

**Enterprise Linux High Availability Clustering**

**Course Number:** LNX-124  
**Duration:** 5 days

**Overview**

This Enterprise Linux High Availability Clustering training focuses on two key areas: Linux high availability (HA) clustering and HA storage administration. Attendees learn how to make use of clustered storage technologies to enable active/active configurations.

NOTE: This class can be taught using the Linux distribution of your choice.

**Prerequisites**

This course requires advanced knowledge of Linux system administration as taught in Accelebrate’s [Linux Fundamentals](file:////training/linux-fundamentals) and [Enterprise Linux Systems Administration](file:////training/enterprise-linux-system-administration).

**Materials**

All Linux training attendees receive comprehensive courseware.

**Software Needed on Each Student PC**

Attendees will not need to install any software on their computer for this class. The class will be conducted in a remote environment that Accelebrate will provide; students will only need a local computer with a web browser and a stable Internet connection. Any recent version of Microsoft Edge, Mozilla Firefox, or Google Chrome will be fine.

**Objectives**

* Assemble a realistic three-node Linux cluster utilizing best practices. Each node has three network interfaces and each student's cluster has its own dedicated cluster VLAN.
* Perform very real-world tasks in a real-world setting, including multipathing, redundant ring communication, last man standing cluster, and shared storage scenarios.
* Work with Cluster Architecture & Design, Pacemaker, Corosync, Fencing, Resource Management, Advanced Resource Management, Multipathing, Cluster LVM, and Global File System v2.

**Outline**

* Introduction to Clustering And Storage Management
  + Clustering Introduction
  + Cluster Building Blocks
  + Shared Storage
  + Hardware and Software Requirements
  + Network Considerations
  + Split Brain Prevention with Fencing
  + HA Components
  + Clustered Resources
  + Configuration Tools
  + Red Hat Cluster Stack Roadmap
  + Running Commands on Multiple Systems
* Corosync And Quorum Management
  + Vocabulary
  + Network Topology
  + Ethernet Bonding
  + Communication Methods
  + IPv6 Considerations
  + Cluster Node Preparation
  + Enable and Configure pcsd
  + PCS & PCSD
  + Cluster Quorum
  + Advanced Quorum Techniques
  + Corosync
  + Corosync - Redundant Ring Protocol (RRP)
  + Corosync Security
  + Joining and Leaving the Cluster
  + Quorum Administration
  + Upgrading
* STONITH and Fencing
  + Fencing Introduction
  + Node Level Fencing
  + Node Fencing: External
  + Node Fencing: Internal
  + Node Fencing: Pseudo
  + Resource Level Fencing
  + Fencing Architecture
  + STONITH Subsystem
  + Fencing Agents
  + Fencing Agents listing
  + STONITH Resources
  + Working With stonith\_admin
  + Manual Fencing
  + Best Practices
* Pacemaker Cluster Resource Manager
  + Cluster Architecture Revisited
  + Pacemaker Architecture
  + Pacemaker Cluster Information Base (CIB)
  + Resource Management Overview
  + Component Relationships
  + Resource Agents
  + Types of Resources
  + Resource Naming Conventions
  + Resource Specific Parameters/Options
  + Resource Meta Parameters/Options
  + Resource Agent Operations
  + Discover Resource Agents
  + Available Resource Agents
  + Resource Spotlight: IPAddr2
  + Add a Primative Resource
  + Resource Group Management
  + Resource Group Example
  + Resource Actions: Monitoring
  + Resource Administration
  + PCS vs. CRM\_\*
* Advanced Resource Configuration
  + Resource Placement Basics
  + Resource Ordering
  + Location Constraints
  + Relocating Resources
  + Relocation on Failure
  + Resource Standard: Clones & Multi-State
  + Resource Operations
  + Troubleshooting
  + Cluster Maintenance
* Storage Technologies
  + Remote Storage Overview
  + Remote Filesystem Protocols
  + Remote Block Device Protocols
  + Distributed Lock Manager
  + dlm\_controld & dlm\_tool
  + Block Devices and the Device Mapper
  + Managing Loopback Devices
  + ISCSI
  + iSCSI Architecture
  + iSCSI Target Implementations
  + iSCSI Target Node Preparation & targetcli
  + iSCSI Target Administration
  + iSCSI Target Defining Storage Objects
  + iSCSI Target LUN Administration
  + iSCSI Target Network Portal Configuration
  + iSCSI Target Security
  + iSCSI Target Examples
  + Open-iSCSI Initiator Implementation
  + iSCSI Initiator Discovery
  + iSCSI Initiator Node Administration
  + Mounting iSCSI Targets at Boot
  + iSCSI Multipathing Considerations
* Kernel Device Management
  + Managing Linux Device Files
  + Kernel Hardware Info â€“ /sys/
  + /sys/ Structure
  + udev
  + I/O Elevators
* Device Mapper and Multipathing
  + SAN Multipathing
  + Multipath Configuration
  + Multipathing Best Practices
* Advanced Lvm & Cluster Lvm
  + Logical Volume Management
  + Implementing LVM
  + Creating Logical Volumes
  + Activating LVM VGs
  + Exporting and Importing a VG
  + Examining LVM Components
  + Changing LVM Components
  + Advanced LVM Overview
  + Advanced LVM: Components & Object Tags
  + Advanced LVM: Automated Storage Tiering
  + Advanced LVM: Thin Provisioning
  + Advanced LVM: Striping & Mirroring
  + Advanced LVM: RAID Volumes
  + cLVM
* Global File System (GFS) 2
  + GFS2 Overview
  + GFS2 Capabilities
  + GFS2 Theory of Operation
  + GFS2 Configuration Prerequisites
  + Setting Up Cluster LVM
  + GFS2 Filesystem Creation & Mounting
  + GFS2 Filesystem Management
  + GFS2 Fencing Requirement
* Conclusion