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Red Hat Enterprise Linux 7

Break-fix Practice 1

BREAK-FIX TRAINING
Completion of this content requires solving a problem that's simulated in a hands-on lab environment.

Course: CEE-CB-002

Version: February 2020

Description: This break-fix training simulates a problem booting Red Hat Enterprise Linux 7 (RHEL 7) when multiple systemd daemons are reported as dead following a system update. You'll investigate and solve the problem in a hands-on lab environment to complete the training.

How to use this module:

- Look for gray < and > marks on either the bottom or the left and right sides of this pane, depending on the size of the window. Click those to navigate to the previous or next page, respectively.
- Jump to a specific page using the navigation links at the left.
- Play audio for a page using the player at the top of that page. Audio often provides more complete information than the text and graphics alone. A transcript is available from a link on the same page.

In this break-fix:

Type of issue: Booting RHEL 7 when multiple *systemd* daemons are reported as failed following a system update.

What you should already know:
This training assumes that you are a Red Hat Certified System Administrator (RHCSA) or have equivalent experience administrating Red Hat Enterprise Linux 7.

How break-fix training works:

1. Challenge yourself in the **Break-fix Activity**. It describes a problem scenario that's simulated in the lab environment where you can investigate and solve the problem.
2. Follow up with the **Guided Solution**:
    - If you couldn't solve the problem on your own, read and follow the instructions in the Guided Solution to complete this training.
    - If you were successful solving the problem, read the solution for useful tips you can apply when solving similar problems.

Lab Environment

Successful completion for this training includes hands-on lab activities hosted in a cloud-based lab environment.

PROVISIONING

(1) Log in to the OpenTLC lab portal.

(2) On the far left, mouse over **Services** and select **Catalogs** from the pop-up menu.

(3) Select to expand **All Services** and **Support Labs**.

(4) Select **cee-cb-002** under that list.

(5) Select **Order**.

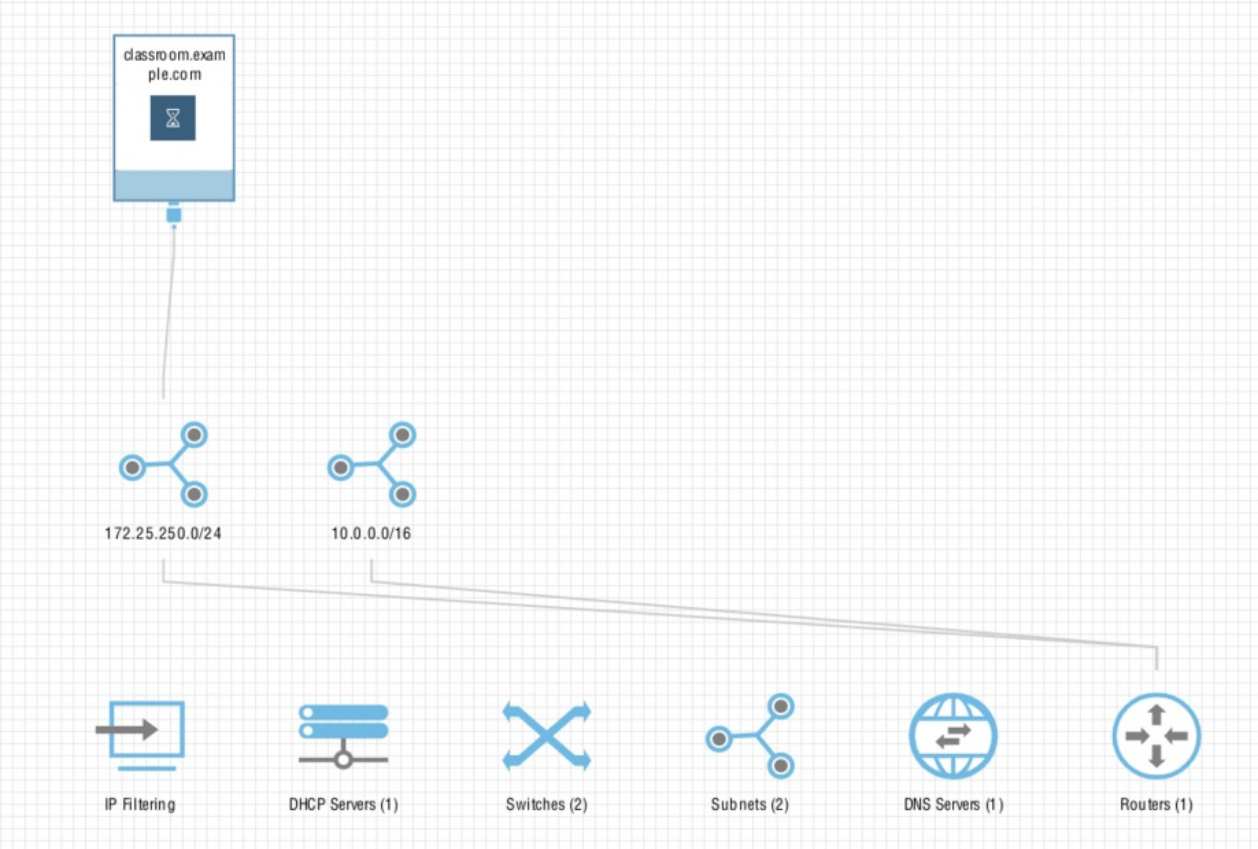
(6) Complete the application request: read the **Runtime Warning**, check the box to confirm the runtime and expiration dates, and select **Submit**.

IMPORTANT: Expect **up to 20 minutes** to provision your lab environment.

(7) Look for information on how to access your lab environment from one of two places:

- **Information email**
  Look for an email from *Red Hat OPENTLC <noreply@opentlc.com>* with the Subject similar to: *Your Red Hat OPENTLC service provision request for OTLC-LAB_COMPLETED has completed.* This email may arrive before the environment is ready to use. If you don't receive this email within 15 minutes, you can generate a new one from OpenTLC: **Services > Active Services > OTLC-LAB-NAME* > App Control > Status > Submit**
- **The OpenTLC UI**
  Look in the *Custom Attributes* section on the right in OpenTLC: **Services > Active Services > OTLC-LAB-*NAME***

SYSTEM INFO



System	IP	Credentials	Description
classroom	172.25.250.254	student/redhat, root/shamrock masher positron tweet	Central SSH access point, provides DNS and DHCP services for other systems

SSH ACCESS

(1) Use the SSH command shown here to access your environment, modifying the command based on the information you received by email:

```
$ ssh flastname-redhat.com@classroom-guid.red.osp.opentlc.com
```

(2) When prompted, log in to your lab environment using one of these options:

- A password set by OpenTLC and provided in the information email.
- An SSH key pair configured as described here: http://www.opentlc.com/ssh.html

```
$ ssh flastname-redhat.com@classroom-guid.red.osp.opentlc.com
The authenticity of host 'classroom-guid.red.osp.opentlc.com (169.47.191.199)' can't be established.
ECDSA key fingerprint is SHA256:v01n4XWXr0lphfGpBiSSvbasmrlQZul2ntS8g0Kbmdk.
Are you sure you want to continue connecting (yes/no)? yes

flastname-redhat.com@classroom-guid.red.osp.opentlc.com's password: <PASSWORD>

[flastname-redhat.com@classroom-guid ~]$ sudo su -
Last login: Thu Oct 24 14:19:41 EDT 2019 from 61.0.147.106 on pts/0
[root@classroom-guid ~]#
```

CONSOLE ACCESS

If you need console access to any of the machines in this environment, follow these steps:

(1) Retrieve the **Master Console** URL from the information email you received on provisioning your lab environment. Look for a line that's similar to this one:

```
Master Console: https://console-redvnc.apps.shared.na.openshift.opentlc.com
```

(2) Open this console URL in your web browser, and select **Log in with OpenShift**.

(3) Enter your OpenTLC username and password at the OpenShift login prompt.

(4) If a dialog appears requiring you to *Authorize Access* for a service account, choose to allow the selected permissions to continue.

(5) Select **Access Console** for a given virtual machine to open a VNC console session with that system.

LOCAL WEB BROWSER ACCESS (HOSTED WEB UI)

(1) Use the same *ssh* command from your local system as for command line access, but add the argument **-CfND 8080**

```
[user1@laptop ~]$ ssh flastname-redhat.com@classroom-guid.red.osp.opentlc.com -CfnND 8080
```

(2) Configure your local web browser to send all web traffic through **localhost:8080**.

```
[user1@laptop ~]$ google-chrome --proxy-server="socks5://127.0.0.1:8080" --host-resolver-rules="MAP * 0.0.0.0 , EXCLUDE localh
ost" &
```

▼ Show transcript

Successful completion for this training includes hands-on lab activities. Use the information on this page to launch you cloud-based lab environment, locate the URLs and credentials to access that environment, familiarize yourself with the network setup, and use SSH or a local web browser to access lab systems.

Break-fix Activity

This section presents a scenario based on a real customer issue.

1. Read the scenario and success criteria.
2. Follow any instructions provided for setting up your lab environment.
3. Resolve the issue as simulated in your lab environment.
4. After resolving the issue, run the grading script and submit the completion code as prompted.

You must successfully complete this section to receive a passing grade for this module.

If you have exhausted your experience and resources, and you're unable to solve the issue on your own, use the Guided Solution to learn one possible way to resolve the issue, with tips for addressing similar issues.

Scenario & success criteria

SCENARIO

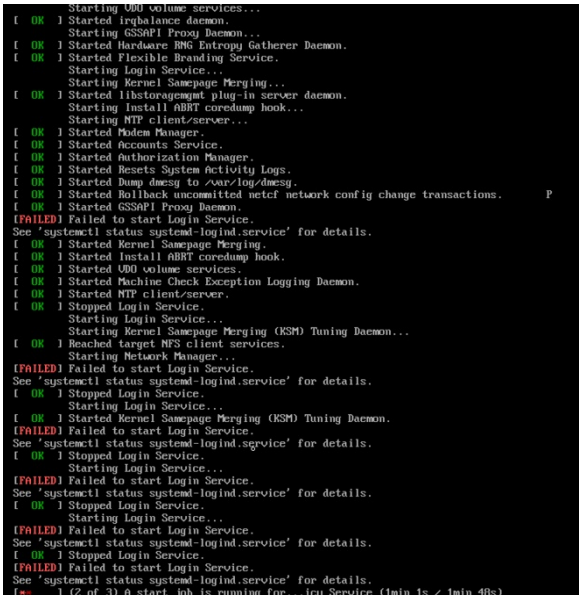
Your team manages Red Hat Enterprise Linux 7 updates for your organization. After updating a system from RHEL 7.0 to RHEL 7.6, you notice that you're not able to restart any systemd daemons.

When you restart any systemd daemon, you see the error message shown here:

```
# systemctl restart NetworkManager
Error getting authority: Error initializing authority: Could not connect: No such file or directory (g-io-error-quark, 1)

# systemctl restart sshd
Error getting authority: Error initializing authority: Could not connect: No such file or directory (g-io-error-quark, 1)
```

Because the update included kernel update, your team reboots the server to run the new kernel. However, the system no longer boots successfully. Instead, the boot hangs with error logs as shown in this screen capture (select image to view at full size):



To address the issue, you've decided to boot the system in rescue mode and investigate further.

SUCCESS CRITERIA

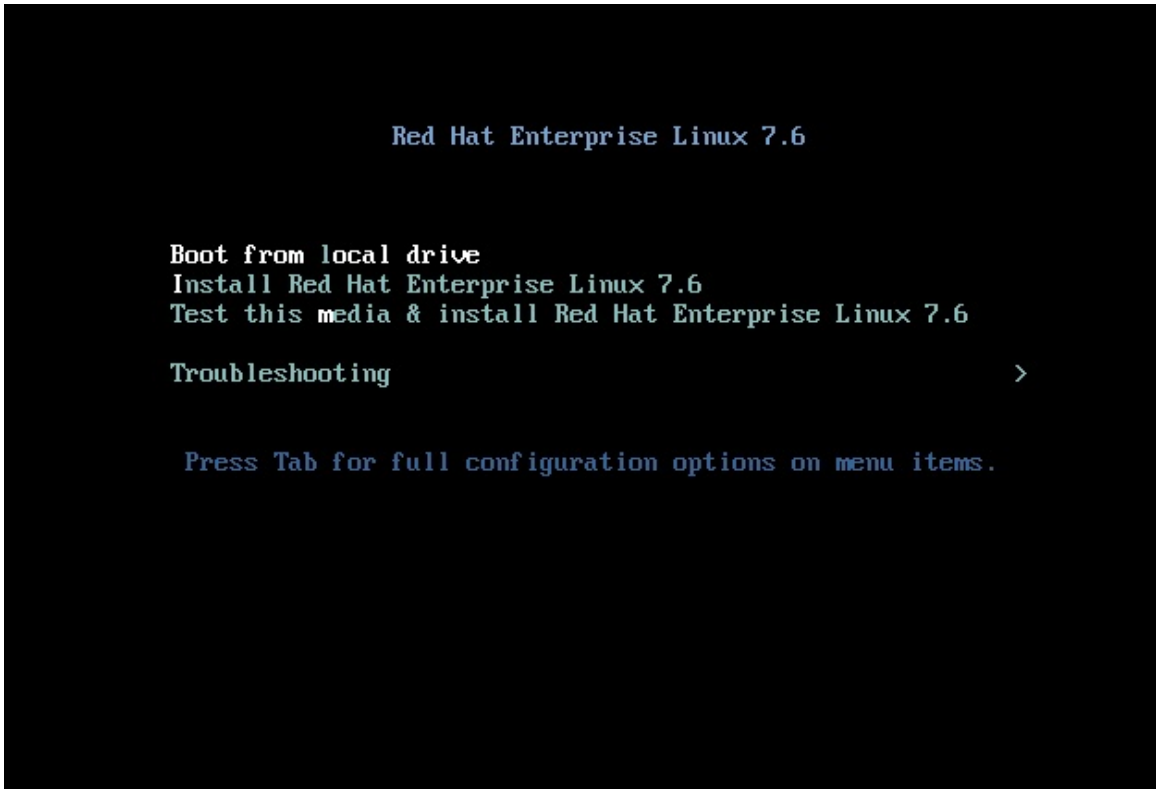
After you investigate and solve the issue, the system should boot and run without errors at the *graphical.target* runlevel, and the root user should be able to connect to the system using SSH.

Setup instructions

After you launch your lab environment, follow these setup instructions for the break-fix scenario:

(1) Get VNC console access to the ***classroom*** system using the *Console Access* instructions on the Lab Environment page.

(2) Confirm that the system automatically boots to the RHEL 7 DVD that's attached to the system, and that the screen looks like the image here:



(3) Sign in to the system as the root user over SSH, then run ***cee-cb-002 break*** as shown here. This simulates the patch from RHEL 7.0 to RHEL 7.6, which broke the system in our scenario:

```
[root@classroom ~]# cee-cb-002 break
Initiating cee-cb-002 with option break
Applying break....    DONE
Your system has been modified.
Completed cee-cb-002 with option break successfully
```

(4) Run this command to restart the *NetworkManager* daemon, and, if the command is taking more than a few seconds to exit, press Ctrl+C to stop the process:

```
[root@classroom ~]# systemctl restart NetworkManager
Authorization not available. Check if polkit service is running or see debug message for more information.
^C
```

(5) Reboot the system, and confirm that you see the same error message as shown here:

```
[root@classroom ~] reboot
Authorization not available. Check if polkit service is running or see debug message for more information.
```

(6) When you reboot the system, confirm that you see similar errors reported in the scenario (time stamps and exact error messages may differ).

(7) Proceed with investigating and solving the issue to meet the given success criteria.

Check your work

After you have resolved the issue and met the success criteria, run the grading script as shown here to receive a completion code:

```
[root@classroom ~]# cee-cb-002 grade
Initiating cee-cb-002 with option grade
Grading.  Please wait.
Success.
COMPLETION CODE: <check your output for this value>
Completed cee-cb-002 with option grade successfully
```

Submit that completion code here to receive a grade for this training:

> COMPLETION CODE provided by *cee-cb-002 grade*: _____
>
> ans: OMIT

Guided Solution

This section presents a guided solution to the Break-fix Activity.

Use this section to:

- Learn one possible path to resolving the customer issue.
- Get some tips for investigating and resolving similar issues.

If you're still stuck after exhausting your expertise and resources on the Break-fix Activity:

- Use this solution to complete the activity.
- Check your work when you finish.

Solution (1 of 4)

(1) Confirm that some daemons are reporting as failed as shown in the screen capture from the scenario. Here's a look at that screen capture, though note some values on your lab screen will be different:

Solution (2 of 4)

(2) Boot the system to rescue mode, where you can investigate the cause of these failures.

For your reference: How to boot a system into rescue mode

(3) In rescue mode, use *chroot* to change to the root partition of your file system:

```
# chroot /mnt/sysimage
```

(4) Study the most recent *NetworkManager* error logs for clues:

```
# journalctl -u NetworkManager | grep error
Jan 30 04:11:27 classroom.example.com NetworkManager[3140]: <error> [1580375487.7514] dispatcher: could not get dispatcher pro
xy! Could not connect: No such file or directory
Jan 30 04:11:28 classroom.example.com NetworkManager[3140]: <error> [1580375488.3392] auth: could not create polkit proxy: Cou
ld not connect: No such file or directory
Jan 30 04:11:28 classroom.example.com NetworkManager[3140]: <error> [1580375488.4552] pacrunner: failed to create D-Bus proxy
for pacrunner: Could not connect: No such file or directory
Jan 30 04:12:57 classroom.example.com NetworkManager[3530]: <error> [1580375577.7677] dispatcher: could not get dispatcher pro
xy! Could not connect: No such file or directory
Jan 30 04:12:57 classroom.example.com NetworkManager[3530]: <error> [1580375577.8370] auth: could not create polkit proxy: Cou
ld not connect: No such file or directory
Jan 30 04:12:57 classroom.example.com NetworkManager[3530]: <error> [1580375577.8626] pacrunner: failed to create D-Bus proxy
for pacrunner: Could not connect: No such file or directory
-...
```

Notice that the logs mention this error:
failed to create D-Bus proxy for pacrunner: Could not connect: No such file or directory

(5) Use *busctl* to check whether D-Bus is working correctly:

```
# busctl
Failed to connect to bus: No such file or directory
```

Note

In some situations, you may notice the error "Failed to connect to bus: Connection refused" in the *busctl* output.

What can be causing this error?

(6) Run *strace* on the *busctl* command to get some additional information. Shown here is the last 7 lines of our example output:

```
# strace busctl
....
getsockopt(3, SOL_SOCKET, SO_SNDBUF, [212992], [4]) = 0
setsockopt(3, SOL_SOCKET, SO_SNDBUFFORCE, [8388608], 4) = 0
connect(3, {sa_family=AF_LOCAL, sun_path="/var/run/dbus/system_bus_socket"}, 33) = -1 ENOENT (No such file or directory)
close(3)                                = 0
writev(2, [{"Failed to connect to bus: No suc"..., 51}, {"\n", 1}], 2Failed to connect to bus: No such file or directory
) = 52
exit_group(1)                           = ?
+++ exited with 1 +++
....
```

In this *strace* output, the system reports */var/run/dbus/system_bus_socket* as missing.

Solution (3 of 4)

(8) Check whether the parent directories on that missing page */var/run* and */var/run/dbus* are present on the system:

```
# ls -ld /var/run
drwxr-xr-x. 3 root root 112 Dec 30 23:39 /var/run

# ls -ld /var/run/dbus
ls: cannot access /var/run/dbus: No such file or directory
```

From the output, you can see that */var/run/dbus* is missing. Start resolving the issues on the system by recovering */var/run/dbus*.

You see that */var/run* exists, but the missing subdirectory calls into question the integrity of its parent directory. Investigating that integrity is the path we'll take for investigating the missing subdirectory.

(9) Use this *rpm* command to check what package provided the file */var/run*:

```
# rpm -qf /var/run
filesystem-3.2-25.el7.x86_64
```

(10) Next, use this *rpm* command to check the integrity of the *filesystem* package to confirm if */var/run* is altered in any way.

```
# rpm -V filesystem
.M.......  g /var/run
```

In this output, notice that */var/run* has had its permission or file type modified.

(11) Use this *rpm* command to check whether there are any scripts executed by the *filesystem* package. Scripts may help us recover something that's missing:

```
# rpm -q --scripts filesystem
...
...
posix.mkdir("/run")
posix.symlink("../run", "/var/run")
posix.symlink("../run/lock", "/var/lock")
...
...
```

Solution (4 of 4)

The script output indicates that */var/run* is actually a symbolic link to */run* and not a directory on its own.

(12) Recreate that link as shown here:

```
# ls -ld /var/run
drwxr-xr-x. 3 root root 112 Dec 30 23:42 /var/run

# rm -rf /var/run

# cd /var

# ln -s ../run

# ls -ld /var/run
lrwxrwxrwx. 1 root root 6 Dec 30 23:43 /var/run -> ../run
```

(13) Recheck the *filesystem* package integrity to confirm if you've recovered */var/run/*:

```
# rpm -V filesystem
```

TIP: It's best practice to check whether you've resolved an issue after one change without making any further checks or changes.

(14) While still in rescue mode, run *busctl* to confirm whether this fix was able to get D-Bus is working:

```
# busctl
```

(15) Exit from rescue mode, and use *Boot with local disk* from the boot disk.

(16) **Check whether you've met the success criteria** to confirm that no other action is required to resolve this issue:

- The system appears to boot normally to the *graphical.target* runlevel.
- The root user can sign in using SSH.

(17) Return to Check your work and follow the instructions to run the grading script and submit the completion code.

Resources

This list includes content referenced during research for this training as well as links you can use for ongoing reference or additional learning:

How to boot a system into rescue mode

RHEL7: after updating dbus from dbus-1.6.12 to dbus-1.10.24, the system is broken

Feedback

Thank you for taking time to provide your feedback on this training using the form below.

How likely are you to recommend this training module to other associates?

Not at all Likely ○0 ○1 ○2 ○3 ○4 ○5 ○6 ○7 ○8 ○9 ○10 Extremely likely

Based on your learning experience, this module:

- ☐ Did not cover the stated objectives
- ☐ Had bug(s) in the learning environment
- ☐ Had bug(s) in the written content
- ☐ Was too long
- ☐ Was too short
- ☐ Had engaging multimedia interactions
- ☐ Had no blocking issues

Enter additional comments here...

Submit FeedbackReset