



RED HAT ENTERPRISE VIRTUALIZATION: LIVE MIGRATION

WHAT IS LIVE MIGRATION?

Red Hat Enterprise Virtualization includes *Live Migration*, which provides the ability to move a running virtual machine between physical hosts with no interruption to service.

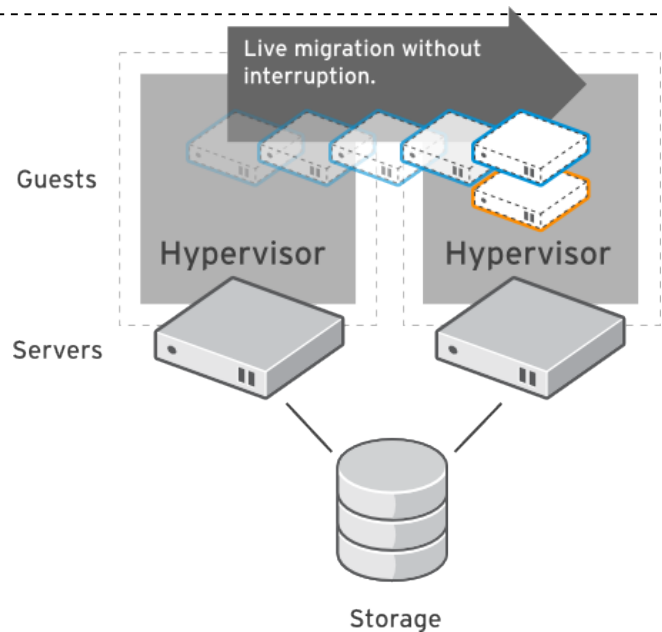
Live Migration is transparent to the end user: the virtual machine remains powered on and user applications continue to run while the virtual machine is relocated to a new physical host.

Red Hat Enterprise Virtualization (RHEV) allows the administrator to:

- Perform hardware maintenance without application downtime.
- Relocate a virtual machine to a new host to dynamically balance resources within a cluster.
- Migrate a virtual machine from a host that may be experiencing a soft-failure
- Move a virtual machine to a new host to free up resources to allocate to other virtual machines.

IMPROVE SERVICE LEVELS

Using *Live Migration*, administrators can reduce planned downtime and improve their operational efficiency. Rather than schedule maintenance for overnight or weekends, administrators can use Live Migration to move virtual machines from their physical host systems to perform hardware or software maintenance during regular business hours, all without interruption to your critical business applications.



REDUCE COSTS

Live Migration allows business to reduce their costs in two key areas

- *Eliminate the cost of business downtime*
Using *Live Migration*, hardware maintenance can be performed without impacting critical business applications. Live Migrate the virtual machines running your critical business applications to another physical server without a single second of downtime.
- *Reduce administration and maintenance costs*
by minimizing the need for expensive out-of-hours maintenance windows. Perform server maintenance during regular working hours instead of paying over-time for late night or weekend operations – all without an interruption to service.



MANAGEMENT

Live Migration is managed by Red Hat Enterprise Virtualization Manager. Using a web based user interface the administrator can define a cluster of physical host systems on which a virtual machine can run. Red Hat Enterprise Virtualization Manager ensures that each physical hosts (hypervisor) can access all the resources required to run the virtual machine. The following resources are monitored to ensure successful migration :

- *Storage*
Ensures that each hypervisor in the cluster has access to the storage used by the virtual machines either on an NFS filer, Fiber Channel or iSCSI storage array.
- *Network*
Verifies that the hypervisor has access to the virtual networks or vLANs used by the virtual machine.
- *CPU Utilization*
Ensures that migrating the virtual machine to the hypervisor would not exceed the maximum CPU utilization threshold defined for the cluster.
- *Memory*
Ensures that enough memory is available on the hypervisor for the virtual machine.
- *CPU Compatibility*
Ensures that each hypervisor in the cluster has compatible CPUs for live migration.

Red Hat Enterprise Virtualization Manager can automatically select to which hypervisor the virtual machine should be migrated based on defined system policies and available resources. The administrator can override the automatic selection to select a specific hypervisor.

RESROUCE MANAGEMENT

Live Migration maybe manually initiated by an administrator through the web interface, through the command line or via an API. In each case the event is audited and recorded in the system log.

Red Hat Enterprise Virtualization Manager can automatically live migrate virtual machines based on policies defined within the *System Scheduler* or *Power Saver* modules, allowing an administrator to define rules for automatically balancing workload throughout the data center.

CPU COMPATIBILITY

Red Hat Enterprise Virtualization Manager allows the administrator to define a baseline for CPUs within a cluster to ensure that virtual machines may be safely live migrated to any hypervisor in the cluster.

This feature allows an administrator to select the CPU family and features to be supported by the cluster. Red Hat Enterprise Virtualization Manager will automatically mask any extra CPU features not supported by the baseline configuration and a host that does not support this baseline configuration will not be permitted to join the cluster. The baseline configuration for the cluster may be changed to take advantage of new hardware features.

NETWORKING

Red Hat Enterprise Virtualization Manager supports multiple virtual networks and vLANs allowing an administrator to centrally manage and configure the virtual network. During live migration, the virtual MAC addresses for the network interfaces assigned to the virtual machine are maintained, allowing network connections to remain active during and after the migration.

HARDWARE REQUIREMENTS

Shared storage is required for *Live Migration*. Red Hat Enterprise Virtualization supports both NAS, using NFS and SAN storage models through Fiber Channel or iSCSI including support for multipath I/O for improved storage performance and reliability.

SOFTWARE REQUIREMENTS

Live Migration is included within all editions of Red Hat Enterprise Virtualization.

Live Migration is supported for all guest operating systems.