

UNIVERSITY OF HAWAI'I AT MĀNOA

APT Career and Professional Development
Completion Report

Please answer all questions. Please send the completed report (via supervisor/dept. chair, dean/director) to Mānoa HR, Hawai'i Hall 102.

Name: John Troy Ludwick Position Title: IT Spec.
Dept.: Mathematics Office Phone #: 956-6095 Email: troy@math.hawaii.edu

Event/Activity: RH 300 Red Hat Rapid Track Course (and RHCE Exam)
Location: Las Vegas, NV Date(s) of Event/Activity: 12/10/07 - 12/14/07

Please provide a brief description about the event/activity in the space below (or as an attached document).

1. Please describe the event/activity:

Please see attached document.

2. How did attending the event/activity contribute to your professional development?

Please see attached document.

3. Please describe the benefits accrued from attending this event/activity and include knowledge gained:

- a. What did you expect to gain from the event/activity?

Please see attached document.

b. Did the event/activity meet your expectations? How?

Please see attached document.

4. How will the information that you have gained be used in your department and/or by others?

Please see attached document.

5. Would you recommend this event/activity to others? Why or why not?

Please see attached document.

Additional comments:

John Gray Ludwig 1/10/08
Applicant Signature Date

I have read and reviewed the above information.

Wayne Smith 1/10/08
Supervisor Signature Date

Wayne Smith 1/10/08
Dept. Chair Signature, as applicable Date

Thomas Cox 1/11/08
VC, as applicable/Dean/Director Signature Date

Incomplete and/or unsatisfactory reports will not be accepted. If incomplete and/or unsatisfactory reports are submitted, the APT employee may be required to return awarded funds to the APT Career and Professional Development and the APT employee may not be considered for development fund support in the future.

APT Career and Professional Development Completion Report - Attachment I

Description of Event/Activity

1. Please describe the event/activity:

The RH300 course consists of four days of training followed by the RHCE certification exam on the fifth day. The training covers many topics for which a Linux/Unix administrator must have familiarity. However the training was not intended as a cram course for the RHCE certification exam. Not everything required to pass the exam was covered in the training, and some topics that were covered were not listed as requirements for the RHCE. For most topics the training focused on advanced level configuration and troubleshooting.

Among the topics covered, some of the more noteworthy included kernel tuning, iptables firewalls, SELinux, virtual hosts, advanced use of file system ACLs, LVM and software RAID, package management, print server management, and PAM authentication. In addition the training covered configuration and troubleshooting for the following network services: SMTP, IMAP, POP3, HTTP, DNS, DHCP, NTP, FTP, NFS, NIS, SSH, and Samba. For each topic, the training was followed by hands on labs to reinforce the material, and advanced labs were assigned to those who finished the regular labs early. The afternoon of the final day of training was devoted to hands on troubleshooting of broken systems.

The certification exam consists of two parts. The morning session is troubleshooting and system maintenance, and the afternoon is installation and configuration. For the troubleshooting and maintenance session I was given a total of eight questions, each of which consisted of fixing one or more problems on a live (broken) system. The problems ranged from moderately difficult errors in network or service configurations to advanced difficulty errors in multiple core system files and the boot loader which rendered the system unbootable. I was given 2 1/2 hours, and the first four problems had to be resolved within the first hour. A total score of 80% was required to pass the morning session.

For the installation and configuration portion of the exam, I was given 3 hours to install and configure a working server starting with a blank formatted hard drive and an installation CD. I was given a list of specifications and criteria by which success for a particular objective would be measured. The list was very long and included almost everything covered in training, many things not covered in the training, and advanced configuration of around 10 server services. Each such service required user access controls, host access controls, and/or kernel or SELinux protections or controls. This session was also split in two parts, and the first portion had to be completed within the first two hours. A total of 70% on each of the two sections was required to pass the afternoon session.

2. How did attending the event/activity contribute to your professional development?

First, by attending the RH300 course I succeeded in passing the certification exam and attaining the RHCE certification. In itself this is a worthwhile accomplishment, and the required preparation served to sharpen, reinforce, and expand my professional system administration skills. In turn I can devote more resources to expanding on what I learned and acquiring additional skill sets.

My professional development is additionally furthered by enabling me to pursue other certifications for which the RHCE is requisite. I intend to advance my professional development by seeking the RHCSS (Red Hat Certified Security Specialist), possibly followed by the RHCA (Red Hat Certified Architect). To obtain the RHCSS one must pass a Network Services Security Expertise Exam, a Directory Services and Authentication Expertise Exam, and an SELinux Policy Administration Expertise Exam. To obtain the RHCA, one must pass a further three examinations (over the requirements of the RHCSS). The RHCSS and RHCA are more suited to and a better reflection of my actual skill set, ability, and proficiency. However one must possess the RHCE before being allowed to pursue the RHCSS or RHCA, so obtaining my RHCE is an important stepping stone toward advancing the development of my professional skills.

3. Please describe the benefits accrued from attending this event/activity and include knowledge gained:

a. What did you expect to gain from the event/activity?

I expected to reinforce and improve my professional skills in all facets of system and network administration. I further expected to acquire and broadly reinforce my professional skills with newer technologies such as SELinux and implementation of virtual hosts. Lastly I expected to gain the RHCE in furtherance of my goal of attaining higher levels of certification.

b. Did the event/activity meet your expectations? How?

Each of my expectations was met. During my preparation I reviewed and practiced all system administration skills requisite for the RHCE from the rudimentary to the advanced. Once I attained proficiency for a particular skill I repeatedly practiced implementing the skills in conditions closely mimicking the actual certification exam conditions. I additionally gained new skills in areas such as virtual hosts, SELinux, LVMs, and Linux software raid as expected. Finally, I attained the RHCE certification by achieving a perfect score on the certification exam, thereby enabling me to pursue certificates of expertise in the areas of specialization mentioned previously.

4. How will the information that you gained be used in your department and/or by others.

The information gained will benefit the department by facilitating improved and/or new services and support for our users. As an example, we employed a virtual host solution to provide expanded web based services requested by professors. This affords them the ability to deploy wikis, content management systems, and web based coursework. While these use newer and arguably insecure technologies, by implementing them on virtual hosts we can offer them without added hardware costs and with minimum risk of adversely affecting our production web server and its sensitive data. As another example we now routinely enable SELinux on our Linux servers and clients. On the servers this helps secure data by insulating potential vulnerabilities in one service from another. On the clients, SELinux helps enable access controls for end users. This allows us to give end users enhanced privileges on their client system while ensuring that the data of all other users remains private. The enhanced privileges benefit the end users by letting them perform tasks such as package management, advanced configuration, and controlling system hardware without seeking administrator assistance. These examples illustrate how the information I gained can help expand our service offerings.

Support functions should also benefit. I am now better prepared to troubleshoot, diagnose, and resolve issues such as system crashes and hardware failures. I also have additional resources available for troubleshooting advanced configuration and management problems. In combination with the strengthening of my basic administration skills, these should serve to maintain quality end user support and minimize system down times.

5. Would you recommend this event/activity to others? Why or why not?

I would recommend this activity to others whose job duties include Linux or Unix system administration. While the course is specific to Red Hat Linux, the vast majority of skills required for the RHCE apply broadly to other Linux and Unix distributions. The instructor was highly knowledgeable and the printed course materials are a valuable reference containing a lot of advanced information as well as the hands on practice labs. Additionally, those who successfully obtain the RHCE gain access to additional Red Hat support forums and other online community resources. These are only available to RHCEs, and they can be very valuable for purposes of advanced troubleshooting.

However, while the course has value it is not a substitute for actual on the job experience and performance under real world adverse conditions. As such this course is most suited for those who have existing intermediate to advanced administration skills. Novice and less experienced administrators would likely be better served by taking introductory Red Hat courses or other avenues of training.

Additional Comments:

I would like to thank the APT Career and Professional Development Committee and the Office of the Chancellor for partially funding my endeavor to obtain the RHCE. I would also like to thank former Mathematics Dept. Chair Tom Craven for supporting and partially funding my attempt as well as former Dean Hayes for his support my application. Without this consideration and support I would not have achieved my goal. I found the course to be rewarding, and I expect that the University's investment will be recouped through the implementation of attained skills.

I am attaching a copy of my Certification Lab Exam results notification. Red Hat encourages employers and interested parties to verify the authenticity and validity of an RHCE certificate by checking the certificate number on their web site. One may do so by visiting: <https://www.redhat.com/training/certification/verify> and entering my certification number (805007617229585).

APT Career and Professional Development Completion Report - Attachment II

Copy of RHCE Certification Lab Exam Results

Subject: Certification Lab Exam results

From: Red Hat Certification Central <noreply@redhat.com>

Date: Fri, 14 Dec 2007 19:25:49 -0500

To: John Troy Ludwick <troy@math.hawaii.edu>

Dear John Troy Ludwick:

The results of your RHCE Certification Exam are reported below. The RHCE Certification Exam allows candidates to qualify for the Red Hat Certified Engineer (RHCE) and Red Hat Certified Technician (RHCT) certificates. Please note that the RHCE designation is understood to both include and supersede the RHCT designation.

SECTION I: TROUBLESHOOTING AND SYSTEM MAINTENANCE

RHCE requirements: completion of compulsory items (50 points)
overall section score of 80 or higher

RHCT requirements: completion of compulsory items (50 points)

Compulsory Section I score: 50.0
Non-compulsory Section I score: 50.0
Overall Section I score: 100

SECTION II: INSTALLATION AND CONFIGURATION

RHCE requirements: score of 70 or higher on RHCT components (100 points)
score of 70 or higher on RHCE components (100 points)

RHCT requirement: score of 70 or higher on RHCT components (100 points)

RHCT components score: 100.0
RHCE components score: 100.0

RHCE Certification: PASS

Congratulations -- you are now certified as a Red Hat Certified Engineer! Your RHCE Certificate number is 805007617229585. The attached file is your personal print-ready certificate. If your name does not appear correctly please go to <https://www.redhat.com/training/certification/comments.html>, and send us a note including your certificate number and your name typed as it should appear and we will send you a modified version of the certificate.

You are entitled to print this document and use it to demonstrate that you are an RHCE, provided you remain an RHCE in good standing. You may not modify or change the document's contents in any way, nor may you appropriate any elements of this document for use in other electronic documents or printed materials. You may only print the document in its entirety. Any other use of the document must be approved by Red Hat, Inc.

Your RHCE number should be available for verification at Red Hat Certification Central:

http://www.redhat.com/training/certification/verify/?rhce_cert_display:certno=805007617229585&rhce_cert_display:verify_cb=Verify

You can verify the certificates of other RHCEs and RHCTs at

<https://www.redhat.com/training/certification/verify>

Please visit RHCE Connection, our web site exclusively for RHCEs:

<https://www.redhat.com/training/certification/>

There you will find special offers from Red Hat, logo art, forums, job listings, and more. You can also use the site to manage your contact information. In order to access the site, you will need a PIN number. You can have the PIN sent to the email address we have on file at

<https://www.redhat.com/training/certification/lostpin.html>

If you wish to connect to the forums directly:

<https://trainingforums.redhat.com>

Certification in Red Hat Enterprise Linux opens up new opportunities. We hope you will keep Red Hat updated with your experiences and successes with Red Hat Enterprise Linux.

Please feel free to contact us with ideas and suggestions as to ways we can enhance our Red Hat Enterprise Linux training and certification programs at

<https://www.redhat.com/training/certification/comments.html>

Thank you very much for your interest in Red Hat Enterprise Linux!

Red Hat Certification Central

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