Live Migration

Improved Live Migration

Windows Server 2012 R2 takes full advantage of your hardware to reduce the time required to live migrate virtual machines. It is now faster and easier to manage and maintain and your private cloud infrastructure. When maintenance or upgrades are required on your server running Hyper-V, live migration enables you to quickly migrate your virtual machines. This reduces the time it takes to monitor lengthy migration operations.You can also quickly and efficiently balance your virtual machine workloads.
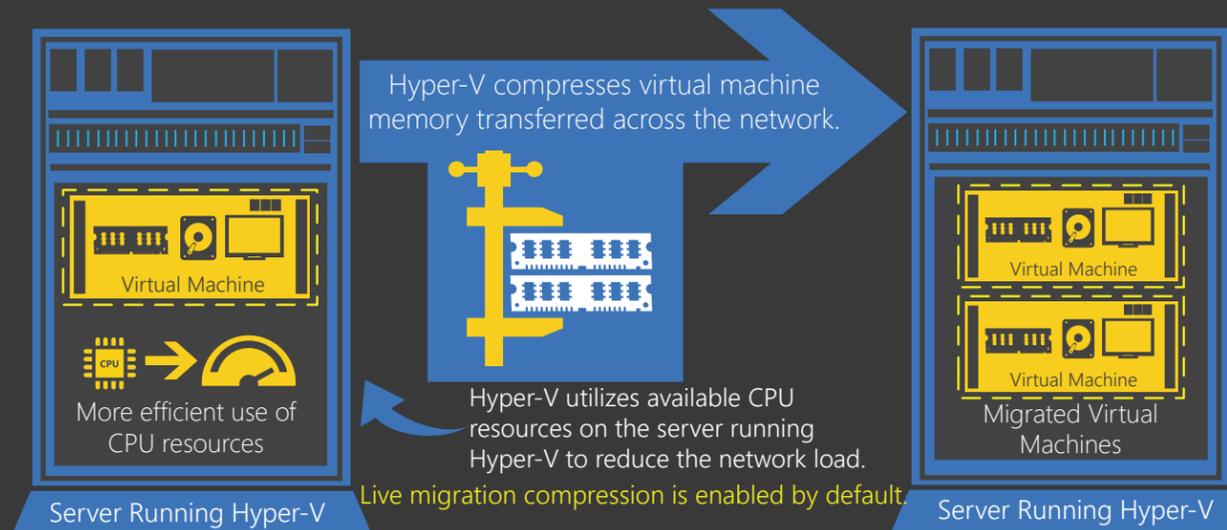
In Windows Server 2012 R2, live migration provides three options to reduce the time required to live migrate your virtual machines. You can choose to use memory compression. Alternatively, you can choose to use Remote Direct Memory Access (RDMA) functionality (which requires RDMA-enabled adapters) or multichannel network adapters.

These live migration options can support your private cloud infrastructure by:

- Increasing the efficiency of live migration when your hardware resources are constrained (memory compression).

- Increasing the scalability of live migration when your hardware resources are not constrained (multi-channel and RDMA-enabled network adapters).

Faster Live Migration (less than 10 GB)

In environments where hardware and networking resources are constrained, live migration delivers performance improvements for migrating virtual machines by compressing the memory data before sending it across the network. This utilizes spare CPU capacity available in the server running Hyper-V. Hyper-V closely monitors the CPU requirements of the virtual machine and only consumes an appropriate amount of CPU resources to quickly move virtual machines from one server to the next.

Hyper-V compresses virtual machine memory transferred across the network.

Hyper-V utilizes available CPU resources on the server running Hyper-V to reduce the network load.

Live migration compression is enabled by default.

More efficient use of CPU resources

Virtual Machine

Server Running Hyper-V

Migrated Virtual Machines

Virtual Machine
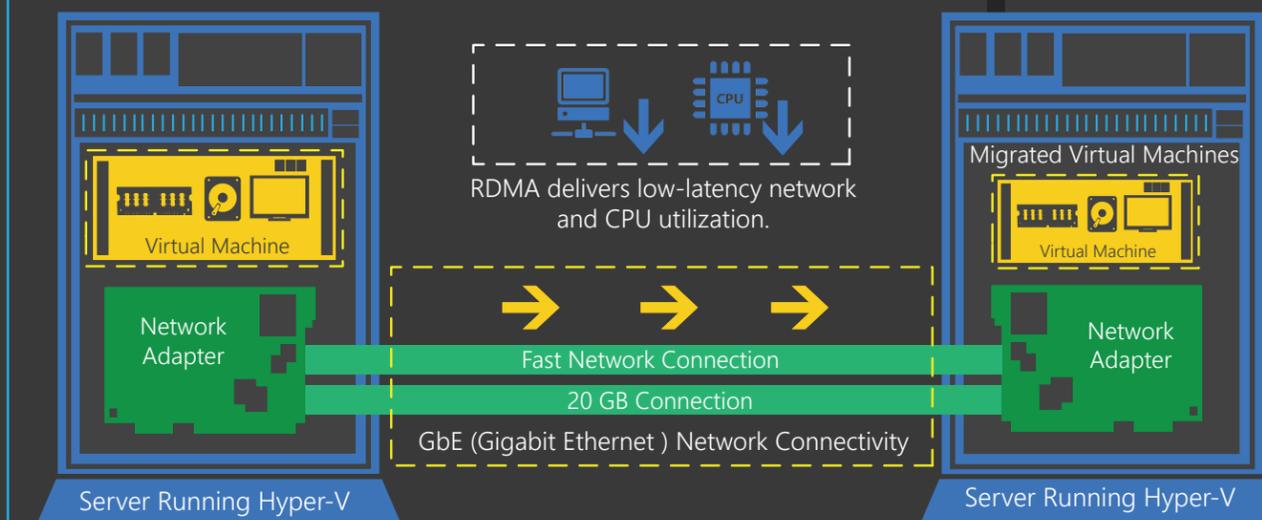
Virtual Machine

Server Running Hyper-V

Faster Live Migration (greater than 10 GB)

In environments where networking resources are not constrained, you can configure live migration to use multi-channel network adapters or RDMA-enabled network adapters, which reduces the time required to live migrate virtual machines.
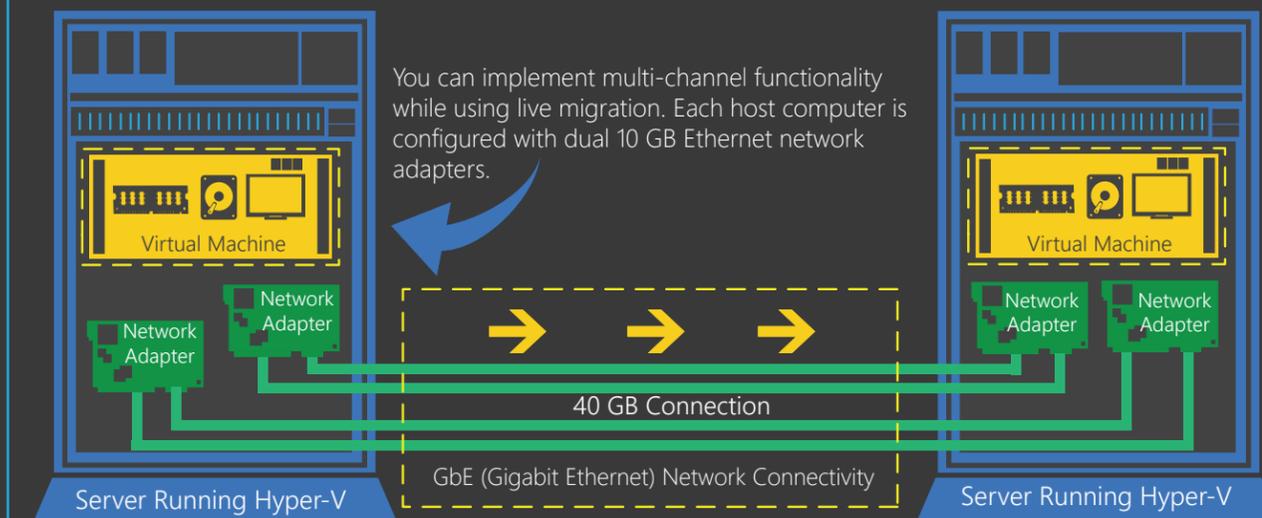
Live Migration with RDMA-enabled Network Adapters

Computers that are running Windows Server 2012 R2 are equipped with RDMA-enabled network adapters that deliver significantly faster live migrations for your virtual machines. RDMA is able to perform a direct memory access from the memory of one computer into that of another without involving the operating system. This permits high-throughput, low-latency networking and delivers greater effeciency with live migration.

RDMA delivers low-latency network and CPU utilization.

Migrated Virtual Machines

Virtual Machine

Virtual Machine

Network Adapter

Fast Network Connection

20 GB Connection

GbE (Gigabit Ethernet) Network Connectivity

Network Adapter

Server Running Hyper-V

Server Running Hyper-V

Live Migration with Multi-Channel Network Adapters

Windows Server 2012 R2 servers running multi-channel network adapters installed can perform faster live migrations for your virtual machines. Large virtual machines can be migrated simultaneously, utilizing multiple network adapters and hence achieving faster migration efficiencies.

You can implement multi-channel functionality while using live migration. Each host computer is configured with dual 10 GB Ethernet network adapters.

Virtual Machine

Network Adapter

Network Adapter

40 GB Connection

GbE (Gigabit Ethernet) Network Connectivity

Server Running Hyper-V

Virtual Machine

Network Adapter

Network Adapter

Server Running Hyper-V

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- Live Migration
- Hyper-V Storage Virtual Hard Disk Sharing
- Online Virtual Hard Disk Resizing Quality of Service
- Session Modes
- Hyper-V and Failover Clustering
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