

Custom CPU Core counts for Microsoft licensed workloads on VMware Cloud on AWS

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Did you know you can limit application execution to a specific set of CPU cores, thereby saving money by being able to buy only software licenses that you need? This article will discuss the VMware's Custom CPU Core count feature and some of its implications for using Microsoft Software on VMware Cloud on AWS.

In February of 2019, VMware announced support for Custom CPU Core Count capability on VMware Cloud on AWS SDDC's. See full announcement here:

[Significantly cut application licensing costs by using the new VMware Cloud on AWS feature Custom CPU Core Count - VMware Cloud Community](#)

The Custom CPU Core Count capability gives you more flexibility in configuring SDDC clusters. The default values for the number of physical cores are 36 for i3 host type and 48 for i3en host type. Now, you have an option of selecting 8 or 16 CPU cores per host for I3, or selecting 8, 16, 24, 30 or 36 CPU cores for i3en host type. This allows you to select only the number of CPU cores you think you'll need for your workloads and minimize the risk of paying for underutilized CPU capacity. In turn, this approach might help to significantly reduce the costs for running mission-critical applications licensed on a per core basis. You can learn more about this feature [here](#).

But how does this work if you have Microsoft licensed workloads running on VMware Cloud on AWS hosts? Let's take an in depth look at the Microsoft licensing rules for the two most popular pieces of Microsoft software on VMware, Windows Server and Microsoft SQL Server.

Windows Server License Model

Windows Server 2019 is licensed by the **Per Core/CAL** model. This is an important distinction, as the licensing rules for just **Per Core** licensing model are different and don't apply to Windows Server 2019.

Microsoft's Per Core/CAL license model **requires** the customer to have acquired use rights for all the physical cores on the server on which they run an instance of the software. The licensed server must be assigned a minimum of 16 core licenses subject to a minimum of eight core licenses per physical processor. The greater of these two minimum requirements would equal the minimum number of licenses any server running an instance of the software must have. For more information on the licensing model, see the Core Terms in the Universal Terms Section in Product Use Rights doc at the [Microsoft Licensing Web site](#)

Windows Server 2016 Standard and Datacenter editions are licensed differently. With the launch of Windows Server 2016 Datacenter edition and Windows Server 2016 Standard edition, Windows Server licensing transitioned from being processor-based to being core-based. For both Standard and Datacenter editions, the minimum number of core licenses required equals the number of physical cores on the licensed server, subject to a minimum of 8 core licenses per physical processor and a minimum of 16 core licenses per server.

Do the minimum licensing requirements apply to all servers? Yes. Regardless of the number of physical processors or physical cores on a server, the number of core licenses required equals the number of physical cores on the licensed server, subject to a minimum of 8 core licenses per physical processor and a minimum of 16 core licenses per server.

Do you have to license all cores on the server, even if they are disabled? Yes, Microsoft's use rights require all physical cores on all physical processors on a server to be sufficiently covered by a license, even if a processor has been disabled. See the Core Universal Terms in Product Terms document.

SQL Server License Model

The license model for SQL Server 2019 is different from Windows Server 2019. SQL Server is governed by the Per Core licensing model, rather than the Per Core/CAL licensing model.

For VMC on AWS, there is only one way to calculate use rights for SQL server running in a virtual environment using the Per Core licensing model. As with Windows Server, Microsoft's use rights require all physical cores on all physical processors on a server to be covered by a license even in a processor has been disabled.

Licensing by Physical Core on a Server

When running an instance of the software in a physical OSE, all physical cores on the server must be licensed. Software partitioning or custom system bios control does not reduce the number of core licenses required. A minimum of four core licenses is required for each physical processor on the server.

Licensing by Individual Virtual OSE.

When licensing per Individual Virtual OSE the number of physical cores on a server is not relevant. You would license each CPU assigned to your Virtual Machine.

[How do these Rules Affect the Bring Your Own License \(BYOL\) Model?](#)

BYOL (bring your own license)

If you still have BYOL use rights for Windows Server or SQL Server (i.e. acquired before October 1,2019) than you follow the same rules for assigning licenses to dedicated outsourced hardware as you would for on premises dedicated hardware. You aren't allowed to disable the physical cores, or to have your outsourcer disable the cores. You would need to completely remove the physical cores and physical processor from the servers.

VMware Cloud on AWS SPLA Windows & SQL Servers 2019 licenses

[VMware's Custom Core Count feature](#) enables a VMC on AWS customer to scope. We hope this offers some clarity. However, for the purpose of calculating entitlements to Windows Server and SQL Server, Microsoft still requires a minimum pre-configured core count. Accordingly, our offering is set with a fixed number of cores per host, for example, i3 hosts have 36 cores per host, and i3en have 48 cores per host. However, Microsoft's license specifically forbids using custom core counts, as mentioned in Microsoft Product Terms on the Microsoft Licensing Web site previously.

Although, if a customer wanted to use the Custom Core Count feature for other reasons, they can do that. However, it will not reduce the minimum pre-configured core count, nor the cost of Microsoft's licensing for that host.

If you have any questions, please reach out: vmc-microsoft-licensing@vmware.com.