Lab A2: Filesystems, Storage, and LVM on Red Hat Enterprise Linux

Ayoub Zouargui
Master 1 – Networks and Embedded Systems
University of Algiers 1 (2025–2026)
https://github.com/AyoubSci

Objective

The objective of this lab is to understand and implement enterprise-grade storage management on Red Hat Enterprise Linux (RHEL). The lab focuses on disk identification, partitioning, Logical Volume Manager (LVM) configuration, filesystem creation, and persistent mounting. Emphasis is placed on safe storage practices commonly used in production environments.

Lab Environment

The lab was conducted using the following setup:

Operating System: Red Hat Enterprise Linux

Administration Node: `rhel-admin`

Server Node: `rhel-server1`

Access Method: SSH from administration node

All storage-related operations were performed on the server node (`rhel-server1`). The administration node was used only for access and verification.

Enterprise Context

In enterprise environments, application data is stored on dedicated disks separate from the operating system. This approach improves system reliability, simplifies maintenance, and reduces the risk of data loss. Logical Volume Manager (LVM) is commonly used to provide flexible storage management, allowing volumes to be resized or reorganized without service disruption.

Tasks Performed

Disk Identification and Preparation

A secondary virtual disk was added to the server node to simulate a dedicated data disk. The disk was identified using standard Linux tools, ensuring that the system disk was not modified.

Partitioning and LVM Configuration

The new disk was partitioned and prepared for use with LVM. A physical volume was created, followed by a volume group to pool available storage. Logical volumes were then allocated for different purposes, representing project data and backup storage.

Filesystem Creation and Mounting

Each logical volume was formatted with the XFS filesystem. Dedicated mount points were created and the filesystems were mounted accordingly. Persistent mounting was configured to ensure availability after system reboots.

Verification

The configuration was verified by inspecting disk layout, LVM structure, and mounted filesystems. The following screenshots provide evidence of successful implementation.

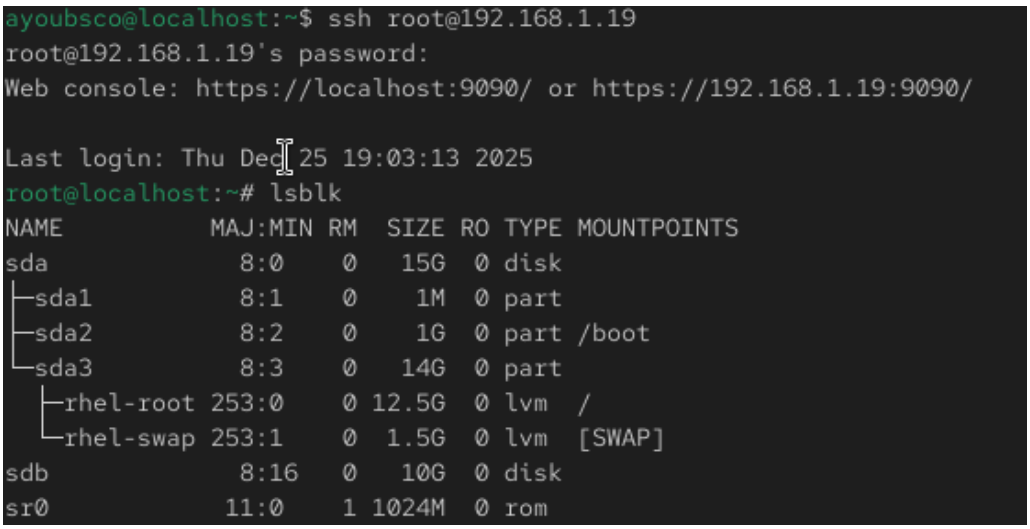

Figure 1: Disk layout showing system disk and additional data disk

Lessons Learned

This lab demonstrated the importance of separating system and data storage in Linux servers. Using LVM provides flexibility and scalability, which are critical requirements in enterprise systems. Proper verification steps are essential to ensure that storage configurations are correct and persistent.

Conclusion

Through this lab, enterprise storage management concepts were successfully applied on Red Hat Enterprise Linux. The resulting configuration reflects common practices used in production

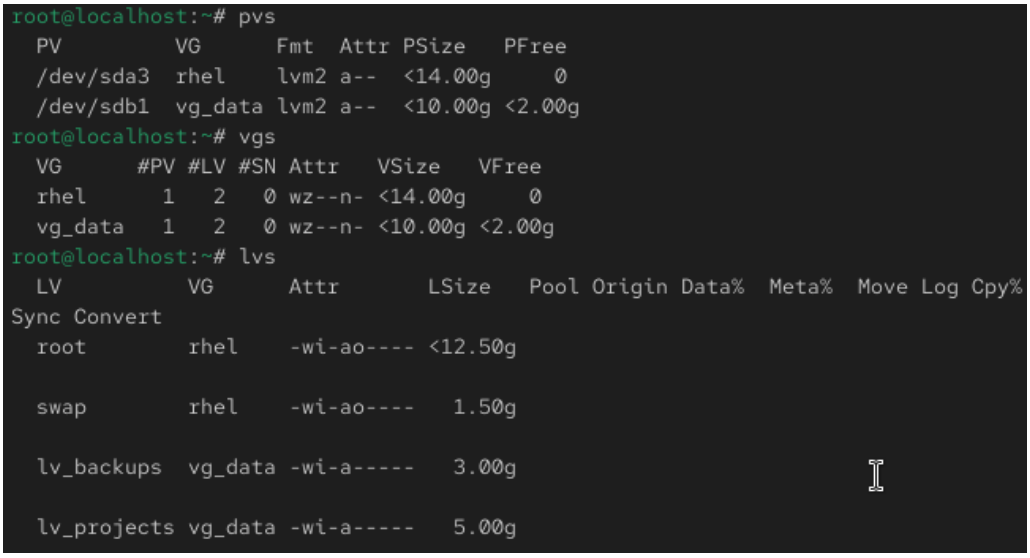

Figure 2: LVM physical volumes, volume groups, and logical volumes

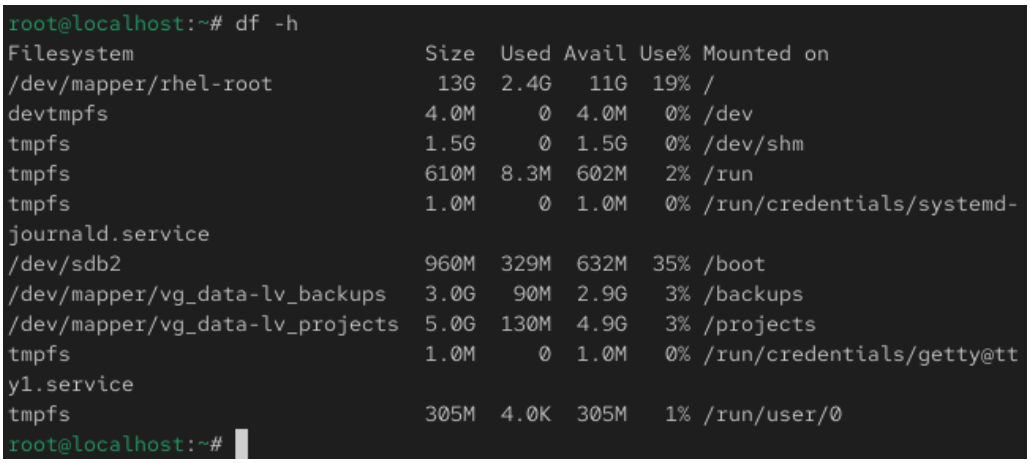

Figure 3: Mounted filesystems and disk usage

environments, including safe disk handling, flexible volume management, and reliable filesystem mounting.