

# HPE course number HK967S Course length 4 days Delivery mode ILT/vILT View schedule, local pricing, and register View now

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# Enterprise Linux High Availability Clustering HK967S

This is an in-depth course that focuses on two key areas, Linux high availability (HA) clustering and HA storage administration. Storage is integral to many HA clusters so as to make use of clustered storage technologies to enable active/active configurations.

Over the course of many in-depth lab exercises, each student will 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.

The class contains a storage array for shared LUNs among the nodes. This enables students to perform very real world tasks in a real world setting, including multipathing, redundant ring communication, last man standing cluster, and shared storage scenarios. Course topics include: Cluster Architecture & Design, Pacemaker, Corosync, Fencing, Resource Management, Advanced Resource Management, Multipathing, Cluster LVM, Global File System v2.

# **Prerequisites**

# **Supported Distributions**

This course requires an advanced knowledge of Linux system administration. These skills are taught in the <a href="H7091S"><u>H7091S</u></a> "Enterprise Linux Systems Administration" and <a href="U8583S"><u>U8583S</u></a> "Linux Fundamentals".

Red Hat Enterprise Linux 7

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# **Detailed Course Outline**

Module 1: Introduction to Clustering and Storage Management	Clustering Introduction	<ul> <li>Configuration Tools</li> </ul>
	Cluster Building Blocks	<ul> <li>Red Hat Cluster Stack Roadmap</li> </ul>
	Shared Storage	<ul> <li>Running Commands on Multiple Systems</li> </ul>
	Hardware and Software Requirements	<ul> <li>Lab Tasks</li> </ul>
	Network Considerations	<ul> <li>Running Commands on Multiple Hosts</li> </ul>
	Split Brain Prevention with Fencing	<ul> <li>Prepare System for Clustering</li> </ul>
	HA Components	<ul> <li>Static Network Configuration</li> </ul>
	Clustered Resources	
Module 2: Corosync and Quorum Management	<ul> <li>Vocabulary</li> </ul>	Corosync - Redundant Ring Protocol (RRP)
	<ul> <li>Network Topology</li> </ul>	Corosync Security
	Ethernet Bonding	<ul> <li>Joining and Leaving the Cluster</li> </ul>
	Communication Methods	Quorum Administration
	IPv6 Considerations	<ul> <li>Upgrading</li> </ul>
	Cluster Node Preparation	• Lab Tasks
	Enable and Configure pcsd	<ul> <li>Install and Configure PCSD</li> </ul>
	• PCS & PCSD	<ul> <li>Setup a Two Node Cluster</li> </ul>
	Cluster Quorum	<ul> <li>Setup a Three Node Cluster with PCS</li> </ul>
	Advanced Quorum Techniques	- Totem RRP
	• Corosync	- PCS GUI
Module 3: STONITH and Fencing	Fencing Introduction	Fencing Agents listing
	Node Level Fencing	Resource Spotlight: IPAddr2
	Node Fencing: External	STONITH Resources
	Node Fencing: Internal	Working With stonith_admin
	Node Fencing: Pseudo	Manual Fencing
	Resource Level Fencing	Best Practices
	Fencing Architecture	Lab Tasks
	STONITH Subsystem	<ul> <li>Suicide Fencing with Storage Based Death</li> </ul>
	Fencing Agents	<ul><li>Fencing with fence_scsi</li></ul>
Module 4: Pacemaker Cluster Resource Manager	Cluster Architecture Revisited	Discover Resource Agents
	Pacemaker Architecture	Available Resource Agents
	Pacemaker Cluster Information Base (CIB)	Add a Primative Resource
	Resource Management Overview	Resource Group Management
	Component Relationships	Resource Group Example
	Resource Agents	Resource Actions: Monitoring
	Types of Resources	Resource Administration
	Resource Naming Conventions	• PCS vs. CRM_*
	Resource Specific Parameters/Options	Lab Tasks
	Resource Meta Parameters/Options	<ul><li>Simple Management with PCS-GUI</li></ul>
	Resource Agent Operations	Using Resource Groups
Module 5: Advanced Resource Configuration	Resource Placement Basics	Troubleshooting
	Resource Ordering	Cluster Maintenance
	Location Constraints	Lab Tasks
	Relocating Resources	
	Relocating Resources     Relocation on Failure	- Setup a Web Farm
		Using Constraints     Cluster Monitoring
	Resource Standard: Clones & Multi-State	<ul> <li>Cluster Monitoring</li> </ul>
	Resource Operations	

### Course data sheet

Module 6: Storage Technologies	Remote Storage Overview	<ul> <li>Block Devices and the Device Mapper</li> </ul>
	Remote Filesystem Protocols	Managing Loopback Devices
	Remote Block Device Protocols	• Lab Tasks
	Distributed Lock Manager	<ul> <li>Manipulating Block Devices</li> </ul>
	• dlm_controld & dlm_tool	
Module 7: iSCSI	iSCSI Architecture	iSCSI Target Examples
	iSCSI Target Implementations	Open-iSCSI Initiator Implementation
	<ul> <li>iSCSI Target Node Preparation &amp; targetcli</li> </ul>	<ul> <li>iSCSI Initiator Discovery</li> </ul>
	iSCSI Target Administration	• iSCSI Initiator Node Administration
	iSCSI Target Defining Storage Objects	<ul> <li>Mounting iSCSI Targets at Boot</li> </ul>
	iSCSI Target LUN Administration	<ul> <li>iSCSI Multipathing Considerations</li> </ul>
	iSCSI Target Network Portal Configuration	Lab Tasks
	iSCSI Target Security	<ul> <li>iSCSI Initiator Configuration</li> </ul>
Module 8: Kernel Device Management	Managing Linux Device Files	• I/O Elevators
	<ul> <li>Kernel Hardware Info – /sys/</li> </ul>	• Lab Tasks
	<ul> <li>/sys/ Structure</li> </ul>	<ul> <li>Creating Custom UDEV Rules</li> </ul>
	• udev	
Module 9: Device Mapper and Multipathing	SAN Multipathing	• Lab Tasks
	Multipath Configuration	<ul> <li>Multipath Configuration</li> </ul>
	Multipathing Best Practices	
Module 10: Advanced LVM & Cluster LVM	Logical Volume Management	Advanced LVM: Automated Storage Tiering
	<ul> <li>Implementing LVM</li> </ul>	Advanced LVM: Thin Provisioning
	Creating Logical Volumes	Advanced LVM: Striping & Mirroring
	Activating LVM VGs	Advanced LVM: RAID Volumes
	Exporting and Importing a VG	• cLVM
	Examining LVM Components	Lab Tasks
	Changing LVM Components	<ul> <li>Creating and Managing LVM Volumes</li> </ul>
	Advanced LVM Overview	- cLVM
	Advanced LVM: Components & Object Tags	
Module 11: Global File System (GFS) 2	GFS2 Overview	GFS2 Filesystem Creation & Mounting
	GFS2 Capabilities	GFS2 Filesystem Management
	GFS2 Theory of Operation	GFS2 Fencing Requirement
	GFS2 Configuration Prerequisites	Lab Tasks
		- GFS2

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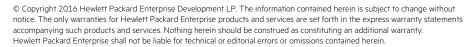
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