

RED HAT® ENTERPRISE LINUX®

DATASHEET

AVAILABILITY ADD-ONS High Availability

RED HAT ENTERPRISE LINUX HIGH AVAILABILITY ADD-ON

Decrease downtime and improve reliability with simple, cost-effective high availability for Red Hat Enterprise Linux



The Red Hat Enterprise Linux High Availability Add-On provides continuous availability by ensuring no single point of failure across your entire Red Hat Enterprise Linux environment. This includes both physical and virtual guest deployments. When using the High Availability Add-On, your service can fail over from one node to another with no apparent interruption to cluster clients. This drastically decreases downtime and reduces risks without the cost or complexity of traditional clustering solutions.

Maintain Data Integrity

The High Availability Add-On also ensures absolute data integrity when one cluster node takes control of a service from another cluster node. It achieves this – and prevents data corruption – by promptly evicting nodes from the cluster that are deemed to be faulty using a method called “fencing.” Clusters with up to 16 nodes on a single LAN are supported. Nodes can be either virtual machines or run on dedicated hardware.

Meeting Service Level Agreements

Management and administration of high availability clusters is important to ensure proper configuration and achieve trouble free operation. The High Availability Add-On includes configuration and management tools for setting up, configuring, and managing the cluster infrastructure and storage components so you can ensure that you are meeting your service-level agreements (SLAs).

Consider the High Availability Add-On if:

- You have mission critical applications running on high availability clusters, with either physical or virtual hosts
- You need high service availability and cannot tolerate service interruptions
- You wish to protect shared storage from data corruption in cluster node failure scenarios
- You need full cluster management and administration

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www.redhat.com/rhel/add-ons/

KEY FEATURES

Cluster Manager

In conjunction with Red Hat Enterprise Linux, Red Hat offers a portfolio of Add-Ons to extend the features of your Red Hat Enterprise Linux subscription. Add-Ons allow you to tailor your application environment to suit your particular computing requirements. With increased flexibility and choice, you can select the availability, scalability, and management features required by your organization when and where they are needed.

The High Availability Add-On uses a Cluster Manager feature (CMAN) to distribute cluster management across all nodes in the cluster. Cluster Manager keeps track of cluster quorum and stops cluster activity when half (or fewer) of the cluster nodes are active. This prevents the occurrence of a “split-brain” condition where two instances of the same cluster are running and accessing resources without knowledge of each other, thereby resulting in corrupted cluster integrity. For instance, each node in the cluster may mistakenly decide that every other node has gone down and attempt to start services that other nodes are still running. Having duplicate instances of services may cause data corruption on the shared storage.

Additionally, cluster manager administers cluster membership and monitors cluster activity to remove failed nodes and reroute as needed. Flexible configuration options allow users to prioritize important nodes in a cluster, providing flexible failure scenarios. Another asset utilized by the Cluster Manager is Red Hat’s Corosync. This cluster executive adds a layer to the High Availability Add-On. It uses the Totem Single Ring Ordering and Membership Protocol which gives the service a more mature security system and a high-performing, lightweight solution.

Integrated Virtualization

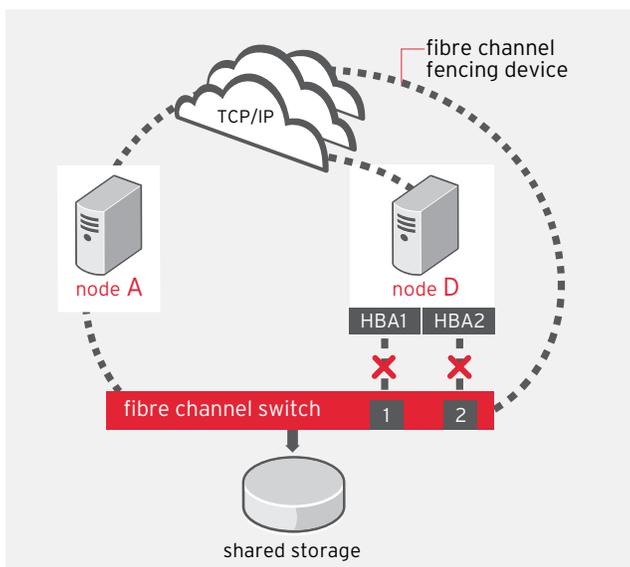
Red Hat Enterprise Linux is designed to be a virtualization list as well as a superior guest on any of the major hypervisors. Virtualization is integrated directly into the Red Hat Enterprise Linux kernel using kernel-based virtual machine (KVM) technology. As part of the kernel, administrators get the complete breadth of Red Hat Enterprise Linux system management, security tools and certifications.

Lock Management

Lock management is a cluster-infrastructure service that provides a mechanism for cluster infrastructure components to synchronize their access to shared resources. The High Availability Add-On uses Distributed Lock Manager (DLM), which runs on each cluster node and effectively distributes lock management across all nodes in a cluster. *Note: DLM is also used in the Resilient Storage Add-On with GFS2 locks.*

Figure 1

Fencing

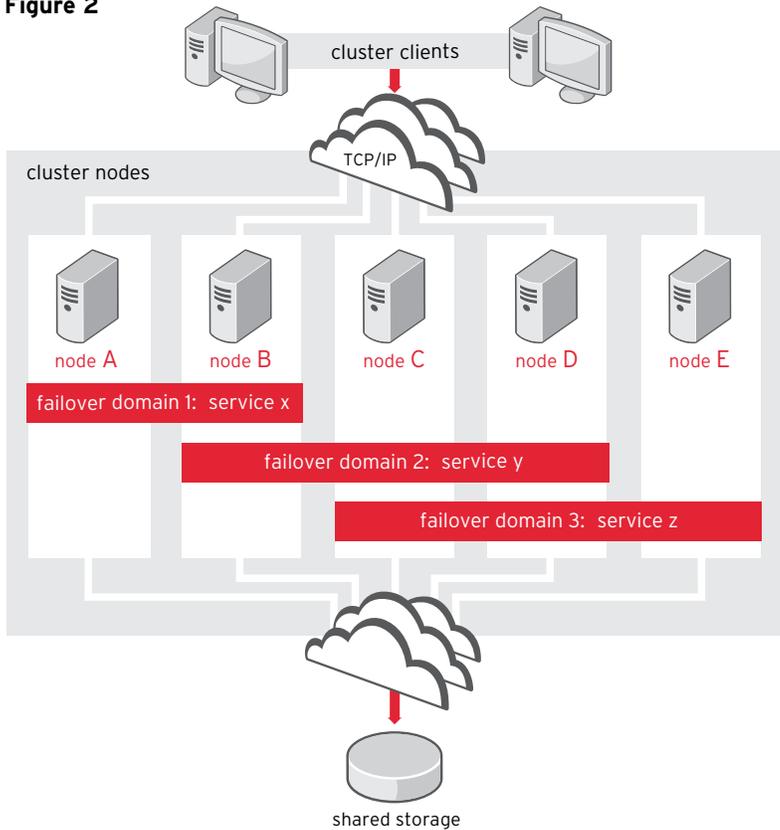


If Cluster Manager feature determines that a cluster node has failed, the failed node is automatically cut off from the cluster shared storage. The disconnection, or cut off, of a node from the cluster storage is called fencing. The High Availability Add-On includes a variety of fencing methods including power fencing (a method that cuts off power to an inoperable node), fibre channel switch fencing (a method that disables the fibre channel port that connects storage to the inoperable node), and several other fencing methods that disable the I/O or power of an inoperable node. (See Figure 1.)

A node can be configured with one fencing method or multiple fencing methods. When multiple fencing methods are selected, the fencing methods are cascaded in a configurable order until a fencing method is successful.

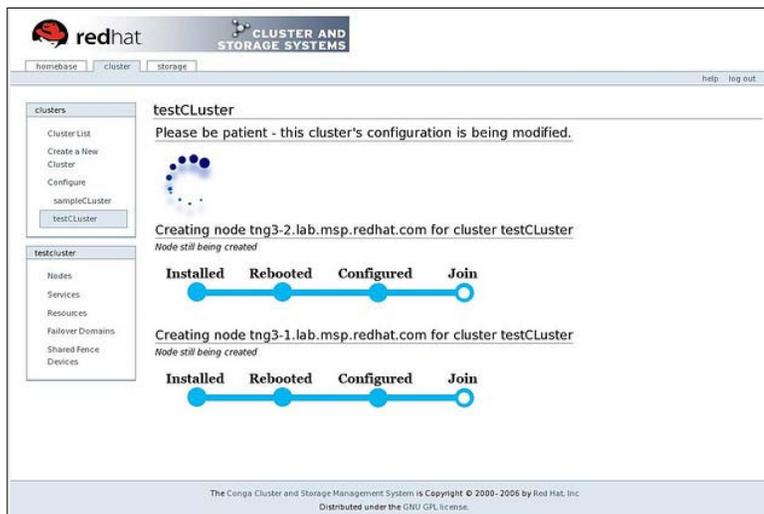
Fibre Channel Switch Fencing – examples of fencing methods available within the High Availability Add-On solution

Figure 2



The High Availability Add-On provides a complete solution for failover scenarios.

Figure 3



Cluster Node Status from Conga – the Conga administration application provides a single

High Availability Service Management

An application may be configured along with other cluster resources to form a high-availability cluster service. A high availability cluster service can fail over from one cluster node to another with no apparent interruption to cluster clients. Failover can occur if a cluster node fails, or if a cluster system administrator moves the service from one cluster node to another, as would occur for a planned outage. (See Figure 2.)

Command-Line Cluster Configuration System (CCS)

This feature was introduced with Red Hat Enterprise Linux 6.1 and is available to all succeeding releases as well. CCS allows users to create a cluster configuration file on a cluster node. This enables the user to work on a file from a local machine, where you can maintain it under version control. Using the CCS command does not require root privilege.

Conga for Cluster Administration

The High Availability Add-On includes a Conga administration tool. Conga consists of an agent (“ricci”) installed on each node in the cluster, and an application server (“luci”) that serves as a central point for managing clusters. Luci connects to the ricci agent and maintains a database of node and user information. Users access luci through a web interface, which makes it easy to access the user-friendly Conga configuration window. Administrators use luci to add clusters, storage systems, and users as well as perform other administrative tasks. (See Figure 3.)

The High Availability Add-On can also be configured and managed through a set of command-line tools for administrators who prefer command line management for its simplicity and scripting capabilities.

COMPATIBILITY OF SERVERS AND RED HAT ENTERPRISE LINUX VERSIONS

The High Availability Add-On is fully compatible with other Red Hat Enterprise Linux Add-Ons, including the Load Balancer Add-On (load balancing applications across redundant servers) and the Resilient Storage Add-On (providing the GFS2 Global File System 2). Red Hat reserves the right to exclude additional packages for security reasons.

FEATURE SUMMARIES

Cluster Manager (CMAN)	The CMAN feature is exactly like it sounds, it manages the cluster quorum. It is meant as a largely preventative measure to avoid deficiencies like "split-brain" and data corruption. CMAN is responsible for the unique flexibility offered to the cluster
Corosync	Corosync is a cluster executive within the High Availability Add-On that implements the Totem Single Ring Ordering and Membership Protocol, delivering an extremely mature, secure, high-performing, and lightweight high-availability solution.
Integrated Virtualization	This feature allows the High Availability Add-On to work directly with the Red Hat Enterprise Linux kernel using kernel-based virtual machine (KVM) technology.
Fencing and Unfencing	<p>Fencing is the process of removing access to resources from a cluster node that has lost contact with the cluster, thereby protecting resources such as shared storage from uncoordinated modification.</p> <p>Red Hat has made extensive improvements in the SCSI-3 PR reservations-based fencing. By enabling manual specification of keys and devices for registration and reservation, cluster administrators can bypass clvm and improve configuration and system flexibility.</p> <p>After fencing, the unconnected cluster node would ordinarily need to be rebooted to safely rejoin the cluster. However, unfencing allows a node to re-enable access when starting up without administrative intervention.</p>
Command-Line Cluster Configuration System	This very recent addition to the High Availability Add-On allows users to work on files from a local machine after creating a cluster configuration file on a cluster node.
Conga	The Conga application, a GUI interface, provides centralized configuration and management for the High Availability Add-On.

SERVER AND VERSION COMPATIBILITY

Red Hat Enterprise Linux Version	Variants	Releases
Red Hat Enterprise Linux 5	Red Hat Enterprise Linux Server Red Hat Enterprise Linux AP	Red Hat Enterprise Linux 5.5 and later
Red Hat Enterprise Linux 6	Red Hat Enterprise Linux for SAP Business Apps	Red Hat Enterprise Linux 6.0 and later

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EXECUTIVE SUMMARY

Red Hat's High Availability Add-On enables your most critical applications to be highly available by reducing downtime and ensuring that there is no single point of failure in a cluster. The High Availability Add-On also isolates unresponsive applications and nodes so they can't corrupt critical enterprise data. You can read about our additional Add-On offerings by visiting <http://www.redhat.com/rhel/add-ons/>.

HOW TO ORDER THE HIGH AVAILABILITY ADD-ON

The Red Hat Enterprise Linux High Availability Add-On is delivered through Red Hat Network, similar to the way regular Red Hat Enterprise Linux content is provided. Customers using the RHN Satellite can make use of Satellite to manage Load-Balancer systems.

To order Red Hat Enterprise Linux High Availability Add-On, please contact your local Red Hat Account Representative.

ABOUT RED HAT

Red Hat, the world's leading provider of open source solutions and an S&P 500 company, is headquartered in Raleigh, NC with more than 70 offices spanning the globe. Red Hat provides high-quality, affordable technology with its operating system platform, Red Hat Enterprise Linux, together with cloud, virtualization, management, storage and service-oriented architecture (SOA) solutions, including Red Hat Enterprise Virtualization and JBoss Enterprise Middleware. Red Hat also offers support, training and consulting services to its customers worldwide.

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**EUROPE, MIDDLE EAST
AND AFRICA**
00800 7334 2835
www.europe.redhat.com
europe@redhat.com

ASIA PACIFIC
+65 6490 4200
www.apac.redhat.com
apac@redhat.com

LATIN AMERICA
+54 11 4329 7300
www.latam.redhat.com
info-latam@redhat.com