Enterprise Standards and Best Practices for IT Infrastructure (ESBII)

Assignment: V-Motion

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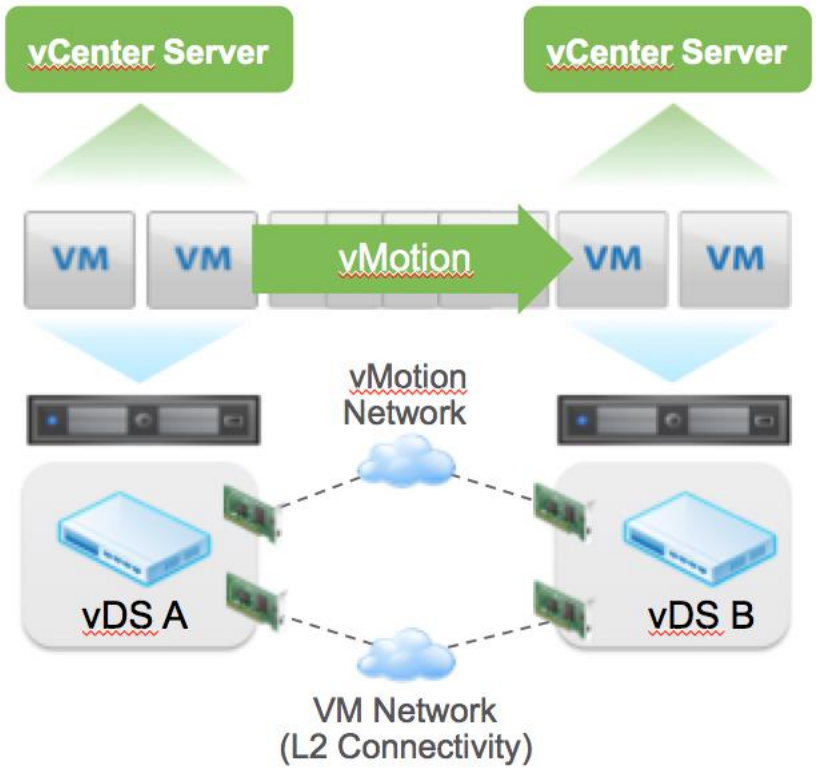
V-Motion

The vmotion is a feature that let administrator to manually migrate vm from host to another for maintainace or any other reason or can be auomatically migrated using DRS feature , in both situations there is zero down-time at moment of migration. VMware V-Motion enables the live migration of running virtual machines from one physical server to another with zero downtime, continuous service availability, and complete transaction integrity. It is transparent to users.V-Motion automatically optimize and allocate entire pools of resources for maximum hardware utilization and availability, Perform hardware maintenance without any scheduled downtime, Proactively migrate virtual machines away from failing or underperforming servers.

How does it work?

The entire state of a virtual machine is encapsulated by a set of files stored on shared storage and the clustered Virtual Machine File System allows multiple installations of the ESX Server to access the same virtual files concurrently. Also, the 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. Afterwards, 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.


vCenter Server
vCenter Server
VM
VM
vMotion
VM
VM
vMotion
Network
vDS A
vDS B
VM Network
(L2 Connectivity)

Requirements to Configure V-Motion

Certain conditions must be fulfilled so that the server migration process can run without problems or failures as V-Motion is arbitrated in an active virtual machine. The requirements are as follows:

1. CPU Compatibility:

    - Host CPU family and model
    - Settings in the BIOS that might disable CPU features
    - ESX version running on the host
    - The virtual machine's compatibility setting
    - The virtual machine's guest operating system

2. V-Motion Interface – Minimum 1GB adapter
3. Shared central mass storage
4. Same naming for virtual port groups
5. Sufficient resources on the target host
6. At least one vSphere essentials plus license on the corresponding ESX host.
7. The requirements for Long Distance vMotion are the same as Cross vCenter vMotion, except with the addition of the maximum latency between the source and destination sites must be 100 ms or less, and there is 250 Mbps of available bandwidth.
8. To stress the point: The VM network will need to be a stretched L2 because the IP of the guest OS will not change. If the destination portgroup is not in the same L2 domain as the source, you will lose network connectivity to the guest OS. This means in some topologies, such as metro or cross-continental, you will need a stretched L2 technology in place. The stretched L2 technologies are not specified. Any technology that can present the L2 network to the vSphere hosts will work, as it’s unbeknown to ESX how the physical network is configured. Some examples of technologies that would work are VXLAN, NSX L2 Gateway Services, or GIF/GRE tunnels.
9. There is no defined maximum distance that will be supported as long as the network meets these requirements. Your mileage may vary, but are eventually constrained by the laws of physics.
10. The vMotion network can now be configured to operate over an L3 connection.
11. Configure each host with at least one network interface for vMotion traffic. To ensure secure data transfer, the vMotion network must be a secure network, accessible only to trusted parties. Additional bandwidth significantly improves vMotion performance. Consider that when you migrate a virtual machine with vMotion without using shared storage, the contents of the virtual disk is transferred over the network as well.