Commercial Licensing brief

Licensing Windows Server for use with virtualization technologies

(VMware ESX/ESXi, Microsoft System Center Virtual Machine Manager, Virtuozzo and Azure HUB)

This brief applies to all Microsoft Commercial Licensing programs.

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Summary

This document discusses how Microsoft Windows Server is licensed when used with virtualization technologies like VMware ESX/ESXi, Microsoft System Center (Virtual Machine Manager component), or Virtuozzo or under the Microsoft Azure Hybrid Use Benefit.

What's new in this brief?

This brief replaces a previous version published in November 2013. It has been updated to reflect licensing changes introduced with the launch of Windows Server 2016 and streamlined to focus on virtualization.

Introduction and foundational licensing information

With the growing prevalence of virtualization technologies, many customers ask how they should license Windows Server products with these technologies. Before delving into licensing details and examples, however, it is useful to

review some basic licensing concepts to understand how they apply in virtualized scenarios. With the launch of Windows Server 2016, server licensing transitioned to a core-based model and the processor-based server licensing model has been retired.

- Windows Server 2016 is licensed under the Per Core + Client Access License (CAL) model. More information on Windows Server core licensing can be found by downloading the Windows Server 2016 Licensing Guide

- Legacy customers who still have rights to use earlier versions of Windows Server under the processor-based licensing model can find more information by downloading the Windows Server 2012 R2 Licensing Guide.

For foundational licensing information on topics such as assignment of licenses, storing instances, licensing running instances of the software, licensing for peak capacity, running prior versions or other editions, and details on CALs and External Connectors, customers should review the licensing guide for the appropriate software version.

Clustering, failing over, and moving instances

In addition to understanding foundational licensing concepts mentioned above, it is helpful to understand how software is typically deployed and used. Two common scenarios for higher availability and dynamic datacenters involve:

- Running the same workload simultaneously on two servers, or
- Running a workload on a primary server and periodically moving it to a second server due to a failure, load balancing, patching, or planned downtime.

In both scenarios, regardless of whether the workloads are running in physical or virtual operating system environments (or OSEs), each server must have the appropriate number of licenses assigned to it prior to the workload running on it. This holds true regardless of whether you plan the workload to:

- Always run on a single server.
- Run in parallel on the server as a backup when the primary server fails.
- Run the workload if the primary server is down.
- Load balance when the primary server has high use.
- Only run the workload during maintenance.

Figures 2A, 2B, and 2C demonstrate three examples of usage scenarios that are properly licensed.

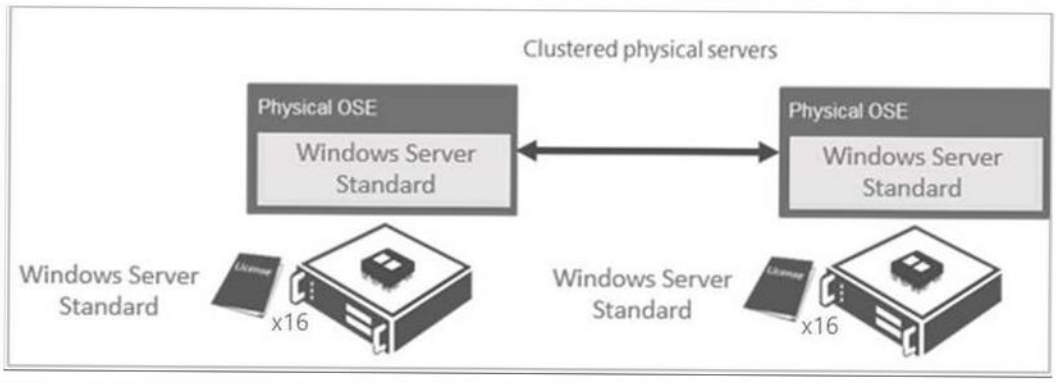

Figure 2A. Example: The servers are clustered, each licensed with Windows Server, and both running the same workload in parallel.

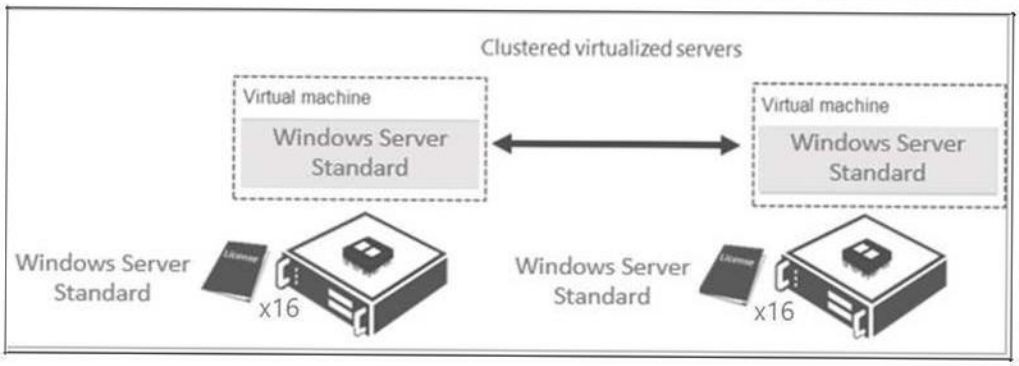

Figure 2B. Example: The servers are clustered, each licensed with Windows Server and both running the same virtualized workload in parallel.

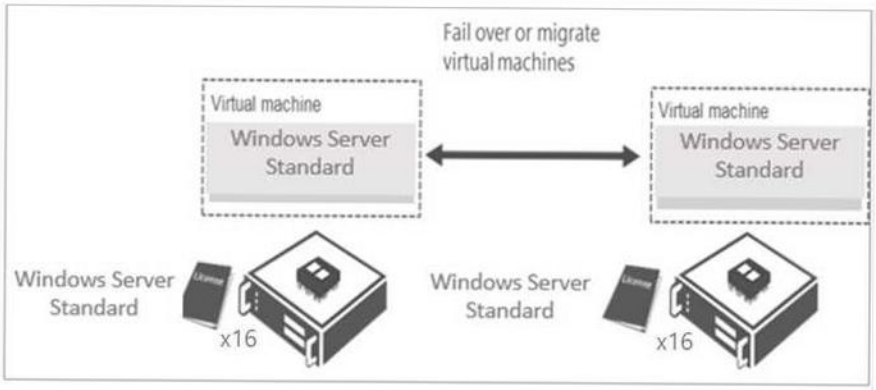

Figure 2C. Example: Both servers are licensed with Windows Server. The workload is moved from the first server to the second server.

Because a server running Windows Server Standard must have assigned licenses equal to the number of physical cores on the server (subject to a minimum of eight per processor and sixteen per server) for every two running instances, you need to consider what the peak capacity for the server will be. Even if you typically only need two running instances, you must license for the peak capacity if you occasionally need more than two at the same time.

Licensing Windows Server for use as a host and guest OS

Windows Server licensing permits use of the software in both the physical OSE (an instance of the software serving as the host operating system (or OS) in the case of a virtualized server) and virtual OSEs (instances of the software running as guest OS's). If Windows Server is deployed on a server is running a hypervisor on bare metal (directly on top of the server hardware), such as VMware's ESX/ESXi, then Windows Server will not be deployed as a host OS in the physical OSE. However, the guest OS instances deployed and running in virtual OSEs on the server still must be appropriately licensed. This means licenses must be assigned to the server for all the physical cores on the server (subject to a minimum of eight per processor and 16 per server). Standard edition will allow up to two instances on each fully licensed server (plus a third instance in the physical OSE, if it is used solely to host and manage virtual OSEs) and Datacenter edition will allow an unlimited number of instances on each fully licensed server. (The right to run an instance of Windows Server in the physical OSE is not relevant in the case of ESX/ESXi hosting the virtualization layer.)

If you assign enough Windows Server Standard core licenses to fully re-license the server running ESX/ESXi as the host OS, then you may run up to four virtual instances of Windows Server Standard at a time. You may not run a fifth virtual instance (e.g., in place of an instance in the physical OSE). You could, however, run a fifth instance of Windows Server, in lieu of ESX/ESXi, as the host OS (a physical instance on top of the server hardware), solely for purposes of managing your virtualization workload.

Introducing containers from Microsoft

Introduced to Windows Server Standard and Datacenter editions with the launch of Windows Server 2016, containers are the next evolution in virtualization and empower software developers to create the next generation of applications experiences. A container is an isolated, resource controlled, and portable operating environment where an application can run without affecting the rest of the system and without the system affecting the application. Other advantages of containers include speed, simplified DevOps, and increased flexibility in application development.

- Windows Server containers provide application isolation through process and namespace isolation technology. A Windows Server container shares a kernel with the container host and all containers running on the host.
- Hyper-V containers expand on the isolation provided by Windows Server Containers by running each container in a highly optimized virtual machine. In this configuration, the kernel of the container host is not shared with the Hyper-V Containers.

Windows Server Standard edition provides rights to use instances of the software in two OSEs or two Hyper-V containers and unlimited Windows Server containers when all cores on the server are licensed (subject to a minimum of 8 core licenses per physical processor and a minimum of 16 core licenses per server). As mentioned above, Standard edition provides the right to use Windows Server as the Host OS (in addition to two guest OS's), if it is used solely to host and manage virtualized workloads. Datacenter edition provides rights to use Windows Server in unlimited OSEs, Hyper-V containers, and Windows Server containers when all cores on the server are licensed (subject to the same minimums).

Learn more about containers by visiting Windows Server 2016 or by reading about Windows Containers.

Licensing Windows Server for use with VMware vMotion and Microsoft System Center Virtual Machine Manager

The same licensing rules apply when using Windows Server with VMware vMotion and System Center Virtual Machine Manager. While VMware vMotion and System Center Virtual Machine Manager move virtual OSEs between physical servers, the licenses remain with the physical server to which they were assigned. When an OSE is moved to a new physical server, that new server must already have appropriate licenses assigned to it (see the Clustering, failing over,

and moving instances section). As Windows Server Datacenter permits an unlimited number of instances of the server software to run in virtual OSEs, in multi-server installations with VMware vMotion, and System Center Virtual Machine Manager, it offers the greatest flexibility to move OSEs between servers without having to track the number of instances running or worry about being under-licensed.

For Windows Server software, except in a few cases, licenses may only be reassigned to new hardware after 90 days. This, however, does not restrict the dynamic movement of virtual OSEs between licensed servers. As long as the servers are licensed and each server individually does not run more instances than the number for which it is licensed, you are free to use VMware vMotion and System Center Virtual Machine Manager to move virtual OSEs between licensed servers at will.

Licensing Windows Server for use with Virtuozzo

Virtuozzo software creates running instances of Windows Server in virtual OSEs. This is another container technology. These virtual OSEs share the same kernel of the host Windows Server operating system, but have isolated registry settings, operating system libraries, operating system processes, and application software. These virtual OSEs also enable separate machine identity or administration rights.

As with use with other virtualization technologies, each physical and virtual running instance of Windows Server must be licensed. Because every instance shares the same kernel as the host operating system, Virtuozzo is technically unable to run more than one edition of Windows Server on the physical server. As a result, you must choose a single edition when using Virtuozzo.

Licensing Windows Server for use on Microsoft Azure

With Software Assurance coverage for Window Server Standard and/or Datacenter, you have the additional option of running Windows Server in virtual machines in Microsoft Azure under the Azure Hybrid Benefit for Windows Server. For every 2-processor Windows Server license or set of 16 Windows Server core licenses with Software Assurance, you can run either of the following at the base compute rate:

• Up to two virtual machines with up to 8 virtual cores or

• One virtual machine with up to 16 virtual cores.

You can also run virtual machines with more than 16 virtual cores by stacking licenses. For example, for two 2-processor licenses or two 16-core license packs, you may run a virtual machine with up to 32 virtual cores.

When using the Azure Hybrid Benefit for Windows Server under Datacenter licenses, deployment in Azure would be in addition to running workloads under the same licenses in your own data center. For Standard licenses, the licenses used under Azure Hybrid Benefit for Windows Server will be deemed "assigned" and may not be redeployed in your data center sooner than 90 days after the benefit is invoked on Azure servers.

For more information about Azure Hybrid Benefit for Windows Server, see the Product Terms and read about the Azure Hybrid Benefit for Windows Server.

Additional resources

- Licensing guides:
  - Windows Server 2016 Licensing Guide
  - Windows Server 2012 R2 Licensing Guide

Licensing Windows Server for use with virtualization technologies

- Microsoft Virtualization solutions
- Commercial Licensing briefs:
  - Licensing Microsoft server products in virtual environments
  - Per Core Licensing
- Commercial Licensing Product Terms
- Microsoft License Advisor