

RHCE and RHCT Exam Preparation Guide

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Overview

This guide provides information candidates may use in preparing to take the RHCT or RHCE exam. Red Hat is not responsible for the content or accuracy of other guides, books, online resources, or any other information provided by organizations or individuals other than Red Hat Global Learning Services. Red Hat reserves the right to change this Guide when appropriate, and candidates who have enrolled in forthcoming classes or exams are advised to check this guide periodically for changes.

The Red Hat Certified Engineer (RHCE) and Red Hat Certified Technician (RHCT) exams are performance-based evaluations of Red Hat Enterprise Linux and Red Hat Linux system administration skills and knowledge. Candidates perform a number of routine system administration tasks and are evaluated on whether they have met specific objective criteria. Performance-based testing means that candidates must perform tasks similar to what they must perform on the job.

Prospective employers of RHCEs and RHCTs should verify any and all claims by people claiming to hold one of these certificates by requesting their certificate number and [verifying it here](#).

Only Red Hat and Red Hat Certified Training Partners administer the RHCE and RHCT exams. Prospective candidates should exercise due diligence when purchasing a seat in an RHCE or RHCT exam from a provider other than Red Hat itself. They should verify that the provider is, in fact, an authorized training partner in good standing. Please notify greymarket@redhat.com about organizations that purport to offer the RHCE or RHCT exams, but who are not Red Hat Certified Training Partners.

Official scores for the RHCE and RHCT exams come exclusively from Red Hat Certification Central. Red Hat does not authorize examiners or training partners to report results to candidates directly. Scores on the exam are usually reported within three (3) US business days.

Exam results are reported as section scores. Red Hat does not report performance on individual items, nor will it provide additional information upon request.

Preparation for the RHCT and RHCE Exams

Red Hat encourages all candidates for RHCT and RHCE to consider taking one or more of its official training courses to help prepare for the RHCE or RHCT exam. Attendance in these classes is not required, and one can choose to take just an exam. Many successful candidates who have come to class already possessing substantial skills and knowledge have reported that the class made a positive difference for them.

To help you determine the best courses to take, Red Hat provides [online skills assessment](#).

While attending Red Hat's classes can be an important part of one's preparation to take the RHCE or RHCT exam, attending class does not guarantee success on the exam.

Previous experience, practice, and native aptitude are also important determinants of success.

Many books and other resources on system administration for Red Hat's OS products are available. Red Hat does not officially endorse any as preparation guides for the RHCT or RHCE exams. Nevertheless, you may find additional reading deepens understanding and can prove helpful.

Components of the RHCE and RHCT Exams

The RHCT exam is a subset of the RHCE exam, and is organized as follows:

- **Troubleshooting and System Maintenance — 1 hour**
- **Installation and Configuration — 2 hours**

In order to earn RHCT, one must successfully complete all the requirements in Troubleshooting and System Maintenance, and must achieve a score of 70 or higher on Installation and Configuration.

For RHCE exams given on Red Hat Enterprise Linux 3 and higher, the exam is organized as follows:

- **Troubleshooting and System Maintenance — 2.5 hours**
- **Installation and Configuration — 3.0 hours**

In order to earn RHCE, one must successfully complete all the RHCT-level Troubleshooting and System Maintenance requirements, and successfully complete enough additional RHCE items to earn a score of 80 or higher overall on the section. In addition, one must score 70 or higher on the RHCT items of Installation and Configuration, and 70 or higher on the RHCE components of that section. We describe the skills associated with RHCT and RHCE below.

For RHCE exams given on Red Hat Linux 9, the following structure applies:

- **Troubleshooting — 2.5 hours**
- **Multiple Choice — 1.0 hour**
- **Installation and Configuration — 2.5 hours**

In order to earn RHCE on these exams, one must successfully complete all the RHCT-level Troubleshooting requirements, score a minimum of 50 on the multiple choice, score 70 or higher on both the RHCE and RHCT components, and earn an overall score of 80 or better for the exam as a whole.

Study Points for the RHCE Exam

Prerequisite skills for RHCT and RHCE

Candidates should possess the following skills, as they may be necessary in order to fulfill requirements of the RHCT and RHCE exams:

- use standard command line tools (e.g., ls, cp, mv, rm, tail, cat, etc.) to create, remove, view, and investigate files and directories
- use grep, sed, and awk to process text streams and files
- use a terminal-based text editor, such as vi/vim, to modify text files
- use input/output redirection
- understand basic principles of TCP/IP networking, including IP addresses, netmasks, and gateways
- use su to switch user accounts
- use passwd to set passwords
- use tar, gzip, and bzip2v
- configure an email client on Red Hat Enterprise Linux
- use mozilla and/or links to access HTTP/HTTPS URLs
- use lftp to access FTP URLs

RHCT skills

Troubleshooting and System Maintenance

RHCTs should be able to:

- boot systems into different run levels for troubleshooting and system maintenance
- diagnose and correct misconfigured networking
- diagnose and correct hostname resolution problems
- configure the X Window System and a desktop environment
- add new partitions, filesystems, and swap to existing systems
- use standard command-line tools to analyze problems and configure system

Installation and Configuration

RHCTs must be able to:

- perform network OS installation
- implement a custom partitioning scheme
- configure printing
- configure the scheduling of tasks using cron and at
- attach system to a network directory service, such as NIS or LDAP
- configure autofs
- add and manage users, groups, and quotas
- configure filesystem permissions for collaboration
- install and update RPMs
- properly update the kernel RPM
- modify the system bootloader
- implement software RAID at install-time and run-time
- use /proc/sys and sysctl to modify and set kernel run-time parameters

RHCE skills

Troubleshooting and System Maintenance

RHCEs must demonstrate the RHCT skills listed above, and should be able to:

- use the rescue environment provided by first installation CD
- diagnose and correct bootloader failures arising from bootloader, module, and filesystem errors
- diagnose and correct problems with network services (see *Installation and Configuration* below for a list of these services)
- add, remove, and resize logical volumes

Installation and Configuration

RHCEs must demonstrate the RHCT-level skills listed above, and they must be capable of configuring the following network services:

- HTTP/HTTPS
- SMB
- NFS
- FTP
- Web proxy
- SMTP
- IMAP, IMAPS, and POP3
- SSH
- DNS

For each of these services, RHCEs must be able to:

- install the packages needed to provide the service
- configure the service to start when the system is booted
- configure the service for basic operation
- Configure host-based and user-based security for the service

RHCEs must also be able to:

- configure hands-free installation using Kickstart
- implement logical volumes at install-time
- use PAM to implement user-level restrictions

Red Hat Courses Covering These Skills

- [RH033 Red Hat Linux Essentials](#) covers prerequisite skills, with the exception of TCP/IP fundamentals. The [Network Essentials](#) series covers TCP/IP fundamentals
- [RH133 Red Hat Linux System Administration](#) covers RHCT-level skills.
- [RH253 Red Hat Linux Networking Services and Security](#) covers RHCE-specific skills in networking services and security. Attendees should attend RH133 first.
- [Red Hat RHCE Fast Track Course](#) condenses material from RH133 and RH253. Only experienced Linux and UNIX system administrators with background in networking services should attend.

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Skills Courses

Red Hat offers a suite of courses focused on basic Linux administration skills. These courses provide an organized training path for those who are new to Linux or have limited experience with Linux administration and networking.

Updated for building skills on Red Hat Enterprise Linux 3!

Skills Training Courses

[RH033 Red Hat Linux Essentials](#)

[RH133 Red Hat Linux System Administration](#)

[RH253 Red Hat Linux Networking and Security Administration](#)

[RH301 Red Hat Linux Rapid Track Course](#)

Each course consists of hands-on training. Emphasis is on actual tasks and processes. Individuals who already have some experience can enter the skills path at the appropriate level. Those who already have all the skills covered in these courses should consider taking the [RH300 course](#) or [RHCE™ exam-only](#).

Skills Program Information

Red Hat Training: Principles

Red Hat strives to have the most useful, practical, high quality training on Red Hat Linux available. At the same time, Red Hat encourages and expects Red Hat Linux users to view training as just one component of professional development and skills building. Training alone is not enough to become a competent user, operator, system administrator or engineer. Appropriate levels and quantities of work experience, reading, research, plus staying current with technology, with best practices, and with user communities are all essential to turning the skills and knowledge in a training program into high quality professional performance on the job.

These courses are designed to provide rapid introduction to essential knowledge and skills, not turn someone into an expert in a week. They are designed to create a basis for further development and real-world practice. Good training can provide a foundation; the participant must do the rest.

Please see our [registration page](#) for contact information and other registration policies. For details about the training center and/or nearby accommodations, see our list of [training locations](#).

Course Goals and Descriptions

Please read descriptions and notes for each course carefully. Be aware of the following: Some prerequisites in the skills path must be acquired through generally available training or reference sources. For example, prior to taking RH253 Red Hat Linux Networking and Security Admin course it is recommended that the participant take a standard Internetworking with TCP/IP course or its equivalent in self-study. This body of knowledge is widely available through training, reference books, and the web itself. Certain topics in the skills path are trained only to an introductory level. For example, tools or services such as perl or sendmail are entire skill areas and professional specialties unto themselves, and could be the subject of several days' worth of training in their own right.

Security is a whole field of specialization unto itself that requires continual practice, training, tactical skills, programming, and networking expertise. All training on security topics must be very modest in its claims. RH253 Networking Services and Security Admin course is only an introductory starting point for further study, preparation, and practice in administering host and network security in an environment of common IP services.

Security Courses

The Red Hat Security Curriculum provides in-depth, hands-on training for IT professionals who wish to extend their knowledge of the security features and capabilities found in Red Hat Linux and other open source tools.

Security Training Courses

[RHS333 Red Hat Enterprise Security: Network Services](#)

[RHS342 Developing Red Hat Firewall Solutions](#)

These courses are all peer in terms of prerequisites and preparation. Participants should already have skills in Linux administration and network services equivalent to what is covered in RH253, RH300. Certification as RHCE is not required, but comparable skills and competencies are assumed.

Other Security-related courses:

[RH253 Red Hat Linux Networking and Security](#)
[RH320 Apache Secure Web Server Administration](#)
[RH423 Red Hat Enterprise Directory Services and Authentication](#)

Security Program Information

Security is a specialization unto itself that requires continual practice, training, tactical skills, programming, networking expertise, and staying current with the volatile and ever-changing world of intrusion methods. All training on security topics must be very modest in its claims, and no training on security can provide guarantees of any kind.

Red Hat makes no guarantees about results or outcomes obtained from taking Red Hat security-related courses or applying principles or methods learned therein. Individual outcomes may vary. All knowledge, methods, practices, and principles discussed during Red Hat training are applied at the sole risk of the participant.

Please see our registration page for contact information and other registration policies. For details about the training center and/or nearby accommodations, see our list of training locations.

Red Hat Certified Architect (RHCA)

Enterprise Architect curriculum and RHCA certification

Red Hat's Enterprise Architect courses provide in-depth, hands-on training for senior Linux system administrators responsible for the deployment and management of many systems in large enterprise environments. Red Hat Certified Architect (RHCA) is a capstone certification to Red Hat Certified Engineer (RHCE) and Red Hat Certified Technician (RHCT), the most recognized, acclaimed, and mature certifications in the Linux space.

The full RHCA curriculum consists of four advanced 400-level Enterprise Architect courses and an upper-level security course.

- [Overview of Red Hat Certifications](#)

Red Hat Certified Architect Courses

[RHS333 Red Hat Enterprise Security: Network Services](#) (4 days)

[RH401 Red Hat Enterprise Deployment and Systems Management](#) (4 days)

[RH423 Red Hat Enterprise Directory Services and Authentication](#) (4 days)

[RH436 Red Hat Enterprise Storage Management](#) (4 days) new course!

[RH442 Red Hat Enterprise System Monitoring and Performance Tuning](#) (4 days) new course!

- [Maestro bundle](#): purchase all five courses together for maximum savings.

These courses feature equipment-intensive classrooms and build on the skills covered in the Red Hat Certified Engineer (RHCE) program, which is a prerequisite for all 400-level courses. Prospective course participants who do not possess RHCE certification are strongly advised to take Red Hat's pre-assessments prior to enrolling in any 400-level course.

A Red Hat Certified Architect will have proven the skills required to design and manage a complete infrastructure for large complex environments. RHCA competencies span servers running operations, back-end databases and storage in the datacenter, corporate desktops, and beyond.

- [RHCA FAQ](#)
- [RHCA brochure](#)

Red Hat Certified Architect (RHCA) Exam

Enterprise Architect competencies can be tested and proven by taking and passing the RHCA exam. Dates and availability will be announced later this year. RHCA, like Red Hat's other two certifications, will be entirely performance-based. Potential candidates will have the opportunity to enroll in a week of supervised lab time prior to attempting the RHCA exam

Red Hat Certified Engineer Program

RHCE and RHCT are performance-based tests that measure actual competency on live systems. Other training programs teach students to answer multiple choice questions instead of how to perform on real-world systems. Red Hat training and testing focuses on practical hands-on skills. No wonder Red Hat's RHCE Program has been called the "crown jewel" of Linux certifications! And a recent Independent Survey ranked RHCE highest quality training and certification in IT!

RHCE and RHCT are available in 40 cities in North America, and expanding! The chart below will help you find the right course for you! Click on the course number below or at left to view dates, locations, descriptions, prerequisites, and prices.

Updated for building skills on Red Hat Enterprise Linux 3!

Levels	Prerequisite Skills Required	Standard	Rapid	Exam-Only	Bundles
RED HAT CERTIFIED ENGINEER (RHCE)					
RHCE Exam	Experience setting up and managing Red Hat servers running network services and security	RH302 1d \$749	Included in RH300	RH302 1d \$749	RHCE and RHCT Bundles
Engineer	Experience managing Red Hat or UNIX servers, including network services		RH300 5d \$2498	RH301 4d \$2298	
Engineer	RH033, RH133, RHCT, or equivalent experience as UNIX/Red Hat technician	RH253 4d \$2198			RH253 eLearning Series \$1620
RED HAT CERTIFIED TECHNICIAN (RHCT)					
RHCT Exam	RH033, RH133, or equivalent experience attaching new Red Hat systems to a corporate network	Included in RH133		RH202 .5d \$349	RHCT Bundle
Technician	RH033 and/or some UNIX/Red Hat experience	RH133 4.5d \$2298		RH131 4d \$2098	RH133 eLearning Series \$1620
Operator	No UNIX or Red Hat experience; MCSE, MCP, CNE or other OS operator / user experience	RH033 4d \$1998			RH033 eLearning Series \$900

RHCE / RHCT Program Information

1. RHCE Curriculum Tracks

There are two RHCE Program curriculum tracks: Rapid and Standard. The RH300 RHCE Rapid Track course is aimed at those who already possess significant systems administration experience and knowledge in a UNIX or Linux environment, and who desire to become certified at the level indicated above. Good candidates for RHCE consist of individuals who fit the following profiles:

- Experienced UNIX systems administrators and UNIX system engineers
- Experienced UNIX or Linux network engineers, NOC and ISP technical staffers
- Experienced Linux systems administrators and engineers
- Other UNIX and/or Linux power-users who may want focused training and certification on Red Hat Enterprise Linux
- [RH300 Course Outline](#)

- [RH300 Prerequisites](#)

The Standard Track consists of 3 courses -- RH033, RH133, RH253 -- and is aimed at persons who need more review of key concepts or who are new to both UNIX and Linux.

- RH033 targets IT professionals with no prior UNIX or Linux experience, and covers skills to prepare for RH133, including shell and command line essentials.
- RH133 is designed for those wanting to prepare for professional responsibilities as a Linux systems administrator at the Technician level. You'll learn all the skills required to manage a Linux workstation and attach it to a corporate network, including configuration of client-side network services. Prerequisites include networking fundamentals and internetworking with TCP/IP, widely available from reputable training vendors or through self-study. RH133 now includes the RHCT Exam as last half of last day.
- RH253 is designed for those who desire to build skills at configuring and administering a Red Hat Linux server running key enterprise network services and security. Prerequisites include RH133 or equivalent skills.

Certification	Job Role Level	Job Role Description	Exam Duration
RHCE	Engineer	Set up and manage Linux servers running production network services and security	5.5 hrs
RHCT	Technician	Set up and manage new Linux systems on an existing network	3 hrs

2. (a) **The RHCE Certificate:**

The RHCE certificate is designed to fit in a specific place within the computer industry spectrum of UNIX/Linux user levels.

The RHCE Certificate is granted upon passing the RHCE Exam, a performance-based test on live equipment that measures actual competencies at server system administration, setup of networking services, and network security, and diagnostics and troubleshooting. The RHCE Exam can be taken alone as RH302 RHCE Exam (1-day) or as the final day of the RH300 RHCE Rapid Track course (5-days). RH300 consists of 4 days of intensive training, emphasizing hands-on lab workshops with realistic configuration and administration tasks using Red Hat Linux, plus the Certification Lab Exam on day 5.

(b) The RHCT Certificate:

The RHCT Certificate is granted upon passing the RHCT Exam, a performance-based test on live equipment that measures actual competencies at system administration, including installation and configuration of a Red Hat Linux system and attaching it to a live network running network services. The RHCT Exam can be taken on the final day of RH133 Red Hat Linux System Administration (4.5 days), or alone as RH202 RHCT Exam. The RHCT certificate may also be granted to those who take the RHCE Exam and pass all RHCT-specific competencies which are included in the RHCE Exam.

3. Goal of RHCE and RHCT Certification

The primary goal of RHCE and RHCT certification is to meet the demand of individuals and employers for useful metrics of individual skills and competencies with [Red Hat Linux](#), the largest-selling distribution of Linux. The RHCE Program provides performance based certification at two critical job role levels: Technician (RHCT) and Engineer (RHCE).

RHCE and/or RHCT may be required for selected personnel employed at Red Hat channel partners, IHVs, ISVs, OEMs, and other partners, to provide meaningful assurance of standards.

4. Meaning of RHCE and RHCT Certification

RHCE or RHCT certification serve as a metric (hopefully one of many) of use to both individuals and employers to assess individual preparation and competency for key job roles involving Red Hat Linux computing.

(a) RHCE certification indicates that the person has passed a realistic performance-based lab exam that tests his/her ability to: install and configure Red Hat Linux; understand limitations of hardware; configure basic networking and file systems for a network; configure the X Window System; perform essential Red Hat Linux system administration; configure basic security for a network server; set up and manage common enterprise networking (IP) services for the organization, carry out server diagnostics and troubleshooting.

The readiness objective of RHCE is to assure standard level of systems and network administration skills so that a person is "ready from a technical point of view for professional responsibilities in setting up, configuring, and managing a Red Hat Linux server running common enterprise networking services and security."

(b) RHCT certification indicates that the person has passed a realistic performance-based lab exam that tests his/her ability to: install and configure Red Hat Linux; understand limitations of hardware; configure basic networking and

file systems for a single system attached to a network; configure the X Window System; perform essential Red Hat Linux system administration; configure basic host security, set up client-side networking services required to attach to a production network, and carry out basic diagnostics and troubleshooting.

The readiness objective of RHCT is to assure a minimum level of systems administration skills so that a person is "ready from a technical point of view for professional responsibilities in installing, configuring, attaching, and supporting Red Hat Linux systems on an existing production network."

5. Certification in the context of professionalism

Becoming a successful technician or engineer requires years of experience in heterogeneous, networked computing environments, coping with day-to-day issues, and developing best practices. This kind of experience does not result from taking one course or exam, but it can be measured during training and in a certification exam, especially if these are administered using hands-on exercises in a lab. That's why the RHCE and RHCT exams are lab-based, performance-based practical exams.

Red Hat is benchmarking the RHCE and RHCT certificates to be useful metrics for measuring experience, skill, and competency with Red Hat Linux, and for demonstrating preparedness for professional responsibilities at two critical levels of Red Hat Linux systems administration.

6. The RHCE Certification Lab Exam

The RHCE certificate requires passing the RHCE Certification Lab Exam. The RHCE Certification Lab Exam is composed of two elements: a server install and network services configuration lab (3 hours) and a troubleshooting and maintenance lab (2 1/2 hours). The two performance based parts of the Lab Exam present realistic problems that require planning, diagnosis, and development of complete solutions.

Fair game for the Certification Lab Exam consists of: the prerequisites for RHCE, plus everything covered in the RHCE curriculum and prerequisites. The exam is closed book; no notes. Please see the [RHCE Exam Prep Guide](#)

7. The RHCT Certification Lab Exam

The RHCT certificate requires passing the RHCT Certification Lab Exam. The RHCT Certification Lab Exam will be composed of two elements: a diagnostics and troubleshooting lab (1 hour), and system install configuration, and attachment to network (2 hours). RHCT is thus entirely performance based, with no multiple choice component. RHCT presents realistic problems that require planning, diagnosis, and development of complete solutions.

Fair game for the Certification Lab Exam consists of: RH033, prerequisites for RH133 including Networking Fundamentals and Internetworking with TCP/IP, plus everything covered in the RH133 curriculum. The exam is closed book; no notes. Please see the RHCT section in the [RHCE Exam Prep Guide](#).

8. Certificates

The RHCE and RHCT exams are pass or non-pass. Official notification of PASS or DID NOT PASS is sent via email within 3 business days of the RHCE Exam. Individuals who complete all training elements but do not pass the Exam will receive a Certificate of Achievement. Individuals who complete all training and pass the Certification Lab Exam will receive in addition a Red Hat Certified Technician or Red Hat Certified Engineer certificate. Electronic certificates suitable for printing will be sent with exam results for those who qualify. All certificates list the specific release of Red Hat Linux.

9. Verification and Validity Period

Red Hat provides complete verification of RHCE certification, including version numbers, at Certification Central, so that individuals, their employers and customers can make their own informed decisions based on what version they are actually running and how critical re-certification is for their own requirements.

The validity period for all RHCEs and RHCTs is now officially pegged to the release of the Enterprise product commercially available at the time certification was earned, and certification shall be current until after one (1) major release of the Enterprise product. All RHCEs earned on Red Hat Linux 7.3 or prior will be considered current until the release of Red Hat Enterprise Linux AS/ES/WS 4. All RHCEs and RHCTs earned on Red Hat Linux 8.0 or 9 will remain current until the release of Red Hat Enterprise Linux 5. Validity and current status of an RHCE certificate will continue to be verified at Certification Central.

Our information suggests that the RHCE is such a strong certification that RHCEs in continuous practice as professionals are likely to be able to keep their skill levels up in pace with Red Hat Linux technology. Some Red Hat partner programs mandate RHCEs maintain certification on the most recent release.

10. Courses and Certification above RHCE

Persons with RHCE certification or equivalent may be interested in RH401 Red Hat Enterprise Deployment and Systems Management. This course provides each student with 3 servers and a SAN so that they can practice the failover and load balancing capabilities of Red Hat Enterprise Linux AS. RH401 also trains on performance tuning as well as enterprise software deployment using CVS, rpm, RHN.

If the market need for other levels or types of certification becomes clear, Red Hat will consider ways to address these.

11. Contact Information

For questions other than schedules and registration, please contact the appropriate country or region manager:

- [Red Hat Training Contacts: U.S. and Canada](#)
- [Red Hat Training Contacts: Europe, Japan, & Worldwide](#)