Configure Virtual Machine Settings

Greg Shields
AUTHOR EVANGELIST

@concentratdgreg www.pluralsight.com

What This Module Covers

Create and configure Generation 1 and 2 VMs and determine appropriate usage scenarios

Manage Integration Services

Add or remove memory in a running VM

Configure dynamic memory

Configure smart paging

Configure NUMA support

Configure Resource Metering

Implement enhanced session mode

What This Module Covers[2]

- Move and convert VMs from previous versions of Hyper-V to Windows Server 2016 Hyper-V
- Export and import VMs
- Implement Discrete Device Assignment
- Create Linux and FreeBSD VMs
- Install and configure Linux Integration Services
- Install and configure FreeBSD Integration Services
- Implement Secure Boot for Windows and Linux environments

Determine Usage Scenarios for Gen1/Gen2 VMs

Generally, use Generation 2 VMs, except...

VHD is not UEFI-compatible

You plan to move your VM to Azure*

Your OS is not supported on Generation 2

Your boot method is not supported on Generation 2

Generation 2 Guest OS Support

Windows Server 2016	Windows Server 2012 R2	Windows Server 2012
Windows 10 x64	Windows 8.1 x64	Windows 8 x64

OS Version	Gen 1	Gen 2
RHEL/CentOS 7.x series	✓	✓
RHEL/CentOS 6.x series	✓	✗
RHEL/CentOS 5.x series	✓	✗
Debian 7.x series	✓	✗
Debian 8.x series	✓	✓
FreeBSD 10 and 10.1	✓	✗
FreeBSD 9.1 and 9.3	✓	✗
FreeBSD 8.4	✓	✗
Oracle Linux 7.x series	✓	✓
Oracle Linux 6.x series	✓	✗
Oracle Linux UEK R3 QU3	✓	✗
Oracle Linux UEK R3 QU2	✓	✗
Oracle Linux UEK R3 QU1	✓	✗
SUSE Linux Enterprise Server 12 series	✓	✓
SUSE Linux Enterprise Server 11 series	✓	✗
Open SUSE 12.3	✓	✗
Ubuntu 14.04 and later versions	✓	✓
Ubuntu 12.04	✓	✗

OS Version	Gen 1	Gen 2
RHEL/CentOS 7.x series	✓	✓
RHEL/CentOS 6.x series	✓	✗
RHEL/CentOS 5.x series	✓	✗
Debian 7.x series	✓	✗
Debian 8.x series	✓	✓
FreeBSD 10 and 10.1	✓	✗
FreeBSD 9.1 and 9.3	✓	✗
FreeBSD 8.4	✓	✗
Oracle Linux 7.x series	✓	✓
Oracle Linux 6.x series	✓	✗
Oracle Linux UEK R3 QU3	✓	✗
Oracle Linux UEK R3 QU2	✓	✗
Oracle Linux UEK R3 QU1	✓	✗
SUSE Linux Enterprise Server 12 series	✓	✓
SUSE Linux Enterprise Server 11 series	✓	✗
Open SUSE 12.3	✓	✗
Ubuntu 14.04 and later versions	✓	✓
Ubuntu 12.04	✓	✗

OS Version	Gen 1	Gen 2
RHEL/CentOS 7.x series	✓	✓
RHEL/CentOS 6.x series	✓	✗
RHEL/CentOS 5.x series	✓	✗
Debian 7.x series	✓	✗
Debian 8.x series	✓	✓
FreeBSD 10 and 10.1	✓	✗
FreeBSD 9.1 and 9.3	✓	✗
FreeBSD 8.4	✓	✗
Oracle Linux 7.x series	✓	✓
Oracle Linux 6.x series	✓	✗
Oracle Linux UEK R3 QU3	✓	✗
Oracle Linux UEK R3 QU2	✓	✗
Oracle Linux UEK R3 QU1	✓	✗
SUSE Linux Enterprise Server 12 series	✓	✓
SUSE Linux Enterprise Server 11 series	✓	✗
Open SUSE 12.3	✓	✗
Ubuntu 14.04 and later versions	✓	✓
Ubuntu 12.04	✓	✗

Generation 2 Boot Methods

Boot method	Gen 1	Gen 2
PXE boot by using a standard network adapter	✗	✓
PXE boot by using a legacy network adapter	✓	✗
Boot from a SCSI VHDX or virtual DVD ISO	✗	✓
Boot from IDE Controller VHD or virtual DVD ISO	✓	✗
Boot from virtual floppy VFD	✓	✗

Generation 2 Boot Methods

Boot method	Gen 1	Gen 2
PXE boot by using a standard network adapter	✗	✓
PXE boot by using a legacy network adapter	✓	✗
Boot from a SCSI VHDX or virtual DVD ISO	✗	✓
Boot from IDE Controller VHD or virtual DVD ISO	✓	✗
Boot from virtual floppy VFD	✓	✗

Generation 2 Boot Methods

Boot method	Gen 1	Gen 2
PXE boot by using a standard network adapter	✗	✓
PXE boot by using a legacy network adapter	✓	✗
Boot from a SCSI VHDX or virtual DVD ISO	✗	✓*
Boot from IDE Controller VHD or virtual DVD ISO	✓	✗
Boot from virtual floppy VFD	✓	✗

Generation 2 Boot Methods

Boot method	Gen 1	Gen 2
PXE boot by using a standard network adapter	✗	✓
PXE boot by using a legacy network adapter	✓	✗
Boot from a SCSI VHDX or virtual DVD ISO	✗	✓
Boot from IDE Controller VHD or virtual DVD ISO	✓	✗
Boot from virtual floppy VFD	**✓**	**✗**

Implement Enhanced Session Mode

Enables redirection of locally-attached devices like those used in RDP sessions

Enabled by default on hosts running Windows 8/8.1/10

Disabled by default on hosts running Windows Server 2012/2012 R2/2016

Not available for Generation 1 VMs and VMs running non-Windows OSs

Guest VM must run Windows 8.1/10 or Windows Server 2012 R2/2016 and have Remote Desktop Services enabled

Implement Discrete Device Assignment

Enables supported PCI Express devices to be directly connected to a VM

Used to bypass virtualization and increase performance for VM activities

DDA is Microsoft's first attempt at pass-through similar to Citrix and VMware

Used most often to pass-through GPU and NVMe drives to VMs

Add-VMAssignableDevice

Implement Secure Boot

Feature of UEFI that ensures each component loaded during boot is digitally signed and validated

Not supported on BIOS or Gen 1 VMs

Validation is done against trusted certificates present in UEFI firmware

Windows OS bootloader is signed by Microsoft at C:\Windows\Boot\EFI

Confirm-SecureBootUEFI

Implement Secure Boot for Linux

Disable secure boot

Sign bootloader with Microsoft certificate at https://sysdev.Microsoft.com

Sign bootloader with locally-trusted certificate and certificate trust chain

“FreeBSD on Hyper-V is primarily targeted towards our appliance vendor partners [to ensure their products run] in on premises environments as well as Microsoft Azure”

– TechNet

https://blogs.technet.microsoft.com/hybridcloud/2015/10/20/microsoft-loves-linux-deep-dive-5-freebsd-on-hyper-v

“FreeBSD on Hyper-V is primarily targeted towards our appliance vendor partners [to ensure their products run] in on premises environments as well as Microsoft Azure”

– TechNet

https://blogs.technet.microsoft.com/hybridcloud/2015/10/20/microsoft-loves-linux-deep-dive-5-freebsd-on-hyper-v

“FreeBSD on Hyper-V is primarily targeted towards our appliance vendor partners [to ensure their products run] in on premises environments as well as Microsoft Azure”

– TechNet

https://blogs.technet.microsoft.com/hybridcloud/2015/10/20/microsoft-loves-linux-deep-dive-5-freebsd-on-hyper-v

"FreeBSD on Hyper-V is primarily targeted towards our appliance vendor partners [to ensure their products run] in on premises environments as well as Microsoft Azure"

– TechNet

https://blogs.technet.microsoft.com/hybridcloud/2015/10/20/microsoft-loves-linux-deep-dive-5-freebsd-on-hyper-v

FreeBSD Integration Services

Integration Services distribution for FreeBSD is different than for Linux

Unlike Linux, there is only one FreeBSD

Unlike Linux, no subsequent “distributions”

The FreeBSD Foundation is responsible for the OS kernel and all drivers and libraries

Microsoft delivers Integration Services directly to the FreeBSD community for acceptance and inclusion in latest release

What This Module Covered

Create and configure Generation 1 and 2 VMs and determine appropriate usage scenarios

Manage Integration Services

Add or remove memory in a running VM

Configure dynamic memory

Configure smart paging

Configure NUMA support

Configure Resource Metering

Implement enhanced session mode

What This Module Covered[2]

Move and convert VMs from previous versions of Hyper-V to Windows Server 2016 Hyper-V

Export and import VMs

Implement Discrete Device Assignment

Create Linux and FreeBSD VMs

Install and configure Linux Integration Services

Install and configure FreeBSD Integration Services

Implement Secure Boot for Windows and Linux environments