Red Hat Certified System Administrator (RHCSA) Cheat Sheet

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Disclaimer

Hi! This notes you're reading is an Alpha Release of the final notes, which should be ready for "the press" for June 2013. If you are reading this, most likely you have got to make editing.

If this is the case, please open an account on GitHub.com and send me your user on dicarlo.fabrizio@gmail.com. So that I can enable you to reading and edit the text version of the notes. You will find this version, once authorized, at: https://github.com/fdicarlo/RHCSA_cs

Thanks a lot for your edit!

Fabrizio.

Why this notes

Times ago some of my friends began to tell me to start the Red Hat Certification Program[1], I'm not a SysAdmin (I came from Engineering in Computer Science and I want to become a UX guy) but I know Linux and its power, I started to use it when I was 14 and now I'm 26, so I googled about it.

The Red Hat Certification Program are IT Professional certifications for Red Hat products and general Linux related skills such as system administration on Red Hat Enterprise Linux, all certifications are given after passing exams. The program distinguishes itself in that the exams are performance-based, meaning that students must perform tasks on a live system, rather than answering multiple choice questions.

RHCSA[2] is the entry-level certification that focuses on 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. To achieve the RHCSA certification the student must pass EX200, a half-day hands-on lab exam. The minimum passing score for the exam is 210 out of 300 possible points (70%). There is no prerequisite for the exam, but Red Hat recommends preparing for the exam by taking courses in Red Hat System Administration (RH124 or RH135) if one does not have previous experience. RHCSA was launched in 2002 as Red Hat Certified Technician (RHCT). As of July 2009 there were 30,000 RHCTs. In November 2010 it was renamed to RHCSA.

I googled also about some notes, Cheat sheet or books but except some valid books[3] these is nothing that I can't consult on my eBook's reader or that I can share with my friends, so I started to write a collaborative notes on GitHub.

Some details

As I said I'm not a SysAdmin but I'm simple Linux passionate, I wrote (and I'm writing) this ebook not for money but following my passion, my knowledge and the "Exam objectives" so, for sure, you can find some mistakes or something wrong, please send me a mail or update the notes.

[1] https://www.redhat.com/training/courses/

[2] https://www.redhat.com/training/courses/ex200/

[3] Michael Jang's RHCSA/RHCE Red Hat Linux Certification Study Guide (Exams EX200 & EX300) http://www.amazon.com/RHCSA-Linux-Certification-Study-Edition/dp/0071765654 and Damian Tommasino's Hands-on Guide to the Red Hat Exams: RHCSA and RHCE Cert Guide and Lab Manual http://www.amazon.com/Hands-Guide-Red-Exams-Certification/dp/0321767950

Red Hat Certified System Administrator (RHCSA) Exam objectives[4]

Red Hat reserves the right to add, modify, and remove objectives. Such changes will be made public in advance through revisions to this document.

RHCSA exam candidates should be able to accomplish the tasks below without assistance. These have been grouped into several categories.

Understand and use essential tools:

- Access a shell prompt and issue commands with correct syntax.
- Use input-output redirection (>, >>, |, 2>, etc.).
- Use grep and regular expressions to analyze text.
- Access remote systems using ssh and VNC.
- Log in and switch users in multiuser runlevels.
- Archive, compress, unpack, and uncompress files using tar, star, gzip, and bzip2.
- Create and edit text files.
- Create, delete, copy, and move files and directories.
- Create hard and soft links.
- List, set, and change standard ugo/rwx permissions.
- Locate, read, and use system documentation including man, info, and files in /usr/share/doc.

Note: Red Hat may use applications during the exam that are not included in Red Hat Enterprise Linux for the purpose of evaluating candidate's abilities to meet this objective.

Operate running systems:

- Boot, reboot, and shut down a system normally.
- Boot systems into different runlevels manually.
- Use single-user mode to gain access to a system.

[4] Red Hat Certified System Administrator (RHCSA) Exam objectives (EX200): https://www.redhat.com/training/courses/ex200/examobjective

- Identify CPU/memory intensive processes, adjust process priority with renice, and kill processes.
- Locate and interpret system log files.
- Access a virtual machine's console.
- Start and stop virtual machines.
- Start, stop, and check the status of network services.

Configure local storage:

- List, create, delete, and set partition type for primary, extended, and logical partitions.
- Create and remove physical volumes, assign physical volumes to volume groups, and create and delete logical volumes.
- Create and configure LUKS-encrypted partitions and logical volumes to prompt for password and mount a decrypted file system at boot.
- Configure systems to mount file systems at boot by Universally Unique ID (UUID) or label.
- Add new partitions and logical volumes, and swap to a system non-destructively.

Create and configure file systems:

- Create, mount, unmount, and use ext2, ext3, and ext4 file systems.
- Mount, unmount, and use LUKS-encrypted file systems.
- Mount and unmount CIFS and NFS network file systems.
- Configure systems to mount ext4, LUKS-encrypted, and network file systems automatically.
- Extend existing unencrypted ext4-formatted logical volumes.
- Create and configure set-GID directories for collaboration.
- Create and manage Access Control Lists (ACLs).
- Diagnose and correct file permission problems.

Deploy, configure, and maintain systems:

- Configure networking and hostname resolution statically or dynamically.

- Schedule tasks using cron.
- Configure systems to boot into a specific runlevel automatically.
- Install Red Hat Enterprise Linux automatically using Kickstart.
- Configure a physical machine to host virtual guests.
- Install Red Hat Enterprise Linux systems as virtual guests.
- Configure systems to launch virtual machines at boot.
- Configure network services to start automatically at boot.
- Configure a system to run a default configuration HTTP server.
- Configure a system to run a default configuration FTP server.
- Install and update software packages from Red Hat Network, a remote repository, or from the local file system.
- Update the kernel package appropriately to ensure a bootable system.
- Modify the system bootloader.

Manage users and groups:

- Create, delete, and modify local user accounts.
- Change passwords and adjust password aging for local user accounts.
- Create, delete, and modify local groups and group memberships.
- Configure a system to use an existing LDAP directory service for user and group information.

Manage security:

- Configure firewall settings using system-config-firewall or iptables.
- Set enforcing and permissive modes for SELinux.
- List and identify SELinux file and process context.
- Restore default file contexts.
- Use boolean settings to modify system SELinux settings.
- Diagnose and address routine SELinux policy violations.

Understand and use essential tools

Access a shell prompt and issue commands with correct syntax

This is first requirement should stop anyone who may not know, or may have never used a shell prompt from attempting the test. If you can open your terminal, navigate and type commands then you have accomplished this. If not, then you should check out the basics and start there.

Alternatively

Ctrl+Alt+F1 to **F6** are the virtual consoles provided by the getty/agetty programs. Ctrl+Alt+F7 is the console where your X server is running. The GUI (Gnome/KDE or any other) runs over X. So to get back into your GUI window manager: type: **Ctrl+Alt+F7**.

Use input-output redirection (>, >>, |, 2>, etc.)

Input output redirection is one of the base skills you will need as a sysadmin. On the exam you will have to be able to redirect data from one command into another, and/or into a file.

Some examples:

```
$ echo "this is input" > file.txt
```

or

```
$ cat /var/log/messages | less
```

You can easily redirect input / output to any file other than the screen. This is achieved in Linux using input and output redirection symbols:

- ">" Output redirection
- "<" Input redirection

Using a combination of these symbols and the standard file descriptors you can achieve complex redirection tasks quite easily.

- ">" overwright
- "<" send into a command or file

- ">>" append
- "<<" append into a command or file
- "|" funnel into
- "2>" redirect errors
- "2>&1" redirect errors to std out

Use grep and regular expressions to analyze text

RHCSA requirements state that you must know how to use grep to analyze text. This is actually going to be pretty necessary to do many administration tasks on a daily basis.

Grep returns any lines that have characters, words, or expressions that match your query.

Basic usage examples of this include:

- Find "Permission Denied" entries in a log file

  $ grep -r "Permission Denied" /path/to/logfile/

- Find "Permission Denied" entries in a log file by using output redirection

  $ cat /path/to/file/ | grep "Permission Denied"

Access remote systems using ssh and VNC.

Log in and switch users in multiuser runlevels.

Archive, compress, unpack, and uncompress files using tar, star, gzip, and bzip2.

Create and edit text files.

Create, delete, copy, and move files and directories.

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