Red Hat
Training and Certification

Classroom Technology Requirements

Red Hat Training classes and exams are highly interactive and require a properly configured classroom. Instructors use automated classroom installation methods to ensure a consistent and efficient training environment. This document specifies the minimum requirements that a classroom must meet to support a Red Hat Training course, including internet and bandwidth requirements and recommendations for Bring Your Own Device (**BYOD**) users.

Classrooms and personal devices that do not meet these requirements are not supported. **Red Hat is not responsible for any damages resulting from a Client's failure to provide an appropriate physical environment and/or equipment as described below.** Direct any questions regarding these specifications to your Red Hat Training representative.

The Baseline Classroom

The baseline classroom configuration for Red Hat training classes is described in this section. Required adjustments to this baseline to reflect course-specific requirements are detailed in the Course Specific Requirements table of this document.

Classroom Environment

- **Overhead projector with projection screen capable of HD resolution** or better at 2000 ANSI lumens brightness, preferably with HDMI connection. Alternatively, **a large screen (55" or greater) LCD/LED television or monitor** (HD resolution or better) with HDMI connections.
- **Whiteboard or flipchart** for instructor use with appropriate writing materials.
- **Sufficient desk space** so that students can take notes while working with the computers.
- Minimal ambient noise and appropriate temperature control to provide **a comfortable learning environment.**

Computers

Red Hat courses utilize a state of the art lab system that deploys exercises to student systems in an automated fashion. This lab system depends on a consistent environment that matches the following requirements. Each course has a specific required hardware level that aligns with the course requirements. The number of machines per student and instructor may differ by course or exam. See the table "Course Specific Requirements" table below for details.

Level 1	Intel Core i3 CPU with VT support or AMD Phenom X4 / AMD FX-4xxx with AMD-V 8 GB RAM 100 GB HDD on a single disk Screen resolution: 1280x1024 minimum for text only | 1600x1080 for graphical user interfaces Gigabit Ethernet USB2/DVD support (USB3 recommended)
Level 2	Intel Core i5 CPU with VT support or AMD FX-6xxx with AMD-V 8 GB RAM 250 GB HDD on a single disk Screen resolution: 1280x1024 minimum for text only | 1600x1080 for graphical user interfaces Gigabit Ethernet USB2/DVD support (USB3 recommended)
Level 3	Intel Core i5 CPU with 4 cores and VT support or AMD FX-6xxx with AMD-V 16 GB RAM 250 GB HDD on a single disk (SSD recommended) Screen resolution: 1280x1024 minimum for text only | 1600x1080 for graphical user interfaces Gigabit Ethernet USB2/DVD support (USB3 recommended)
Level 4	Intel Core i7 CPU with VMCS shadowing support (Haswell or newer) or AMD FX-6xxx with AMD-V 32 GB RAM 250 GB SSD on a single disk (**SSD required**) Screen resolution: 1600x1080 for graphical user interfaces Gigabit Ethernet USB3 support (boot from USB required)

Fast Facts

- Meeting classroom requirements is critical for successful Red Hat training events.
- Most events use one computer system per person. Exact requirements vary for each course, documented in this guide.
- For Instructor-Led Training (ILT) classrooms, physical computer systems are required. Virtualized desktops or similar virtual machines are not supported.
- In ILT classrooms, the physical computer system's operating system will be installed by the instructor prior to the starting time on the first day of class. This required installation will overwrite the system's disks.
- For Virtual Training (VT or ROL) classrooms, students may use any computer with a supported browser and properly-tested access to the remote Red Hat classroom.

Desktops vs. Servers

Our classes are designed to use typical desktop or laptop hardware. Server hardware is not appropriate for noise, power and configuration reasons. Servers in a data center can not be used because of security, connectivity and liability reasons.

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General Notes

- Systems are installed at the beginning of each class to ensure a consistent environment. A backup is not performed prior to reinstalling, and Red Hat is not responsible for any data loss.
- All student machines used in a course should use identical hardware (required for candidate systems in exam sessions).
- At least one spare system should be available (**required** for exam sessions).
- Physical hardware is required. Third-party virtual machines (e.g., VMware, Citrix) or cloud-based solutions are not supported. Red Hat Training courses and Exams routinely use and/or teach the use of virtual machines in the classroom using the KVM hypervisor included with Red Hat Enterprise Linux. However, the classroom must be hosted on physical hardware in the student's location.
- Red Hat recommends using classroom computer systems that have been **certified by Red Hat**. See https://hardware.redhat.com/ or https://access.redhat.com/ecosystem. When certified hardware is not available, test computer systems by performing an installation of the relevant operating system release, and then confirm proper system, disk, network, and graphics functionality.
- **Hardware must be accessible to the students in the physical classroom.** Hardware in a remote data center and remote desktop access is not supported. Exception: Red Hat Online Learning Environment (OLE) used for Virtual Training and for select classes.
- Red Hat recommends that the classroom computer systems are all attached to an Uninterruptible Power Supply (UPS) for battery backup (strongly encouraged for exam sessions).

Hard Disks

Our classroom environment is optimized for systems with a single disk. SSD drives are recommended as they offer a significant improvement in speed. Additional disks should be disconnected or disabled.

Spare Equipment

Hardware is known to fail on occasion. Every course event should have appropriate minimal quantity of spare computer systems, network switches, cables, and power strips.

Physical System Alternatives

Red Hat offers an appropriately sized Red Hat Mobile Kit directly to the event site in most regions. Red Hat also offers a remote-access, virtualized classroom environment for most courses. Discuss the requirements for these choices with your Red Hat Training representative.

Testing for Virtualization Support

On a system installed with Red Hat Enterprise Linux, you can use the tool **virt-host-validate** to check if virtualization is supported and enabled.

Certified Hardware

Ideally, use Red Hat certified hardware. When not available, perform a test installation of the relevant release and check if network, disk and graphics are functional.

OS Version

The RHEL version noted refers to the operating system installed on the physical computer system, and may not represent the operating systems in the course virtual machines used by students during the course or exams.

WARNING: Skylake processors

RHEL versions 7.2 and older and 6.6 and older are not compatible with the Intel Skylake and later architectures.

BIOS Settings

- Set UEFI machines to "legacy BIOS only." This setting is universally supported, whereas booting "UEFI only" requires disabling Secure Boot, and must be tested with specific hardware.
- Enable network booting (PXE).
- Set hard disks to AHCI (native). Disable RAID arrays.
- If a second hard drive is installed, then deactivate the second drive in the BIOS or disconnect its data cable.
- Check that the “Execute Disable” (XD) CPU feature is available and enabled in the BIOS on all machines. This might be referred to as “Enhanced Virus Protection” (EVP) on AMD systems, or as the “No Execute” (NX) processor flag.
- Enable virtualization support. This is referred to as either "VT" on Intel systems or "AMD-V" on AMD systems.
- Set boot order to CD->Hard Disk->PXE
- Disable all wireless interfaces on student machines. If a second NIC is installed on student machines, then disable it in BIOS or remove it from the system.
- BIOS passwords: Ensure that BIOS settings can be changed by the instructor.

Network

The network configuration for Red Hat training classes is described in this section.

Classroom Network

A **wired** Gigabit Ethernet (1000Mbit) network is required to connect the instructor machine and student machines. This classroom network must be **isolated**, meaning that the network used for systems in this room must not connect to any other networks, servers, or devices outside this physical classroom. Wireless network performance is insufficient, and may not be used for connectivity between student and instructor systems. **Wireless NICs must be removed from student machines for exams** for security reasons.

Network Switch Settings

- Factory default settings usually work best.
- All network ports of the classroom network must be connected to the same VLAN
- Disable all protocol filters. The isolated network deploys DHCP, TFTP, and other protocols that must be unfiltered/unmanaged.
- If Spanning Tree Protocol (STP) is used, then ensure that the ‘Port Fast’ option is enabled on all ports.
- Disable all MAC address filtering and “Port Security” because virtual machine NICs utilize multiple MAC addresses.

Classroom Internet Access

An internet connection is generally required for all courses and exams. A direct, external internet connection is not required, but may instead be routed through facility networking. The second NIC on the Instructor system is used for this internet access, allowing an instructor to control or disable internet access to the Classroom network. Although USB network adapters are insufficient for use on the Classroom network, either wired or wireless USB NIC adapters can be used for the internet uplink as the Instructor system's second NIC. The use of a USB adapter requires manual configuration by the instructor.

Note:

- Certain classes and exams require internet access to complete specific exercises. These courses are indicated in the “***Course & Exam Specific Hardware Requirements***” chart below.

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Note: The following list of courses and exams have some special considerations.

- **The following courses require access to the OpenShift shared cluster.**
  - *Introduction to OpenShift Applications* (DO101 v4.5 & v4.6)
  - *Introduction to Containers, Kubernetes, and Red Hat OpenShift* (DO180 v4.5 & v4.6)
  - *Containers, Kubernetes, and Red Hat OpenShift Administration I* (DO285 v4.5 & v4.6)
  - *Red Hat OpenShift Development I: Containerizing Applications* (DO288 v4.5 & v4.6)
- **The following courses require access to the quay.io and gihub.com domains as well as access to ports 80 and 443:**
  - *Red Hat OpenShift Administration II: Operating a Production Kubernetes Cluster* (DO280)
  - *Containers, Kubernetes, and Red Hat OpenShift Administration II* (DO285)
  - *Red Hat OpenShift Administration III: Scaling Kubernetes Deployments in the Enterprise* (DO380)
  - *Red Hat OpenShift Installation Lab* (DO322)
  - *Building Resilient Microservices with Istio and Red Hat Service Mesh* (DO328)
- **The following courses require access to the *.nextcle.com, github.com, quay.io, docker.io, registry.connect.redhat.com, and registry.redhat.io domains as well as access to ports 80, 443, and 6443:**
  - *Developing Application Business Rules with Red Hat Decision Manager* (AD364)
  - *Introduction to OpenShift Applications* (DO101)
  - *Introduction to Containers, Kubernetes, and Red Hat OpenShift* (DO180)
  - *Red Hat OpenShift Development I: Containerizing Applications* (DO288)
  - *Containers, Kubernetes, and Red Hat OpenShift Development II* (DO295)
  - *Red Hat Cloud-native Microservices Development with Quarkus* (DO378)
  - *Red Hat DevOps Pipelines and Processes: CI/CD with Jenkins, Git, and Test Driven Development (TDD)* (DO400)
- **Red Hat OpenStack Administration II: Infrastructure Configuration for Cloud Administrators (CL210 v16)**
  - This course uses Level 4 hardware otherwise, but requires 64GB RAM to run
- ***Microsoft Windows Automation with Red Hat Ansible* (DO417)**
  - This class requires that Your device must be installed with a *Remote Desktop Protocol* (RDP).
    - If running Microsoft Windows, you should have **Microsoft Remote Desktop** installed.
    - If running macOS, you will need to install **Microsoft Remote Desktop for Mac** (by Microsoft) from the App Store.
    - If running Linux, you may install **Remmina** from their distribution (if available) or following instructions at https://remmina.org (if not). If they prefer, they may instead install the FreeRDP clients from their Linux distribution (in the freerdp package in Red Hat Enterprise Linux).
  - This class requires access to public cloud infrastructure for the classroom lab environment virtual machines (VMs) via TCP port 3389.
- ***Ansible for Network Automation* (DO457)**
  - This class is run with remote VT-based labs only. All deliveries must be provisioned by Red Hat Training Operations in your region prior to the start of class.
- ***Build and Administer APIs with Red Hat 3scale API Management* (AD240)**
  - This class downloads some material from the public internet.
- ***Red Hat Certified Specialist in OpenShift Administration Exam* (EX280 v4.X)**
  - This exam requires the use of cloud based exam systems for OpenShift Container Platform version 4.2 and 4.5
- ***Red Hat Certified Specialist in OpenShift Application Development Exam* (EX288v4.x)**
  - This exam requires the use of cloud based exam systems for OpenShift Container Platform version 4.1, 4.2, and 4.5
- ***Red Hat Certified Specialist in Systems Deployment and Systems Management Exam* (EX403 v66)**
  - This exam requires the use of cloud based exam systems for Red Hat Satellite version 6.6

Note: Red Hat Training & Certification utilizes the internet connection for exam monitoring. If no internet connection is available, please contact your Red Hat Training & Certification representative.

Internet, Bandwidth, & BYOD Specifications:

In general, when a course requires internet access, the facility must provide students with a minimal bandwidth and latency to the Red Hat Online Learning environment and public cloud infrastructure. As a guideline, a facility that runs any vILT course should provide at least 4 Mbps per student and less than 250 ms latency. Any course that requires a connection to the shared cluster should provide at least 2 Mbps per student and less than 300 ms latency. **Any students that use a bring-your-own device (BYOD), for a course that supports it, should have at least 16 Mbps bandwidth and less than 300 ms latency.** Tablets will provide a less than satisfactory student experience and are not recommended. Laptop devices are preferred.

All specifications can be tested by using the compatibility tester*.

- **Individual student compatibility tester:**
  - https://www.redhat.com/rhtapps/services/compatibility
- **Facility compatibility tester:**
  - https://www.redhat.com/rhtapps/services/compatibility/classroom

The release of a universal compatibility tester is in planning stages and will be released at a later date. The tester application will reside on the same website page as other instant system/internet compatibility testing applications, and the results will be sent to a user provided email. This tester will evaluate both classroom device readiness and individual BYOD user's device & bandwidth readiness.

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Course & Exam Specific Hardware Requirements:

SKU	Course Title	Course Level	OS Version	# Student Machines	# Instructor Machines	Internet Required:	BYOD:	VT Lab Required:	Specific Ports Needed
AD183 v7	Red Hat Application Development I: Programming in Java EE	3	7.x	1	1	No	Not Available	No	None
AD240 v2.4	Build and Administer APIs with Red Hat 3scale API Management	4	7.x***	1	1	Yes	Not Available	No	None
AD248 v7	Red Hat JBoss Application Administration I	3	7.x	1	1	No	Not Available	No	None
AD348 v7	Red Hat JBoss Application Administration II	3	7.x	1	1	No	Not Available	No	None
AD364 v7.8	Developing Application Business Rules with Red Hat Decision Manager	3	8.x	1	1	Yes	Not Available	No	6443
AD371 v7	Red Hat Decision Manager and Red Hat Process Automation Manager for Business Users	4	7.x	1	1	No	Not Available	No	None
AD373 v7	Red Hat Decision Manager and Red Hat Process Automation Manager for Developers	4	7.x	1	1	No	Not Available	No	None
AD421 v6.3	Camel Development with Red Hat JBoss Fuse	2	7.x	1	1	No	Not Available	No	None
AD421 v7	Camel Development with Red Hat JBoss Fuse	4	7.x	1	1	No	Not Available	No	None
AD421 v7.1	Camel Development with Red Hat JBoss Fuse	4	7.x	1	1	No	Not Available	No	None
AD427 v6.3	Developing Workflow Applications with Red Hat JBoss BPM Suite	3	7.x	1	1	No	Not Available	No	None
AD440 v7	Red Hat JBoss AMQ Administration	2	7.x	1	1	No	Not Available	No	None
AD482 v7.9	Developing Event-Driven Applications with Apache Kafka and Red Hat AMQ Streams	2	8.x	0	0	Yes	BYOD Strongly recommended	Yes	6443
CEPH125 v3	Red Hat Ceph 3 Storage Architecture and Administration	4	7.x*	1	1	No	Not Available	No	None
CL110 v13	Red Hat OpenStack Administration I: Core Operations for Cloud Operators	4	7.x*	1	1	No	Not available	No	None
CL110 v16	Red Hat OpenStack Administration I: Core Operations for Cloud Operators	4	8.x	1	1	No	Not available	No	None
CL210 v13	Red Hat OpenStack Administration II: Infrastructure Configuration for Cloud Administrators	4	7.x*	1	1	No	Not available	No	None
CL210 v16	Red Hat OpenStack Administration II: Infrastructure Configuration for Cloud Administrators	4	8.x	1	1	No	Not available	No	None
CL260 v4.2	Cloud Storage with Red Hat Ceph Storage	4	8.x	1	1	No	Not available	No	None
CL310 v10	Red Hat OpenStack Administration III: Networking & Foundations of NFV	4	7.x*	1	1	No	Not available	No	None
DO101 v4.5	Introduction to Red Hat OpenShift Applications	2	8.x	0	0	Yes	BYOD Strongly recommended	Yes	6443
DO101 v4.6	Introduction to Red Hat OpenShift Applications	2	8.x	0	0	Yes	BYOD Strongly recommended	Yes	6443
DO180 v3.9	Red Hat OpenShift I: Containers & Kubernetes	4	7.x	1	1	No	Not available	No	None
DO180 v4.5	Red Hat OpenShift I: Containers & Kubernetes	2	7.x***	1	1	Yes	Not available	Yes	6443

DO180 v4.6	Red Hat OpenShift I: Containers & Kubernetes	2	8.x***	1	1	Yes	Not available	Yes	6643
DO250	Red Hat Training: Open Practices for your DevOps Journey	No Lab Env	-	-	-	-	-	-	-
DO280 v3.9	Red Hat OpenShift Administration II: Operating a Production Kubernetes Cluster	4	7.x	1	1	No	Not available	No	None
DO280 v4.5	Red Hat OpenShift Administration II: Operating a Production Kubernetes Cluster	2	8.x	1	1	Yes	Not available	Yes	None
DO280 v4.6	Red Hat OpenShift Administration II: Operating a Production Kubernetes Cluster	2	8.x	1	1	Yes	Not available	Yes	None
DO285 v3.9	Containers, Kubernetes, and Red Hat OpenShift Administration II	4	7.x	1	1	No	Not available	No	None
DO285 v4.5	Containers, Kubernetes, and Red Hat OpenShift Administration II	2	8.x	1	1	Yes	Not available	Yes	None
DO285 v4.6	Containers, Kubernetes, and Red Hat OpenShift Administration II	2	8.x	1	1	Yes	Not available	Yes	None
DO288 v3.6	Red Hat OpenShift Development II: Containerizing Applications	3	7.x	1	1	No	Not available	No	None
DO288 v4.5	Red Hat OpenShift Development II: Containerizing Applications	2	7.x***	1	1	Yes	Not Available	Yes	6443
DO288 v4.6	Red Hat OpenShift Development II: Containerizing Applications with Kubernetes	2	8.x	1	1	Yes	Not Available	Yes	6443
DO295 v4.5	Containers, Kubernetes, and Red Hat OpenShift Development II	2	7.x***	1	1	Yes	Not Available	Yes	6443
DO295 v4.6	Containers, Kubernetes, and Red Hat OpenShift Development II	2	8.x	1	1	Yes	Not Available	Yes	6443
DO322 v4.5	Red Hat OpenShift Installation Lab	2	8.x	1	1	Yes	Not Available	Yes	None
DO323 v4.5	Red Hat OpenShift Administration II with Installation Lab	2	8.x	1	1	Yes	Not Available	Yes	None
DO328 v4.4	Building Resilient Microservices with Istio and Red Hat Service Mesh [SM 1.1.x]	2	8.x	1	1	Yes	Not available	Yes	6443
DO326 v4.6	Red Hat OpenShift Platform Migration Lab	2	8.x	1	1	Yes	Not Available	Yes	None
DO370 v4.6	Enterprise Kubernetes Storage with Red Hat OpenShift Data Foundation	2	8.x	1	1	Yes	Not available	Yes	None
DO378 v4.5	Red Hat Cloud-native Microservices Development with Quarkus	2	8.x	1	1	Yes	Not available	Yes	6443
DO380 v3.6	Red Hat OpenShift Administration III: Scaling Kubernetes Deployments in the Enterprise	4	7.x	1	1	No	Not available	No	None
DO380 v4.5	Red Hat OpenShift Administration III: Scaling Kubernetes Deployments in the Enterprise	2	8.x	1	1	Yes	Not available	Yes	None
DO380 v4.6	Red Hat OpenShift Administration III: Scaling Kubernetes Deployments in the Enterprise	2	8.x	1	1	Yes	Not available	Yes	None
DO400 v4.5	Red Hat DevOps Pipelines and Processes: CI/CD with Jenkins, Git, and Test Driven Development (TDD)	2	8.x	1	1	Yes	BYOD Strongly recommended	Yes	6443
DO401 v4.5	Red Hat DevOps Pipelines and Processes: CI/CD with Jenkins	2	8.x	1	1	Yes	BYOD Strongly recommended	Yes	6443
DO402 v4.5	Red Hat DevOps Pipelines and Processes: Git and Test Driven Development (TDD)	2	8.x	1	1	Yes	BYOD Strongly recommended	Yes	6443
DO417 v2.8	Microsoft Windows Automation with Red Hat Ansible	2	8.x	0	0	Yes	Optional	Yes	3389

DO447 v2.8	Advanced Automation: Red Hat Ansible Best Practices	4	8.x	1	1	No	Not available	No	None
DO457 v2.5	Red Hat Ansible for Network Automation	1	7.x***	1	1	Yes	Not available		
DO480 v4.6	Managing Red Hat OpenShift Container Platform with Advanced Cluster Manager (RHACM)	2	8x	1	1	Yes	Not available	Yes	None
DO500	DevOps Culture & Practice	-	-	0	0	Yes	Required	Yes	8443
DO700 v3.x	OpenShift Catalyst Boot Camp for Administrators	-	-	0	0	Yes	Required	Yes	None
DO700 v4.x	OpenShift Catalyst Boot Camp for Administrators	-	-	0	0	Yes	Required	Yes	6443
DO720 v4.x	OpenShift Catalyst Boot Camp for Developers	-	-	0	0	Yes	Optional	Yes	
RH124 v7	Red Hat System Administration I	1	7.x	1	1	No	Not Available	No	None
RH124 v8	Red Hat System Administration I	2	8.x	1	1	No	Not Available	No	None
RH124 v8.2	Red Hat System Administration I	3	8.x	1	1	No	Not Available	No	None
RH134 v7	Red Hat System Administration II	1	7.x	1	1	No	Not Available	No	None
RH134 v8	Red Hat System Administration II	2	8.x	1	1	No	Not Available	No	None
RH134 v8.2	Red Hat System Administration II	3	8.x	1	1	No	Not Available	No	None
RH199 v7	RHCSA Rapid Track Course	1	7.x	1	1	No	Not Available	No	None
RH199 v8	RHCSA Rapid Track Course	2	8.x	1	1	No	Not Available	No	None
RH199 v8.2	RHCSA Rapid Track Course	3	8.x	1	1	No	Not Available	No	None
RH236 v3.1	Red Hat Gluster Storage Administration	3	7.x	1	1	No	Not Available	No	None
RH254 v7	Red Hat System Administrator III	1	7.x	1	1	No	Not Available	No	None
RH294 v8	Red Hat Enterprise Linux Automation with Ansible	2	8.x	1	1	No	Not Available	No	None
RH299 v7	RHCE Certification Lab	1	7.x	1	1	No	Not Available	No	None
RH318 v4.3	Red Hat Virtualization	4	7.x*	1	1	No	Not Available	No	None
RH342 v7	Red Hat Enterprise Linux Diagnostics and Troubleshooting	2	7.x	1	1	No	Not Available	No	None
RH354 v8	Red Hat Enterprise Linux 8 New Features for Experienced Linux Administrators	3	8.x	1	1	No	Not Available	No	None
RH358 v8	Red Hat Services Management and Automation	3	8.x	1	1	No	Not Available	No	None
RH362 v7.4	Red Hat Identity Management with Microsoft Active Directory Integration	4	7.x	1	1	No	Not Available	No	None
RH403 v6.6	Red Hat Satellite 6 Administration	4	7.x and 8.x	1	1	Yes	Not available	Yes	None
RH415 v7	Red Hat Security: Linux in Physical, Virtual, and Cloud	4	7.x	1	1	No	Not Available	No	None
RH436 v7	Red Hat High Availability Clustering	3	7.x	1	1	No	Not Available	No	None
RH436 v8	Red Hat High Availability Clustering	3	8.x	1	1	No	Not Available	No	None
RH442 v7	Red Hat Enterprise Performance Tuning	2	7.x	1	1	No	Not Available	No	None
RH442 v8	Red Hat Enterprise Performance Tuning	2	8.x	1	1	No	Not Available	No	None
SKU	**Exam Title**	**Course Level**	**OS Version**	**# Student Machines**	**# Instructor Machines**	**Internet Required:**	**BYOD:**	**VT Lab Required:**	**Specific Ports Needed**

EX125	Red Hat Certified Specialist in Ceph Storage Administration Exam	4	7.x**	1	1	-	-	-	-
EX180	Red Hat Certified Specialist in Containers and Kubernetes	3	8.x	1	1	Yes			
EX180 v46	Red Hat Certified Specialist in Containers and Kubernetes	3	8.x	1	1	Yes	-	-	-
EX183	Red Hat Certified Enterprise Application Developer Exam	3	7.x**	1	1	-	-	-	-
EX200	Red Hat Certified System Administrator (RHCSA) Exam	1	7.x**	1	1	-	-	-	-
EX200v8	Red Hat Certified System Administrator (RHCSA) Exam	3	8.x	1	1	-	-	-	-
EX210 v13	Red Hat Certified Specialist in Cloud Infrastructure Exam	4	7.x**	1	1	-	-	-	-
EX210 v16	Red Hat Certified Specialist in Cloud Infrastructure Exam	4	7.x**	1	1	-	-	-	-
EX236	Red Hat Certified Specialist in Gluster Storage Administration Exam	3	7.x**	1	1	-	-	-	-
EX240	Red Hat Certified Specialist in API Management Exam	4	7.x**	1	1	-	-	-	-
EX248	Red Hat Certified JBoss Administration (RHCJA) Exam	3	7.x**	1	1	-	-	-	-
EX260 v42	Red Hat Certified Specialist in Ceph Cloud Storage	4	8.*	1	1	-	-	-	-
EX280 v39	Red Hat Certified Specialist in OpenShift Administration Exam	4	7.x**	1	1	-	-	-	-
EX280 v42	Red Hat Certified Specialist in OpenShift Administration Exam	1	7.6	1	1	Yes	-	-	-
EX280 v45	Red Hat Certified Specialist in Kubernetes Administration Exam	1	7.6	1	1	Yes	-	-	-
EX280 v46	Red Hat Certified Specialist in Kubernetes Administration Exam	1	8.x	1	1	Yes	-	-	-
EX283	Red Hat Certified Enterprise Microservices Developer	3	7.x**	1	1	-	-	-	-
EX288 v36	Red Hat Certified Specialist in OpenShift Application Development Exam	3	7.x**	1	1	-	-	-	-
EX288 v42	Red Hat Certified Specialist in OpenShift Application Development Exam	1	7.x***	1	1	Yes	-	-	-
EX288 v45	Red Hat Certified Specialist in Kubernetes Application Development Exam	1	7.x***	1	1	Yes	-	-	-
EX288 v46	Red Hat Certified Specialist in Kubernetes Application Development Exam	1	8.x	1	1	Yes	-	-	-
EX294	Red Hat Certified Engineer (RHCE) Exam	2	8.x	1	1	-	-	-	-
EX294 v83	Red Hat Certified Engineer (RHCE) Exam	2	8.x	1	1	-	-	-	-
EX300	Red Hat Certified Engineer (RHCE) Exam	1	7.x**	1	1	-	-	-	-
EX310 v10	Red Hat Certified Specialist in Edge Computing and Networking exam	4	7.x**	1	1	-	-	-	-
EX310 v16	Red Hat Certified Specialist in Edge Computing and Networking exam	1	8.*	1	1	Yes	-	-	-
EX318 v41	Red Hat Certified Specialist in Virtualization Exam	4	7.x**	1	1	-	-	-	-
EX318v43	Red Hat Certified Specialist in Virtualization Exam	1	7.6+	1	1	Yes	-	-	-
EX328	Red Hat Certified Specialist in Service Mesh for Resilient Microservices Exam	2	8.x	1	1	Yes	-	-	-
EX342	Red Hat Certified Specialist in Linux Diagnostics and Troubleshooting	2	7.x**	1	1	-	-	-	-

EX342 v80	Red Hat Certified Specialist in Linux Diagnostics and Troubleshooting	3	8.x**	1	1	-	-	-	-
EX342 v84	Red Hat Certified Specialist in Linux Diagnostics and Troubleshooting	3	8.x	1	1	-	-	-	-
EX358	Red Hat Certified Specialist in Services Management and Automation Exam	3	8.x (8.1)	1	1	-	-	-	-
EX362	Red Hat Certified Specialist in Identity Management	4	7.x**	1	1	-	-	-	-
EX364 v78	Red Hat Certified Specialist in Decision Management Exam	4	8.2	1	1	-	-	-	-
EX378 v17	Red Hat Certified Cloud-native Developer Exam	4	8.2	1	1	-	-	-	-
EX370	Red Hat Certified Specialist in OpenShift Data Foundation Exam	1	8.x	1	1	Yes	-	-	-
EX380	Red Hat Certified Specialist in Scaling OpenShift Deployments Exam	2	8.x**	1	1	Yes	-	-	-
EX380 v46	Red Hat Certified Specialist in Scaling OpenShift Deployments Exam	1	8.x	1	1	Yes	-	-	-
EX403	Red Hat Certified Specialist in Deployment and Systems Management Exam	3	7.x**	1	1	-	-	-	-
EX403 v66	Red Hat Certified Specialist in Deployment and Systems Management Exam	1	7.6+	1	1	Yes	-	-	-
EX405	Red Hat Certified Specialist in Configuration Management Exam	3	7.x**	1	1	-	-	-	-
EX407	Red Hat Certified Specialist in Ansible Automation Exam	2	7.x**	1	1	-	-	-	-
EX407 v27	Red Hat Certified Specialist in Ansible Automation Exam	2	7.x**	1	1	-	-	-	-
EX415 v75	Red Hat Certified Specialist in Security: Linux	3	7.x**	1	1	-	-	-	-
EX421	Red Hat Certified Specialist in Camel Development Exam	3	7.x**	1	1	-	-	-	-
EX425 v311	Red Hat Certified Specialist in Security: Containers and OpenShift Container Platform	4	7.x	1	1			-	-
EX427	Red Hat Certified Specialist in Business Process Design Exam	3	7.x**	1	1	-	-	-	-
EX436 v7	Red Hat Certified Specialist in Clustering and Storage Management Exam	3	7.x**	1	1	-	-	-	-
EX436 v83	Red Hat Certified Specialist in Clustering and Storage Management Exam	3	8.x	1	1	-	-	-	-
EX440	Red Hat certified Specialist in Messaging Administration exam	3	7.x**	1	1	-	-	-	-
EX442 v7	Red Hat Certified Specialist in Performance Tuning Exam	2	7.x**	1	1	-	-	-	-
EX442v8	Red Hat Certified Specialist in Performance Tuning Exam	2	8.x	1	1	-	-	-	-
EX447	Red Hat Certified Specialist in Advanced Automation: Ansible Best Practices Exam	4	8.x	1	1	-	-	-	-
EX457	Red Hat Certified Specialist in Red Hat Ansible Network Automation Exam	4	8.*	1		-	-	-	-
EX467 v2K	Red Hat Certified Specialist in Advanced Automation: Ansible Best Practices Exam	4	8.x	1	1	-	-	-	-
EX480	Red Hat Certified Specialist in Advanced Cluster Management for OpenShift Exam	1	8.x	1	1	Yes	-	-	-
EX482	Red Hat Certified Specialist in Reactive Application Development Exam	4	8.x	1	1	-	-	-	-
PE110V16	Red Hat Preliminary Exam in Red Hat OpenStack Administration Version 16	-	-	-	-	Yes	Required	-	-
PE124V70	Red Hat Preliminary Exam in System Administration I Version 7.0	-	-	-	-	Yes	Required	-	-

PE124V80	Red Hat Preliminary Exam in System Administration I Version 8.0	-	-	-	-	Yes	Required	-	-
PE180V10	Red Hat Preliminary Exam in containers, Kubernetes, and Red Hat OpenShift Version 10	-	-	-	-	Yes	Required	-	-

** This course requires nested virtualization. Note, physical machines running later RHEL versions provide the best performance.*
*** The maximum Foundation version is 7.5 due to issues with registration. Foundation 7.6 or later may be allowed with prior approval from the Certification Team.*
**** A second NIC is required in the instructor machine for internet connectivity.*