

Generation 2 Virtual Machines

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Windows Server 2012 R2 introduces a new class of virtual machines that are optimized for virtualization—generation 2 virtual machines. They provide advanced features that deliver significant management, storage and security benefits.

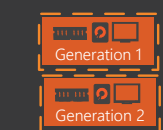
In Windows Server 2012 R2, generation 2 virtual machine hardware removes most of the emulated (“legacy”) devices, or replaces them with optimized software-based devices.

Generation 2 virtual machines lay the foundation for advanced virtual machine features, including a reduced attack surface for the platform and faster boot times for virtual machines.

Booting Generation 2 Virtual Machines

Generation 2 virtual machines use a Unified Extensible Firmware Interface (UEFI) and software-based devices when turning on your computer. UEFI is an alternate firmware interface and delivers improved boot time performance and flexibility.

Generation 2 virtual machines provide the following boot capabilities.



Running simultaneous virtual machines on the same server.

Windows Server 2012 R2 supports creating and running generation 1 and generation 2 virtual machines on the same server simultaneously. This ensures you can easily migrate virtual machines running on an earlier version of Hyper-V to Windows Server 2012 R2.



Network boot. Generation 2 virtual machines use the optimized virtual network adapter. This eliminates the need for an emulated network adapter. It simplifies the process of booting a virtual machine and decreases problems associated with configuring virtual machine network adapters. IPV4 and IPV6 addressing schemes are supported.



Secure Boot. Generation 2 virtual machines use UEFI firmware, which provides support for Secure Boot. Secure Boot functionality prevents “unauthorized” operating systems and software from loading during the startup process.



Boot from a SCSI CD/DVD. Generation 2 virtual machines can boot from a SCSI CD/DVD drive using an ISO image file.



Boot from a SCSI-attached virtual hard disk. Using UEFI firmware support, generation 2 virtual machines can boot from SCSI-attached virtual hard disks (VHDX). The VHDX file format supports volumes up to 64 TB.

Understanding Generation 2 Virtual Machines

Generation 2 Virtual Machine

Generation 2 virtual machines in Windows Server 2012 R2 support the same Hyper-V features as generation 1 virtual machines in Windows Server 2012. These include checkpoints (snapshots), state transitions (for example Saved or Paused), import/export, backup/restore, failover replication, clustering and advanced networking features such as Quality of Service(QoS), Single-Root I/O Virtualization (SR-IOV) and virtual machine queuing. Generation 2 virtual machines do not support RemoteFX.

- Generation 2 virtual machines use UEFI firmware instead of the BIOS.
- Generation 2 virtual machines can use software-based Fibre Channel and network adapters.
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- Generation 2 virtual machines use software-based devices for video. They support the same video modes as generation 1 virtual machines.
- Generation 2 virtual machines support the VHDX file format and support large boot volumes up to 64 TB. You can also use online resizing to expand or shrink your virtual hard disk files (VHDX). This includes the operating system (boot drive) and data volumes. Online resizing is only available for SCSI-attached VHDX files.
- Generation 2 virtual machines support 64-bit versions of Windows 8 or Windows Server 2012 and Windows Server 2012 R2.
- CD/DVD devices can be hot-added and hot-removed from a generation 2 virtual machine. No CD/DVD devices are present by default.
- Generation 2 virtual machines support ISO format images.
- Generation 2 virtual machines are available for integration services setup.
- You can manage generation 2 virtual machine boot order using Windows PowerShell, Hyper-V Manager, or Windows Management Interface (WMI).
- Secure Boot is not available in generation 1 virtual machines. Generation 1 virtual machines use the BIOS and emulated IDE before software-based devices can be utilized.

More information ...

- Live Migration
- Hyper-V Storage Virtual Hard Disk Sharing
- Online Virtual Hard Disk Resizing Quality of Service
- Session Modes
- Hyper-V and Failover Clustering
- Generation 2 Virtual Machines
- Windows 8 App Server Posterpedia