

# Red Hat Certificate of Expertise in Server Hardening exam (EX413)

## In preparation

### Study points for the exam

To help you prepare, review the exam objectives which highlights the task areas you can expect to see covered in the exam. Red Hat reserves the right to add, modify, and remove exam objectives. Such changes will be made public in advance.

Candidates for the Red Hat Certificate of Expertise in Server Hardening should be able to perform the following tasks:

- Identify Red Hat Common Vulnerabilities and Exposures (CVEs) and Red Hat Security Advisories (RHSA) and selectively update systems based on this information
- Verify package security and validity
- Identify and employ standards-based practices for configuring file system security, create and use encrypted file systems, tune file system features, and use specific mount options to restrict access to file system volumes
- Configure default permissions for users and use special file permissions, attributes, and access control lists (ACLs) to control access to files
- Install and use intrusion detection capabilities in Red Hat Enterprise Linux to monitor critical system files
- Manage user account security and user password security
- Manage system login security using pluggable authentication modules (PAM)
- Configure console security by disabling features that allow systems to be rebooted or powered off using bootloader passwords
- Configure system-wide acceptable use notifications
- Install, configure, and manage identity management services and configure identity management clients
- Configure remote system logging services, configure system logging, and manage system log files using mechanisms such as log rotation and compression
- Configure system auditing services and review audit reports
- Use network scanning tools to identify open network service ports and configure and troubleshoot system firewalling

As with all Red Hat performance-based exams, configurations must persist after reboot without intervention.

### What you need to know

Red Hat encourages all candidates for the Red Hat Certificate of Expertise in Server Hardening exam to consider taking [Red Hat Server Hardening \(RH413\)](#) training course. Attendance in this class is not required, so you can choose to take just the exam.

While attending Red Hat classes can be an important part of preparation for this 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 products are available. Red Hat does not officially endorse any as preparation guides for its exam. Nevertheless, you may find additional reading deepens understanding and can prove helpful.

### Exam format

This exam is a performance-based evaluation of server hardening skills and knowledge. Candidates perform a number of systems administration tasks focused on securing servers against unauthorized access and are evaluated on whether they have met specific objective criteria. Performance-based testing means that candidates must perform tasks similar to what they perform on the job.

This exam consists of 1 section lasting 4 hours.

### Scores and reporting

Official scores for 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 3 U.S. 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.

### Audience and prerequisites

The following audiences may be interested in earning the Red Hat Certificate of Expertise in Server Hardening:

- System administrators responsible for standards-compliant security on Red Hat Enterprise Linux systems
- System administrators responsible for security on Red Hat Enterprise Linux systems or who wish to harden systems beyond default configurations
- RHCEs who wish to earn [Red Hat Certified Architect \(RHCA\)](#).

### Prerequisites for this exam

- Be Red Hat Certified System Administrators or have comparable work experience and skills (Red Hat Certified Engineer would be even better)
- Have taken the [Red Hat Server Hardening \(RH442\)](#) course or have equivalent work experience
- Review the Red Hat Certificate of Expertise in Server Hardening exam (EX413) objective

### Course overview

Many security policies and standards require systems administrators to address specific user authentication concerns, application of updates, system auditing and logging, file system integrity, and more. Red Hat Server Hardening provides strategies for addressing specific policy and configuration concerns. This course can also help you prepare for the [Red Hat Certificate of Expertise in Server Hardening exam \(EX413\)](#). This version of the course includes the exam.

## Course content summary

- Review errata and apply them to Red Hat Enterprise Linux
- Use special permissions and file system access control lists
- Manage users and password-aging policy requirements
- Install and configure Red Hat Identity Management tools
- Understand system auditing

## Audience and prerequisites

- Needs technical guidance on how to enhance the security of Red Hat Enterprise Linux systems
- Responsible for implementing security policy requirements on Red Hat Enterprise Linux systems consistently and in a reproducible, scalable way
- Must be able to demonstrate that systems meet security policy requirements
- Maintains continued adherence to security requirements, including management of security-critical operating system/software updates
- RHCE-level skills highly recommended

## Prerequisites for this course

- Red Hat Certified Engineer (RHCE) certification, Red Hat Certified Systems Administrator (RHCSA) certification, or equivalent experience required
- For candidates who have not earned their RHCSA or RHCE certifications, confirmation of the required knowledge can be obtained by passing the [online skills assessment](#)

## Outline for this course

- **Track security updates**
- Understand how Red Hat Enterprise Linux produces updates and how to use yum to perform queries to identify what errata are available.
- **Manage software updates**
- Develop a process for applying updates to systems including verifying properties of the update.
- **Create file systems**
- Allocate an advanced file system layout and use file system encryption.
- **Manage file systems**
- Adjust file system properties through security related options and file system attributes.
- **Manage special permissions**
- Work with set user ID (SUID), set group ID (SGID), and sticky (SVTX) permissions and locate files with these permissions enabled.
- **Manage additional file access controls**
- Modify default permissions applied to files and directories; work with file access control lists.
- **Monitor for file system changes**
- Configure software to monitor the files on your machine for changes.
- **Manage user accounts**
- Set password-aging properties for users; audit user accounts.
- **Manage pluggable authentication modules (PAMs)**
- Apply changes to PAMs to enforce different types of rules on users.
- **Secure console access**
- Adjust properties for various console services to enable or disable settings based on security.
- **Install central authentication**
- Install and configure a Red Hat Identity Management server and client.
- **Manage central authentication**
- Configure Red Hat Identity Management rules to control both user access to client systems and additional privileges granted to users on those systems.
- **Configure system logging**
- Configure remote logging to use transport layer encryption and manage additional logs generated by remote systems.
- **Configure system auditing**
- Enable and configure system auditing.
- **Control access to network services**
- Manage firewall rules to limit connectivity to network services.
- **Note:** Course outline is subject to change with technology advances and as the nature of the underlying job evolves. For questions or confirmation on a specific objective or topic, please [contact a training specialist online](#) or at [1-866-626-2994](tel:1-866-626-2994).

## Recommended next exam or course

- [Red Hat Certificate of Expertise in Server Hardening exam \(EX413\)](#)