



**Hewlett Packard**  
Enterprise

# **HPE Cray EX Series System Administration with HPE Performance Cluster Manager**

Lab exercise OS boot modes and root file system modes

## Boot compute node with tmpfs root file system

1. Open a terminal session to the admin node.
2. Query the compute node /proc/cmdline for its ROOTFS value:

```
ssh x3019c0s17b0n2 cat /proc/cmdline
```

Look for the ROOTFS attribute.

3. Query the compute node mounted file systems for the root file:

```
ssh x3019c0s17b0n2 df -h
```

Look for the Filesystem entry for /.

4. On the admin node, determine the root file system mode that a compute (non-ICE, flat, service) and leader nodes is scheduled to boot with (the node name contains a zero character 0; the option contains an uppercase letter O):

```
cm node show -Oj -n x3019c0s17b0n2,x3019c0s31b0n0
```

Look for the rootFs and bootOrder entries.

5. On the admin node, determine the root file system mode that compute and leader nodes are scheduled to boot with and filter the output:

```
cm node show -O | cut -b 1-60
```

6. Ensure that your node is under the management of one of the SU leaders:

```
cm node show -n <node> --su-leader
```

7. Determine the IP address of your compute node:

```
grep <node> /etc/hosts
```

The IP address for the iLO device is the IP address on the head-bmc network with the <node>-bmc alias.

8. Set the node to PXE boot: coordinate with your labgroup members—one person prepare the compute nodes to PXE boot.

```
ilorest bootorder --continuousboot=pxe -u root -p initial0 --url=<iLO IP> --commit
```

9. Reboot the node.

```
cm power reboot -t node <node>
```

10. Confirm that your labgroup assigned node is under the management of an SU leader (replace <node> with the name of your assigned node):

```
cm node show --su-leader -n <node>
```

11. In your labgroup, the series of commands with other NFS root file system modes:

- replace <node> with the name of your assigned node
- monitor node boots with the console or with tail -f /var/log/containers/<node>

- each time you reboot the node wait several minutes for the OS boot to complete
- in `cat /proc/cmdline` output, look for the ROOTFS, NFS\_WRITABLE\_TYPE entry if NFS the ROOTFS option, and the SU\_LEADER attributes
- in `df -h` output, inspect the Filesystem entry associated with `/` and any `.rw` or `/rootfs.rw` entries

```
cm node set --rootfs nfs --writable nfs-overlay -n <node>
```

```
cm node show -n <node> -O | cut -b 1-60
```

```
cm power reboot -t node <node>
```

```
ssh <node> cat /proc/cmdline
```

```
ssh <node> df -h
```

```
cm node set --rootfs nfs --writable tmpfs-overlay -n <node>
```

```
cm node show -n <node> -O | cut -b 1-60
```

```
cm power reboot -t node <node>
```

```
ssh <node> cat /proc/cmdline
```

```
ssh <node> df -h
```

12. Configure a compute (non-ICE, flat, service) node to boot into disk root file system mode:

```
cm node set --rootfs disk -n <node>
```

13. Review the changed root file system mode in the Rootfs column:

```
cm node show -n <node> -O | cut -b 1-60
```

14. Reboot the compute node with disk root file system.

```
cm power reboot -t node <node>
```

15. Wait a few minutes for the compute node to reboot.

16. Query the compute node `/proc/cmdline` for its ROOTFS value:

```
ssh <node> cat /proc/cmdline
```

17. Query the compute node mounted file systems for the root file:

```
ssh <node> df -h
```

## Review shared storage file systems in cluster with SU leader nodes

On the admin node, review shared SU leader related file systems in the cluster.

```
df -h | egrep 'cm|ctdb|Filesystem'
```

```
ssh leader1 df -h | egrep 'cm|ctdb|Filesystem'
```

```
ssh leader2 df -h | egrep 'cm|ctdb|Filesystem'
```

```
ssh leader3 df -h | egrep 'cm|ctdb|Filesystem'
```

This completes lab exercise OS boot modes and root file system modes.