



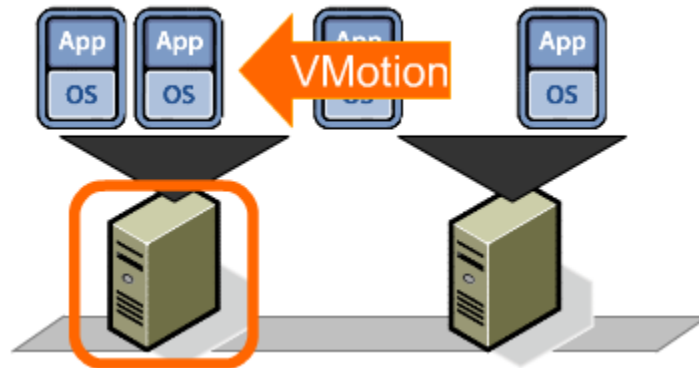
Sri Lanka Institute of Information Technology

V-Motion

ESBII

What is V-Motion

V-Motion allows move virtual servers and desktops from one physical server to another without having to shut down the virtual desktop or server. All of this is done in real time without the user of the virtual machine even knowing they have been moved. V-Motion is the first step among many VMware software solutions that are incorporated to make sure that downtime is kept to a minimum, which include Fault Tolerance, High Availability, and Digital Resource Scheduler.



Requirements

- CPU compatibility
- V-Motion interface (minimum 1 Gb adapter)
- shared central mass storage
- same naming for virtual port groups
- sufficient resources on the target host
- at least one vSphere Essentials Plus license on the corresponding ESX host

vmotion compatibility

V Motion has quite a few requirements that need to be in place before it will work correctly. Here is a list of the key requirements for V Motion to work.

- Each host must be correctly licensed
- Each host must meet shared storage requirements
- Each host must meet the networking requirements
- Each compatible CPU must be from the same family

When configuring vMotion between hosts I would recommend keeping to one brand of server per cluster, i.e. Dell, HP, IBM. Also always ensure that these servers are compatible with each other. You can confirm this by speaking to the server manufacturer.

A very important item to consider is to always ensure you are using the latest BIOS version on each of your hosts. Ensuring that the CPU's are compatible with each other is essential for vMotion to work successfully, this is because the host that the virtual machine migrates to has to be capable of carrying on any instructions that the first host was running.

If a virtual machine is successfully running an application on one host and you migrate it to another host without these capabilities the application would most likely crash, possibly even the whole server would crash, hence why vMotion compatibility is required between hosts before you can migrate a running virtual machine.

It is user-level instructions that bypass the virtualisation layer such as Streaming SIMD Extensions (SSE), SSE2 SSSE3, SSE4.1 and Advanced Encryption Standard (AES) Instruction Sets that can differ greatly between CPU models and families of processors, and so can cause application instability after the migration

Advantages of V-Motion

- Automatically optimize and allocate entire pools of resources

By having all server and/or desktops virtualized we can move VM's from one physical host to another, which is done rapidly over a high speed network connection, the original host and destination host stay in sync until the transfer is complete leaving the user unaware of the move. This allows network administrators to easily select resource pools to assign to the different VMs.

- Move VM's from failing or underperforming priorities

If there looks like a server is about to fail or is reaching its capacity, administrators can manually move VMs to another physical host, this allows us data center to be more dynamic in nature. Instead of having to upgrade hardware, we can move VM to another host to allow each VM to be more flexible in nature. If 2 VM's are putting a physical host to capacity then we could move one to another server that isn't being used as much.

- Minimizes scheduled Downtime

90% of downtime is scheduled, before V-Motion administrators had to do server maintenance late at night in order to avoid disrupting users. Having all the servers as virtual machines, we only have to move the VM to another physical host, creating zero downtime for the users and allowing administrators to perform maintenance at any time. With DRS (Digital Resource Manager), all we have to do is put a server in maintenance mode and V-Motion will automatically move all VM's to another server.

Pros of V-Motion

- Dynamic allocation services of the software allow you to allocate resources and memory while the processes are running.
- Security service of the software is flexible and allows you to implement user defined policy enforcement.
- The software supports all major operating systems as well as wide range of hardware.

- V-Motion allows to precisely identify the optimal placement for virtual machine.
- Virtual machines can be optimized within resource pools automatically.

Cons of V-Motion

- There is no module for performance management on the software.
- Unlike its competitors, the software does not offer any reporting capabilities.
- Configuration features of the software do not include auto recovery, configuration history, and NIC teaming capabilities.
- There are no performance management features of adaptive analysis, memory compression, and continuous resource allocation on the software.

How Does V-Motion Work?

First, the entire state of a virtual machine is encapsulated by a set of files stored on shared storage. VMware's clustered Virtual Machine File System (VMFS) allows multiple installations of ESX Server to access the same virtual machine files concurrently.

Second, the active memory and precise execution state of the virtual machine is rapidly transferred over a high speed network. This allows the virtual machine to instantaneously switch from running on the source ESX Server to the destination ESX Server. V-Motion keeps the transfer period imperceptible to users by keeping track of on-going memory transactions in a bitmap. Once the entire memory and system state has been copied over to the target ESX Server, V-Motion suspends the source virtual machine, copies the bitmap to the target ESX Server, and resumes the virtual machine on the target ESX Server. This entire process takes less than two seconds on a Gigabit Ethernet network.

Third, the networks used by the virtual machine are also virtualized by the underlying ESX Server. This ensures that even after the migration, the virtual machine network identity and

network connections are preserved. V-Motion manages the virtual MAC address as part of the process. Once the destination machine is activated, V-Motion pings the network router to ensure that it is aware of the new physical location of the virtual MAC address. Since the migration of a virtual machine with V-Motion preserves the precise execution state, the network identity, and the active network connections, the result is zero downtime and no disruption to users.