.r2018082011git60b4a23.txt

ClassroomReset-7.x-6.r2018082011git60b4a23.txt

ClassroomSetup-7.x-6.r2018082011git60b4a23.txt

ClassroomTroubleshooting-7.x-6.r2018082011git60b4a23.txt

usb-7.3-12G-rhce-r52870.img (non-current)

md5sum: da904224975dc83a7e769c894a064f7e

This USB image provides the following manifests:

manifest: #1m RH124-RHEL70-3.r52870-ILT-7-en_US.icmf

manifest: #2m RH134-RHEL70-3.r52870-ILT-7-en_US.icmf

manifest: #3m RH254-RHEL70-3.r52870-ILT-7-en_US.icmf

manifest: #4m RHCIfoundation-RHEL73-5.r2017071218-ILT-7-en_US.icmf

Download these additional support files with this image:

rhci-foundation-7.3-5.r2017071218git8743251.iso

ClassRHAPrep-7.x-5.r2017071218git8743251.txt

ClassPrep-7.x-5.r2017071218git8743251.txt

ClassroomReset-7.x-5.r2017071218git8743251.txt

ClassroomSetup-7.x-5.r2017071218git8743251.txt

ClassroomTroubleshooting-7.x-5.r2017071218git8743251.txt

usb-7.3-16G-osp10-r52870.img (non-current)

md5sum: 84a63af1fbe444a34337f280f4513cb3

This USB image provides the following manifests:

manifest: #1m CL110-RHOSP10.1-1.r2017041019-ILT+VT+ROLE+RAV-7-en_US.icmf

manifest: #2m RHCIfoundation-RHEL73-5.r2017071218-ILT-7-en_US.icmf

Download these additional support files with this image:

rhci-foundation-7.3-5.r2017071218git8743251.iso

ClassRHAPrep-7.x-5.r2017071218git8743251.txt

ClassPrep-7.x-5.r2017071218git8743251.txt

ClassroomReset-7.x-5.r2017071218git8743251.txt

ClassroomSetup-7.x-5.r2017071218git8743251.txt

ClassroomTroubleshooting-7.x-5.r2017071218git8743251.txt

usb-7.3-24G-do180-r52870.img (non-current)

md5sum: 6a75d445798169fd4c3b8e35d6f149dc

This USB image provides the following manifests:

manifest: #1m DO180-OCP3.5-1.r51459.1-ILT+VT+ROLE+RAV-7-en_US.icmf

manifest: #2m RHCIfoundation-RHEL73-5.r2017081515-ILT-7-en_US.icmf

Download these additional support files with this image:

rhci-foundation-7.3-5.r2017071218git8743251.iso

ClassRHAPrep-7.x-5.r2017071218git8743251.txt

ClassPrep-7.x-5.r2017071218git8743251.txt

ClassroomReset-7.x-5.r2017071218git8743251.txt

ClassroomSetup-7.x-5.r2017071218git8743251.txt

ClassroomTroubleshooting-7.x-5.r2017071218git8743251.txt