

Introduction to Per Core Licensing and Basic Definitions

This brief applies to all Volume Licensing programs.

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Summary

The purpose of this brief is to provide definitions of key terms related to server licensing and introduce the basics of the Per Core licensing model.

What's New in This Brief

This brief replaces a previous version published in March 2013.

Definitions

Assigning a license: Assigning a license means that you designate that license for one device or user. This designation avoids sharing a license across more than one device or user simultaneously. For example, after you have assigned a software license to a server, you are permitted to run the software on that server. You can use whatever manual or technical method that works for you to ensure that you have the correct number of licenses to cover your software use.



Figure 1: Assigning a license

Introduction to Per Core Licensing and Basic Definitions

Core factor: A numerical value associated with a specific physical processor for purposes of determining the number of licenses required to license all of the physical cores on a server. Refer to the [SQL Server Core Factor Table](#) for core factors for specific processors.

Data center: A building (or multiple buildings) that houses servers and ancillary equipment typically used in a corporate computing environment connected by a local area network (LAN).

Hardware thread: A hardware thread is either a physical core or a hyper-thread in a physical processor.

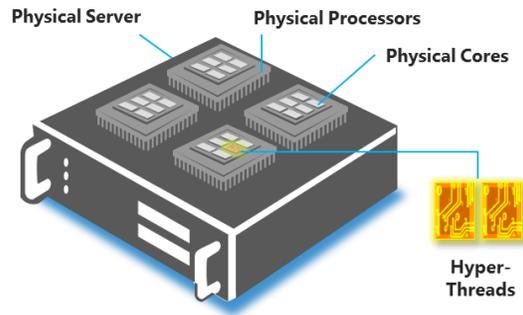


Figure 2: Physical server showing physical processors, physical cores, and hardware threads

Instance: An instance of software is the set of files that make up the software, stored in executable form, and ready to run. You create an instance of software by executing the software's setup or install procedure, or by duplicating an existing instance. Instances of software can run on physical or virtual hardware systems.

Examples:

- ▶ An installed copy of the Windows Server 2012 R2 operating system on a hard disk is an instance of Windows Server 2012 R2.
- ▶ An installed copy of Microsoft Exchange Server 2013 within a virtual hard drive (VHD) (or other image format) file is an instance of Exchange Server 2013.
- ▶ A VHD file with Exchange Server 2013 installed on top of Windows Server 2012 R2 contains an instance of Windows Server 2012 R2 and an instance of Exchange Server 2013. Copying that VHD file creates another instance of Windows Server and another instance of Exchange Server. Deploying that VHD file to another server creates an instance of Windows Server and an instance of Exchange Server on that server.

Run an Instance: You run an instance of software by loading it into memory and executing one or more of its instructions. Once this has occurred, an instance is considered to be running (whether or not its instructions continue to execute) until it is removed from memory.

Server: A server is a physical hardware system capable of running server software. A hardware partition or blade is considered to be a separate physical hardware system, and, therefore, a separate server.

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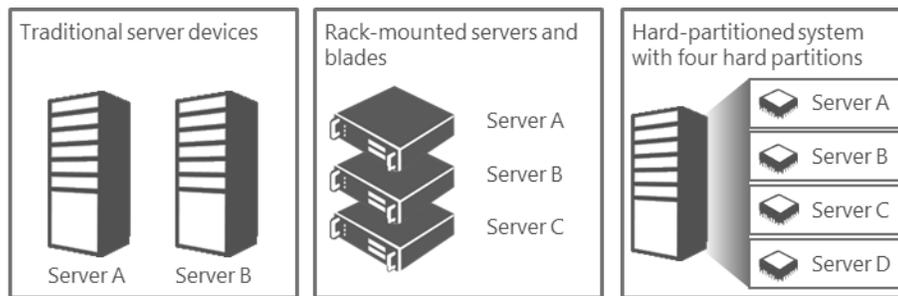


Figure 3: Different types of servers

Operating system environment (OSE): all or part of an operating system instance, or all or part of a virtual (or otherwise emulated) operating system instance which enables separate machine identity (primary computer name or similar unique identifier) or separate administrative rights, and instances of applications, if any, configured to run on the operating system instance or parts identified above. There are two types of OSEs, physical and virtual. A physical hardware system can have one physical OSE and/or one or more virtual OSEs.

Physical core: Each physical processor contains smaller processing units called physical cores. Some processors have two cores, some four, some six or eight, and so on.

Physical OSE: An OSE that is configured to run directly on a physical hardware system. The operating system instance used to run hardware virtualization software (for example, Microsoft Hyper-V Server or similar technologies) or to provide hardware virtualization services (for example, Microsoft virtualization technology or similar technologies) is considered part of the physical OSE.
Physical processor: A processor in a physical hardware system. Physical OSEs (see “Operating System Environment (OSE)”) use physical processors.

Server farm: A server farm consists of up to two data centers each physically located in the following areas:

- ▶ In a time zone that is within four hours of the local time zone of the other (Coordinated Universal Time [UTC] and not Daylight Saving Time [DST]), and/or
- ▶ Within the European Union (EU) and/or European Free Trade Association (EFTA)

Each data center can be part of only one server farm. You can reassign a data center from one server farm to another, but not on a short-term basis (that is, not within 90 days of the last assignment).

Service provider: A service provider is an organization that provides services, such as software or hosting services, to other organizations.

Virtual core: The unit of processing power in a virtual (or otherwise emulated) hardware system. A virtual core is the virtual representation of one or more hardware threads. Virtual OSEs use one or more virtual cores.

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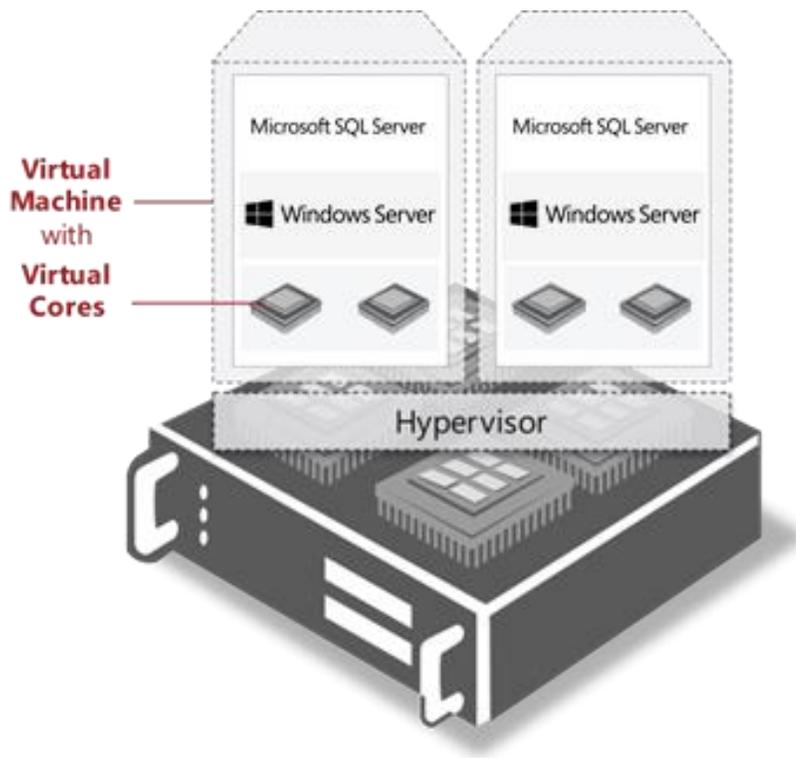


Figure 4: Virtual Machine (VM) using virtual cores

Virtual OSE: An OSE that is configured to run on a virtual (or otherwise emulated) hardware system.

Virtual processor: A virtual processor is a processor in a virtual (or otherwise emulated) hardware system. Virtual OSEs use virtual processors. For licensing purposes, a virtual processor is considered to have the same number of threads and cores as each physical processor on the underlying physical hardware system.

Introduction to Per Core Licensing

With the release of Microsoft SQL Server 2012, a new licensing model was introduced for licensing server software based on computing power. In this computing-power based license model, the measure of computing power is shifting from physical processors to cores. Core-based licensing provides a more precise measure of computing power and a more consistent licensing metric, regardless of whether solutions are deployed on physical servers on-premises, or in virtual or cloud environments.

Under the Per Core licensing model, each server running SQL Server software or any of its components (such as Reporting Services or Integration Services) must be assigned an appropriate number of SQL Server core licenses. The number of core licenses needed depends on whether you are licensing the physical server or individual virtual Operating System Environments (OSEs).

Unlike the Server+CAL licensing model, the Per Core model allows access for an unlimited number of users or devices to connect from either inside or outside an organization's firewall without the need for a CAL.

Introduction to Per Core Licensing and Basic Definitions

You have the following two options for licensing under the per core licensing model:

1. **Individual Virtual OSE.** You can license based on individual virtual OSEs within the server that are running the server software. If you choose this option, for each virtual OSE in which you run the server software, you need a number of licenses equal to the number of virtual cores in the virtual OSE, subject to a minimum requirement of four licenses per virtual OSE. In addition, if any of these virtual cores is at any time mapped to more than one hardware thread, you need a license for each additional hardware thread mapped to that virtual core. Those licenses count toward the minimum requirement of four licenses per virtual OSE.
2. **Physical Cores on a Server.** You can license based on all of the physical cores on the server. If you choose this option, the number of licenses required equals the number of physical cores on the server multiplied by the applicable core factor located in the [SQL Server Core Factor Table](#).

Additional Resources

For details about licensing Microsoft SQL Server 2014, refer to the SQL Server Licensing Reference Guide.

For details about licensing server products in virtualized environments, please refer to the [Licensing Microsoft Server Products in Virtual Environments Volume Licensing Brief](#).

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