

Microsoft Software Solution Product Guide

Product Guide

Microsoft and Lenovo have been partners for over 25 years. Together we ensure that the latest Microsoft technologies work perfectly with Lenovo ThinkSystem infrastructure and ThinkAgile solutions to provide the most reliable, secure and high-performing datacenters for our customers. Built with proven Lenovo innovation, Lenovo ThinkSystem servers and ThinkAgile solutions extend Microsoft's operating systems, virtualization technologies, and infrastructure platforms so you can build a highly productive IT environment that can help your business achieve true innovation.

Lenovo has proven experience in developing and delivering Microsoft-based solutions that help customers modernize and simplify their IT infrastructure to dramatically drive down operating costs and open the door to cutting-edge innovations. Built around the latest Lenovo ThinkSystem servers and networking hardware, the Lenovo solution with Microsoft provides businesses with an affordable, interoperable, and reliable industry-leading solution to manage their virtualized workloads.



Did you know?

Lenovo XClarity Integrator integrates Lenovo XClarity Administrator into Microsoft software, providing the functionality you need to manage Lenovo infrastructure right in the console of Microsoft software. Lenovo XClarity Administrator is a centralized resource management solution that reduces complexity, speeds up response, and enhances the availability of Lenovo ThinkSystem infrastructure and ThinkAgile solutions.

Lenovo offers XClarity Integrator for Windows Admin Center, Microsoft Azure Log Analytics and Microsoft System Center. For more information, refer to the Lenovo XClarity Administrator Product Guide, <https://lenovopress.com/tips1200-lenovo-xclarity-administrator>.

Why buy Microsoft licenses from Lenovo?

Lenovo offers various types and forms of Microsoft licensing so organizations and partners can leverage best in class Lenovo servers to build agile IT infrastructure that is reliable, secure, and high performing. Choosing a Microsoft OEM license from Lenovo for most customers is the simplest and most cost effective license. Microsoft licenses from Lenovo are specifically pre-tested and optimized to install on Lenovo servers. Lenovo offers support for all of its Microsoft offerings, giving customers a single point of support for their entire datacenter.

Lenovo holds more world record benchmarks than anyone with SQL Server from Microsoft. Lenovo is the first company to publish a non-clustered TPC-H@10,000GB benchmark performance result running Microsoft SQL Server. Refer to <https://lenovopress.com/lp0720-sr950-tpch-benchmark-result-2017-07-11>. When you purchase Microsoft SQL Server from Lenovo, you have support and access to the industry-leading Lenovo Engineering team that made this benchmark performance possible.

With co-located engineering organizations and a history of technical collaboration, Microsoft and Lenovo consistently deliver innovative joint solutions for the data center. Lenovo's leadership in reliability, customer satisfaction, and performance, combined with Microsoft's reputation in software and cloud services, continues to deliver innovative data-center solutions and lower total cost of ownership for our joint customers.

With Lenovo, customers have access to decades of datacenter expertise, industry leading support services and the option to leverage Lenovo consultative, professional, and managed service offerings. Lenovo provides customers with the best solution to generate the business results they are looking to achieve, while leveraging a single partner for all aspects of support and services.

Microsoft Subscription Licenses

Microsoft offers a variety of Windows Server and SQL server subscription licenses in in both 1-year and 3-years terms. Microsoft subscription licenses provide customers with latest software versions, complete mobility, and continuous support among other benefits. Below is a comparison between perpetual and subscription licenses from Microsoft:

Table 1. Microsoft Subscription Licenses

	Perpetual Licenses	Subscription Licenses
Mobility	No	Yes
Version	Specific	Latest (always)
Updates	Needed	N/A
Upgrades	Available	N/A
Support	Till EOL	Continuous
Renewal	N/A	Required (end-of-Term)

Windows Server Subscriptions

Microsoft offers the following Windows Server subscriptions, both in 1-year and 3-year terms:

- Windows Server CAL (Device)
- Windows Server CAL (User)
- Windows Server RMS CAL (Device)
- Windows Server RMS CAL (User)
- Windows Server Standard (8 Cores)
- Windows Server Remote Desktop (User)

For more information regarding features and applications for WS version, please visit the Microsoft Windows Server page at <https://www.microsoft.com/en-us/windows-server>. To order Windows Server subscriptions, please refer to the [Microsoft Subscription Licenses](#) section.

SQL Server Subscriptions

Microsoft offers the following SQL Server subscriptions, both in 1-year and 3-year terms:

- Microsoft SQL Server Standard (2 Cores)
- Microsoft SQL Server Enterprise (2 Cores)

For more information regarding SQL Server 2019, please visit the Microsoft SQL Server page at <https://www.microsoft.com/en-us/Licensing/product-licensing/sql-server?activetab=sql-server-pivot:primaryr2&rtc=1>. To order SQL Server subscriptions, please refer to table “Microsoft Subscription Licenses – Part Numbers” below.

Table 2. Microsoft Subscription Licenses – Part Numbers

Description	Part number
Windows Server	
Windows Server CAL - 1 Device CAL - 1 year Subscription	7S0T0005WW
Windows Server CAL - 1 Device CAL - 3 year Subscription	7S0T0006WW
Windows Server CAL - 1 User CAL - 1 year Subscription	7S0T0007WW
Windows Server CAL - 1 User CAL - 3 year Subscription	7S0T0008WW
Windows Server RMS CAL - 1 Device CAL - 1 year Subscription	7S0T0009WW
Windows Server RMS CAL - 1 Device CAL - 3 year Subscription	7S0T000AWW
Windows Server RMS CAL - 1 User CAL - 1 year Subscription	7S0T000BWW
Windows Server RMS CAL - 1 User CAL - 3 year Subscription	7S0T000CWW
Windows Server Remote Desktop Services CAL-1 User CAL -1 Year Subscription	7S0T000FWW
Windows Server Remote Desktop Services CAL-1 User CAL -3 Year Subscription	7S0T000GWW
Windows Server Standard - 8 Core License Pack - 1 year Subscription	7S0T000DWW
Windows Server Standard - 8 Core License Pack - 3 year Subscription	7S0T000EWW
Microsoft SQL Server	
Microsoft SQL Server Enterprise - 2 Core License Pack - 1 year Subscription	7S0T0001WW
Microsoft SQL Server Enterprise - 2 Core License Pack - 3 year Subscription	7S0T0002WW
Microsoft SQL Server Standard - 2 Core License Pack - 1 year Subscription	7S0T0003WW
Microsoft SQL Server Standard - 2 Core License Pack - 3 year Subscription	7S0T0004WW

Microsoft Azure Plans

The Microsoft Azure cloud platform is more than 200 products and cloud services designed to help you bring new solutions to life—to solve today’s challenges and create the future. Build, run, and manage applications across multiple clouds, on-premises, and at the edge, with the tools and frameworks of your choice.

Only a single Azure Plan is required in order to order unlimited number of Azure Cloud Services. Amongst popular and high demand Azure Services are:

- Azure Stack HCI
- Azure Stack HUB
- Azure Backup
- Azure Storage
- Azure File Sync
- Azure Site Recovery
- Azure Monitor
- Azure Update Management
- Azure Virtual Machines
- Azure SQL Server

Please visit the following Azure page for a complete list of available Azure Cloud Services:

<https://azure.microsoft.com/en-us/services/>

All Azure Cloud Services are available by Lenovo through a single part number (PN). This PN registers customers to a Lenovo Azure Tenant portal. Through this portal, customers can activate and manage all Azure Cloud Services for their accounts. The following customer information is required at PoS (point of sale) for Lenovo to provide end-user access to Lenovo Azure Tenant portal:

- Valid contact name
- Valid contact email address
- Valid domain

To order an Azure Plan from Lenovo (support plan available), please refer to table “Azure Plan – Part Numbers” below:

Table 3. Azure Plan – Part Numbers

Description	Part number
Azure Cloud Services	
Azure Plan	7S0T000HWW
Lenovo Support for Azure Cloud – 1 year subscription**	7S0T000LWW

Microsoft is solely responsible for measuring and providing accurate Azure Cloud Services consumed by a customer’s Azure Plan. Lenovo will provide a monthly bill to customers or reseller partners based upon Microsoft’s Azure Plan consumption reports. For more information regarding Azure, please visit:

- [Microsoft Azure](#)
- [Azure Documentation](#)
- [Azure Pricing Estimator](#)

Microsoft Azure Reserved Instances

Microsoft Azure platform also provides a pre-paid discounted variation of a selected number of Azure Cloud Services. These services can be pre-paid for both 1-year and 3-years terms. End-users have the entire term to consume reserved instances of Azure Cloud Services.

Information regarding available Azure Cloud Service Reserved Instances and discounts can be found at [Microsoft's Azure Pricing Estimator page](#).

All Azure Cloud Services are available by Lenovo through a single part number (PN). This PN registers customers to a Lenovo Azure Tenant portal. Through this portal, customers can activate and manage all Azure Cloud Services for their accounts. The following customer information is required at PoS (point of sale) for Lenovo to provide end-user access to Lenovo Azure Tenant portal:

- Valid contact name
- Valid contact email address
- Valid domain

To order an Azure Reserved Instances from Lenovo (support plan available), please refer to table “Azure Reserved Instances – Part Numbers” below:

Table 4. Azure Reserved Instances – Part Numbers

Description	Part number
Azure Cloud Services	
Azure Reserved Instance – 1 year Term	7S0T000JWW
Azure Reserved Instance – 3 year Term	7S0T000KWW
Lenovo Support for Azure Cloud – 1 year subscription**	7S0T000LWW

Microsoft is solely responsible for measuring and providing accurate Azure Cloud Services consumed by a customer's Azure Plan. Lenovo will provide a monthly bill to customers or reseller partners based upon Microsoft's Azure Plan consumption reports. For more information regarding Azure, please visit:

- [Microsoft Azure](#)
- [Azure Documentation](#)

Lenovo Support for Azure Plan & Reserved Instances

Lenovo offers support for all Azure Plans and Azure Reserved Instances customers. Basic account support is offered free of charge. Account support includes:

- Billing questions
- Login issues
- Agreements
- Profile updates

For Azure Plans and Azure Reserved Instances technical support, Lenovo offers a 1-year subscription support plan. Technical support includes:

- Support Levels: Lenovo to provide L1/L2 support; Microsoft to provide L3 support
- Dedicated Support Team
- Availability: 24x7
- Geo Support: Support for each participating Geo/Country
- Languages: English Language Only
- Access: Single number to reach Cloud Services software support and ThinkAgile hardware support

To order an Azure Reserved Instances from Lenovo (support plan available), please refer to table “Azure Reserved Instances – Part Numbers” below:

Table 5. Lenovo Support for Azure Plan and Reserved Instances – Part Numbers

Description	Part number
Azure Cloud Services	
Lenovo Support for Azure Cloud – 1 year subscription**	7S0T000LWW

Windows Server editions and licensing

This section describes the editions and licensing for Windows Server:

- [Windows Server Licensing](#)
- [Core based licensing: Windows Server Standard and Datacenter](#)
- [Client Access License \(CAL\) & Remote Desktop Session \(RDS\) CAL](#)
- [Downgrade rights](#)

Windows Server 2019 are available in the following editions:

- **Essentials Edition:** ideal for small businesses with up to 25 users and 50 Small companies with basic IT needs purchasing a first server; likely a small or no dedicated IT department. CAL (Client Access Licensing) is not required with this edition
- **Standard Edition:** Ideal for customers with low density or minimally virtualized
- **Datacenter Edition:** Ideal for highly virtualized and software defined datacenter environments.
- **Storage Edition (2016 only)*:** For dedicated OEM storage Available in Standard and Workgroup editions through the OEM channel.

* **Note:** Windows Server 2019 is not available in Storage Edition. Customers using Windows Server 2016 Storage Edition should purchase the Windows Server 2019 Standard Edition.

Windows Server Licensing

Customers can purchase Windows Server licenses from Lenovo through the following ways:

- **CTO (Configure to Order)** – this is the OEM license that is added to the Lenovo server shipment at manufacturing and requires a Windows Server OS to be selected at the same time.
 - Core based or Server + CAL based
 - **Pre-Install** – The OEM license can be pre-installed onto the Lenovo server at manufacturing.
 - **DIB (Drop-in-Box)** – The media is shipped in the box with the server at manufacturing with or without Pre-Install.
- **ROK** – the Reseller Option Kit is sold by Lenovo’s authorized resellers and distributors
 - Core based only

Note: Only the pre-install license includes additional drivers or other installation enhancements that streamline the installation of the OS onto the server.

Client Access Licenses (CALs) can be per-user or per-device. Each user CAL permits one user, using any device, to access instances of the server software on their licensed servers. Each device CAL permits one device, used by any user, to access instances of the server software on their licensed servers.

Table 6. Windows Server Licensing

Editions	Licensing model	CAL requirements*
Windows Server Datacenter	Core-based	Windows Server CAL
Windows Server Standard	Core-based	Windows Server CAL
Windows Server Essentials	Processor- based	No CAL required
Windows Storage Server (2016 Only)	Processor- based	No CAL required

* Some additional or advanced functionality such as Remote Desktop Services or Active Directory Rights Management Services will continue to require the purchase of an additive CAL.

Core based licensing: Windows Server Standard and Datacenter

The licensing of Windows Server 2019 Standard and Datacenter editions are licensed per-core instead of per-processor. A minimum of 8 cores per processor and 16 cores total must be licensed. All cores must be licensed, even if disabled.

The Base License for the Lenovo OEM Microsoft Windows Server Standard and Datacenter editions (Reseller Option Kit/ROK and Factory Preinstalled) will cover up to 16 cores per system. Customers who need to license more than 16 cores can easily do so with Additional Licenses. Additional Licenses are available in 2 core packs.

- Servers are licensed based on the number of processor cores in the physical server. All physical cores in the server must be licensed.
- A minimum of 16 core licenses is required for each server.
- A minimum of 8 core licenses is required for each physical processor. Additional core licenses will be sold in packs of two.
- Eight 2-core packs will be the minimum required to license each physical server. The 2-core pack for each edition is one-eighth the price of a 2-processor license for corresponding Windows Server editions.
- Standard Edition provides rights for up to two OSEs or Hyper-V containers when all physical cores in the server are licensed. For every two additional VMs, all the cores in the server have to be licensed again.
- Existing customers’ servers under Software Assurance will receive core grants as required, with documentation.

- For more information, please refer to the Lenovo Windows Server Core Licensing Calculator: <https://www.lenovosalesportal.com/windows-server-2019-core-licensing-calculator.aspx>

Client Access License (CAL) & Remote Desktop Session (RDS) CAL

Windows Server 2019 and 2016 have the same licensing model. The Windows Server 2019 and 2016 licensing model includes both Core + Client Access Licenses (CALs). Each user and/or device accessing a licensed Windows Server Standard or Datacenter edition requires a Windows Server CAL or a Windows Server and a Remote Desktop Services (RDS) CAL.

A Windows Server CAL is required when a user or device is directly or indirectly accessing Windows Server. A Remote Desktop Service (RDS) CAL is also required for users that need to access programs or the full desktop remotely using Remote Desktop Services (RDSs). Both Windows Server CAL (user or device) and RDS CAL (user or device) are required for remote desktop access. RDS CALs contain a product key for activation. As an exception to these rules, up to two users or devices may access the server software, only for server administration purposes, without requiring either a RDS CAL or a Windows Server CAL.

Each user and device that connects to a Remote Desktop Session host needs a client access license (CAL). There are two types of RDS CALs: Device CALs and User CALs.

Each user CAL permits one user, using any device, to access instances of the server software on their licensed servers. Each device CAL permits one device, used by any user, to access instances of the server software on their licensed servers.

The following table outlines the differences between the two types of CALs.

Table 7. Comparison of per-device and per-user RDS CALs

Per Device RDS CALs	Per User RDS CALs
CALs are physically assigned to each device.	CALs are assigned to a user in Active Directory.
CALs are tracked and enforced by the license server.	CALs are tracked but not enforced by the license server.
CALs can be tracked regardless of Active Directory membership.	CALs cannot be tracked within a workgroup.
You can revoke up to 20% of CALs.	You cannot revoke any CALs.
Temporary CALs are valid for 52-89 days.	Temporary CALs are not available.
CALs cannot be overallocated.	CALs can be overallocated (in breach of the Remote Desktop licensing agreement).

Also refer to the [Windows Server Licensing FAQ](#) section below.

Downgrade rights

Microsoft Windows Server 2019 includes the right to use an earlier version of the software in place of the version you have licensed (e.g., downgrade from Windows Server 2019 to Windows Server 2016).

Customers that have Datacenter edition will be able to downgrade to any previous version or edition. Customers with Windows Server 2019, Standard edition customers will be able to downgrade to the previous version of Standard or new with this release, Enterprise edition.

Downgrade rights allows you to downgrade the bits only. The license rules of the purchased version still apply. For example, if a customer wants to downgrade from Windows Server 2019 Standard edition to Windows Server 2016 Enterprise edition, they can run the Enterprise bits, however the license will still cover two processors and allow for 2 virtual instances.

A downgrade kit includes the DVD media of the earlier version of Windows Server and product key for activation.

Windows Server 2019

This section provides information on Windows Server 2019 from Lenovo:

- [Features](#)
- [Feature codes for configure-to-order](#)
- [Part numbers for Reseller Option Kits](#)

Windows Server 2019 is the latest operating system from Microsoft and improves datacenter security, offers unprecedented hyperconverged infrastructure, allows for faster application innovation—all on a unique hybrid datacenter platform. Windows Server 2019 is designed and engineered to help modernize customers' datacenter.

Features

Enhanced security capabilities

For IT professionals, security and compliance are primary concerns. Windows Server 2019 provides capabilities to build high security datacenter environments.

- **Manage privileged identities.** Many breaches can be prevented by protecting administrator credentials. Windows Server 2019 ensure that all apps and system components have just enough access privilege.
- **Secure the operating system.** Discover and address security breaches with integrated Windows Defender Advanced Threat Detection. Help prevent host intrusion with Windows Defender Exploit Guard, which locks down devices against a wide variety of attack vectors and blocks behaviors commonly used in malware attacks.
- **Secure virtualization fabric.** Protect VM workloads from unauthorized access, with Shielded Virtual Machines for Windows Server or Linux workloads. Add another layer of protection for network traffic to and from a VM with Encrypted Subnets.

Hyper-converged Infrastructure

This new deployment model allows you to consolidate compute, storage, and networking into the same nodes allowing you to reduce the infrastructure cost while still getting better performance, scalability, and reliability. HCI gives you the flexibility to easily scale such deployments.

- **Enhanced storage spaces direct**—build software-defined storage using industry standard servers with local storage that can scale up to 1PB per storage pool in Windows Server 2016 and 4PB per storage pool and 64TB per volume in Windows Server 2019.
- **Mirror-accelerated parity**—lets you create volumes that are part mirror and part parity for 2x better performance on storage spaces direct deployments. Writes land first in the mirrored portion and are gradually moved into the parity portion.
- **Data deduplication**—provides volume savings of up to 90% by storing duplicate files on a volume once using logical pointers.
- **Virtual machine storage resiliency**—provides intelligent means to retain virtual-machine session states to minimize the impact of minor storage disruptions.
- **Deduplication for ReFS**—data deduplication is now supported on ReFS to optimize free space on a volume by examining the data for duplicated portions.

Windows Server 2019 CTO Feature Codes

The following tables list the configure-to-order (CTO) feature codes to order Windows Server 2019.

Table 8. Windows Server 2019 CTO Feature Codes

Description	Feature code
WINDOWS SERVER 2019 ESSENTIALS CTO (Processor Based)	
Windows Server 2019 Essentials - Chinese Simplified (factory installed)	S09R
Windows Server 2019 Essentials - English (factory installed)	S09S
Windows Server 2019 Essentials - Japanese (factory installed)	S09T
Windows Server 2019 Essentials - Spanish (factory installed)	S09U
Windows Server 2019 Essentials - Chinese Simplified (not preinstalled)	S09V
Windows Server 2019 Essentials - Chinese Traditional (not preinstalled)	S09W
Windows Server 2019 Essentials - Japanese (not preinstalled)	S09X
Windows Server 2019 Essentials - MultiLang (not preinstalled)	S09Y
WINDOWS SERVER 2019 STANDARD CTO (16 CORE)	
Windows Server 2019 Standard (16 core) - Chinese Simplified (factory installed)	S095
Windows Server 2019 Standard (16 core) - English (factory installed)	S096
Windows Server 2019 Standard (16 core) - Japanese (factory installed)	S097
Windows Server 2019 Standard (16 core) - Spanish (factory installed)	S098
Windows Server 2019 Standard (16 core) - Chinese Simplified (not preinstalled)	S099
Windows Server 2019 Standard (16 core) - Chinese Traditional (not preinstalled)	S09A
Windows Server 2019 Standard (16 core) - Japanese (not preinstalled)	S09B
Windows Server 2019 Standard (16 core) - MultiLang (not preinstalled)	S09C
WINDOWS SERVER 2019 DATACENTER CTO (16 CORE)	
Windows Server 2019 Datacenter (16 core) - Chinese Simplified (factory installed)	S09D
Windows Server 2019 Datacenter (16 core) - English (factory installed)	S09E
Windows Server 2019 Datacenter (16 core) - Japanese (factory installed)	S09F
Windows Server 2019 Datacenter (16 core) - Chinese Simplified (not preinstalled)	S09G
Windows Server 2019 Datacenter (16 core) - Chinese Traditional (not preinstalled)	S09H
Windows Server 2019 Datacenter (16 core) - Japanese (not preinstalled)	S09J
Windows Server 2019 Datacenter (16 core) - MultiLang (not preinstalled)	S09K
2019 TO 2016 ROK DOWNGRADE KIT CTO	
Win Svr Essentials 2019 to 2016 Downgrade Kit-Chin Simp	S0A0
Win Svr Essentials 2019 to 2016 Downgrade Kit-Chin Trad	S0A1
Win Svr Essentials 2019 to 2016 Downgrade Kit-Japanese	S0A2
Win Svr Essentials 2019 to 2016 Downgrade Kit-Multilanguage	S0A3
Win Svr Standard 2019 to 2016 Downgrade Kit-Chin Simp	S0A5
Win Svr Standard 2019 to 2016 Downgrade Kit-Chin Trad	S0A6
Win Svr Standard 2019 to 2016 Downgrade Kit-Japanese	S0A7
Win Svr Standard 2019 to 2016 Downgrade Kit-Multilanguage	S0A8
Win Svr Datacenter 2019 to 2016 Downgrade Kit-Chin Simp	S0AA
Win Svr Datacenter 2019 to 2016 Downgrade Kit-Chin Trad	S0AB
Win Svr Datacenter 2019 to 2016 Downgrade Kit-Japanese	S0AC

Description	Feature code
Win Svr Datacenter 2019 to 2016 Downgrade Kit-Multilanguage	S0AD
2019 TO 2012R2 ROK DOWNGRADE KIT CTO	
Win Svr Essentials 2019 to 2012R2 Downgrade Kit-Chin Simp	S2MK
Win Svr Essentials 2019 to 2012R2 Downgrade Kit-Chin Trad	S2ML
Win Svr Essentials 2019 to 2012R2 Downgrade Kit-Japanese	S2MM
Win Svr Essentials 2019 to 2012R2 Downgrade Kit-Multilanguage	S2MN
Win Svr Standard 2019 to 2012R2 Downgrade Kit-Chin Simp	S2MP
Win Svr Standard 2019 to 2012R2 Downgrade Kit-Chin Trad	S2MQ
Win Svr Standard 2019 to 2012R2 Downgrade Kit-Japanese	S2MR
Win Svr Standard 2019 to 2012R2 Downgrade Kit-Multilanguage	S2MS
Win Svr Datacenter 2019 to 2012R2 Downgrade Kit-Chin Simp	S2MT
Win Svr Datacenter 2019 to 2012R2 Downgrade Kit-Chin Trad	S2MU
Win Svr Datacenter 2019 to 2012R2 Downgrade Kit-Japanese	S2MV
Win Svr Datacenter 2019 to 2012R2 Downgrade Kit-Multilanguage	S2MW
WINDOWS SERVER 2019 CLIENT ACCESS LICENSES CTO (CALs)	
Microsoft Windows Server 2019 Client Access License (1 User)	S081
Microsoft Windows Server 2019 Client Access License (5 User)	S083
Microsoft Windows Server 2019 Client Access License (10 User)	S085
Microsoft Windows Server 2019 Client Access License (50 User)	S087
Microsoft Windows Server 2019 Client Access License (1 Device)	S080
Microsoft Windows Server 2019 Client Access License (5 Device)	S082
Microsoft Windows Server 2019 Client Access License (10 Device)	S084
Microsoft Windows Server 2019 Client Access License (50 Device)	S086
WINDOWS SERVER 2019 REMOTE DESKTOP SERVICES ACCESS LICENSES CTO	
Windows Server 2019 Remote Desktop Services Client Access License (1 User)	S089
Windows Server 2019 Remote Desktop Services Client Access License (5 User)	S08B
Windows Server 2019 Remote Desktop Services Client Access License (10 User)	S08D
Windows Server 2019 Remote Desktop Services Client Access License (50 User)	S08F
Windows Server 2019 Remote Desktop Services Client Access License (1 Device)	S088
Windows Server 2019 Remote Desktop Services Client Access License (5 Device)	S08A
Windows Server 2019 Remote Desktop Services Client Access License (10 Device)	S08C
Windows Server 2019 Remote Desktop Services Client Access License (50 Device)	S08E
ADDITIONAL LICENSE CTO	
Windows Server 2019 Standard Additional License (2 core) (No Media/Key) (POS Only*)	S08Z
Windows Server 2019 Datacenter Additional License (2 core) (No Media/Key) (POS Only*)	S090

* POS (point of sale) refers to licenses sold at point of original purchase. These are stacked on base licenses when the number of cores or processors exceeds those covered by the base OS license.

Windows Server 2019 ROK Part Numbers

The following table lists the Reseller Option Kit (ROK) part numbers.

Table 9. Windows Server 2019 ROK Part Numbers

Description	Part number
WINDOWS SERVER 2019 ESSENTIALS ROK (Processor Based)	
Windows Server 2019 Essentials ROK - Chinese Simplified	7S05001NWW
Windows Server 2019 Essentials ROK - Chinese Traditional	7S05001PWW
Windows Server 2019 Essentials ROK - Japanese	7S05001QWW
Windows Server 2019 Essentials ROK - MultiLang	7S05001RWW
WINDOWS SERVER 2019 STANDARD ROK (16 CORE)	
Windows Server 2019 Standard ROK (16 core) - Chinese Simplified	7S050012WW
Windows Server 2019 Standard ROK (16 core) - Chinese Traditional	7S050013WW
Windows Server 2019 Standard ROK (16 core) - Japanese	7S050014WW
Windows Server 2019 Standard ROK (16 core) - MultiLang	7S050015WW
WINDOWS SERVER 2019 DATACENTER ROK (16 CORE)	
Windows Server 2019 Datacenter ROK (16 core) - Chinese Simplified	7S050017WW
Windows Server 2019 Datacenter ROK (16 core) - Chinese Traditional	7S050018WW
Windows Server 2019 Datacenter ROK (16 core) - Japanese	7S050019WW
Windows Server 2019 Datacenter ROK (16 core) - MultiLang	7S05001AWW
2019 TO 2016 ROK DOWNGRADE KIT ROK	
Win Svr Essentials 2019 to 2016 Downgrade Kit - Chin Simp ROK	7S05001SWW
Win Svr Essentials 2019 to 2016 Downgrade Kit - Chin Trad ROK	7S05001TWW
Win Svr Essentials 2019 to 2016 Downgrade Kit - Japanese ROK	7S05001UWW
Win Svr Essentials 2019 to 2016 Downgrade Kit - Multilanguage ROK	7S05001VWW
Win Svr Standard 2019 to 2016 Downgrade Kit - Chin Simp ROK	7S05001WWW
Win Svr Standard 2019 to 2016 Downgrade Kit - Chin Trad ROK	7S05001XWW
Win Svr Standard 2019 to 2016 Downgrade Kit - Japanese ROK	7S05001YWW
Win Svr Standard 2019 to 2016 Downgrade Kit - Multilanguage ROK	7S05001ZWW
Win Svr Datacenter 2019 to 2016 Downgrade Kit - Chin Simp ROK	7S050020WW
Win Svr Datacenter 2019 to 2016 Downgrade Kit - Chin Trad ROK	7S050021WW
Win Svr Datacenter 2019 to 2016 Downgrade Kit - Japanese ROK	7S050022WW
Win Svr Datacenter 2019 to 2016 Downgrade Kit - Multilanguage ROK	7S050023WW
2019 TO 2012R2 ROK DOWNGRADE KIT ROK	
Win Svr Essentials 2019 to 2012R2 Downgrade Kit-Chin Simp ROK	7S05004YWW
Win Svr Essentials 2019 to 2012R2 Downgrade Kit-Chin Trad ROK	7S05004ZWW
Win Svr Essentials 2019 to 2012R2 Downgrade Kit-Japanese ROK	7S050050WW
Win Svr Essentials 2019 to 2012R2 Downgrade Kit-Multilanguage ROK-Brazil only	7S050051WW
Win Svr Essentials 2019 to 2012R2 Downgrade Kit-Multilanguage ROK	7S050052WW
Win Svr Standard 2019 to 2012R2 Downgrade Kit-Chin Simp ROK	7S050053WW
Win Svr Standard 2019 to 2012R2 Downgrade Kit-Chin Trad ROK	7S050054WW
Win Svr Standard 2019 to 2012R2 Downgrade Kit-Japanese ROK	7S050055WW
Win Svr Standard 2019 to 2012R2 Downgrade Kit-Multilanguage ROK-Brazil only	7S050056WW
Win Svr Standard 2019 to 2012R2 Downgrade Kit-Multilanguage ROK	7S050057WW
Win Svr Datacenter 2019 to 2012R2 Downgrade Kit-Chin Simp ROK	7S050058WW

Description	Part number
Win Svr Datacenter 2019 to 2012R2 Downgrade Kit-Chin Trad ROK	7S050059WW
Win Svr Datacenter 2019 to 2012R2 Downgrade Kit-Japanese ROK	7S05005AWW
Win Svr Datacenter 2019 to 2012R2 Downgrade Kit-Multilanguage ROK-Brazil only	7S05005BWW
Win Svr Datacenter 2019 to 2012R2 Downgrade Kit-Multilanguage ROK	7S05005CWW
WINDOWS SERVER 2019 CLIENT ACCESS LICENSES ROK (CALs)	
Microsoft Windows Server 2019 Client Access License (1 Device)	7S050024WW
Microsoft Windows Server 2019 Client Access License (1 User)	7S050025WW
Microsoft Windows Server 2019 Client Access License (5 Device)	7S050026WW
Microsoft Windows Server 2019 Client Access License (5 User)	7S050027WW
Microsoft Windows Server 2019 Client Access License (10 Device)	7S050028WW
Microsoft Windows Server 2019 Client Access License (10 User)	7S050029WW
Microsoft Windows Server 2019 Client Access License (50 Device)	7S05002AWW
Microsoft Windows Server 2019 Client Access License (50 User)	7S05002BWW
WINDOWS SERVER 2019 REMOTE DESKTOP SERVICES ACCESS LICENSES ROK	
Windows Server 2019 Remote Desktop Services Client Access License (1 Device)	7S05002CWW
Windows Server 2019 Remote Desktop Services Client Access License (1 User)	7S05002DWW
Windows Server 2019 Remote Desktop Services Client Access License (5 Device)	7S05002EWW
Windows Server 2019 Remote Desktop Services Client Access License (5 User)	7S05002FWW
Windows Server 2019 Remote Desktop Services Client Access License (10 Device)	7S05002GWW
Windows Server 2019 Remote Desktop Services Client Access License (10 User)	7S05002HWW
Windows Server 2019 Remote Desktop Services Client Access License (50 Device)	7S05002JWW
Windows Server 2019 Remote Desktop Services Client Access License (50 User)	7S05002KWW
ADDITIONAL LICENSE ROK	
Windows Server 2019 Standard Additional License (2 core) (No Media/Key) (APOS)*	7S05002LWW
Windows Server 2019 Standard Additional License (2 core) (No Media/Key) (Reseller POS Only) **	7S05002MWW
Windows Server 2019 Datacenter Additional License (2 core) (No Media/Key) (Reseller POS Only) **	7S05002NWW

* APOS licenses are used if the customer needs to add processors or VM rights to server after original purchase.

** POS (point of sale) refers to licenses sold at point of original purchase. These are stacked on base licenses when the number of cores or processors exceeds those covered by the base OS license.

Windows Server 2016

This section provides information on Windows Server 2016 from Lenovo:

- [Features](#)
- [Feature codes for configure-to-order](#)
- [Part numbers for Reseller Option Kits](#)

Windows Server 2016 is the cloud-ready operating system that supports your current workloads while introducing new technologies that make it easy to transition to cloud computing when you are ready. It delivers powerful new layers of security along with Azure-inspired innovation for the applications and infrastructure that power your business.

Features

Learn more about Windows Server 2016 features at this web page:

<https://docs.microsoft.com/en-us/windows-server/get-started/whats-new-in-windows-server-2016>

Windows Server 2016 CTO Feature Codes

The following table lists the Windows Server 2016 configure-to-order (CTO) feature codes.

Table 10. Windows Server 2016 CTO Feature Codes

Description	Feature code
WINDOWS STORAGE SERVER 2016 STANDARD CTO (Processor Based)	
Windows Storage Svr 2016 Standard-English (factory installed)	V2NZBG
Windows Storage Svr 2016 Standard-Japanese (factory installed)	V2N0BG
Windows Storage Svr 2016 Standard-ChinSimp (factory installed)	V2NWBG
Windows Storage Svr 2016 Standard-MultiLang (not preinstalled)	V2N2BG
Windows Storage Svr 2016 Standard-Japanese (not preinstalled)	V2N1BG
Windows Storage Svr 2016 Standard-ChinSimp (not preinstalled)	V2NXBG
Windows Storage Svr 2016 Standard-ChinTrad (not preinstalled)	V2NYBG

Windows Server 2016 ROK Part Numbers

The following table lists the Reseller Option Kit (ROK) part numbers.

POS (point of sale) refers to licenses sold at point of original purchase. These are stacked on base licenses when the number of cores or processors exceeds those covered by the base OS license.

Table 11. Windows Server 2016 ROK Part Numbers

Description	Part number
WINDOWS SERVER 2016 STORAGE ROK (16 CORE)	
Windows Storage Svr 2016 Standard ROK - MultiLang	01GU599
Windows Storage Svr 2016 Standard ROK - Japanese	01GU598
Windows Storage Svr 2016 Standard ROK - Chinese Simplified	01GU596
Windows Storage Svr 2016 Standard ROK - Chinese Traditional	01GU597

Windows Server Licensing FAQ

Additional information about licensing.

1. **Q: What types of Windows licenses does Lenovo offer?**

A: Lenovo offers OEM licenses for Windows Server, SQL Server as well as the associated CAL products. Please refer to the product list found at: <https://dcsc.lenovo.com/#!/software>.

2. **Q: What is the difference between ROK and DIB and Pre-installed offerings?**

A: ROK – the Reseller Option Kit is sold by Lenovo’s authorized resellers and distributors. It is comprised of OS installation media and a MS COA label affixed to the server chassis. Resellers may provide additional OS installation services to the customer.

DIB (Drop-In-Box) – Lenovo factory direct offering that ships OS installation media and a MS COA label affixed to the server chassis (for customers choosing do-it-yourself installations).

Pre-installed – Lenovo factory direct offering that ships OS installation media and MS COA label affixed to the server chassis and the OS factory installed in generic fashion onto the server’s mass storage using recent device drivers.

3. **Q: How is Windows Server 2019 licensed?**

A: Microsoft has moved licensing for Datacenter and Standard editions from processors to physical cores.

Datacenter Edition provides rights to run unlimited OSEs and unlimited Windows Server containers when all physical cores on the server are licensed.

Standard Edition provides rights to run up to two OSEs or two Hyper-V containers and unlimited Windows Server containers when all physical cores on the server are licensed.

With Windows Server 2019 Datacenter/Standard:

- Each physical server is required to be licensed for all physical cores
- Each physical processor is required to be licensed with a minimum of 8 physical cores
- Each physical server is required to be licensed with a minimum of two processors, totaling a minimum of 16 physical cores
- Core licenses are sold in packs of two (that is, a 2-pack Core License)

Essentials Edition remains on the processor-based licensing and covers servers with 2 CPUs.

To calculate the appropriate core licenses needed for your server, please visit:

<https://www.lenovosalesportal.com/windows-licensing-calculator.aspx>

4. **Q: What are CALs and do I need them?**

A: CALs (Client Access Licenses) are separately purchased licenses that allow Users or Devices to access resources on a licensed Windows Server OS environment.

Essentials Edition provides support for up to 25 Users; no additional CALs are needed.

Datacenter and Standard Edition include no CALs as part of the Base license. Customers must purchase User or Device CALs appropriate for their needs.

For more detailed information, please reference:

<https://www.microsoft.com/en-us/licensing/product-licensing/client-access-license>

5. **Q: What is a “Base license” versus an “Additional license”?**

A: The 16 core Datacenter and Standard edition Base licenses provide the minimum OS licensing basis for a physical server. Each server requires at least one Base license.

Additional core licenses must be purchased depending on the server’s processor configuration.

To calculate the appropriate core licenses needed for your server, please visit:

<https://www.lenovosalesportal.com/windows-licensing-calculator.aspx>

6. **Q: How are the MS OEM OS licenses delivered?**

A: Base licenses for Datacenter, Standard and Essentials include a Certificate of Authenticity (COA), product key (PK), product software (OS installation DVD), and the Microsoft Software License (formerly known as EULA). Lenovo or Lenovo Resellers will affix the base license COA label to the server chassis (exception being offerings for Windows Server Datacenter w/ Reassignment where the COA remains with the SW Shipgroup that contains the OS installation media).

Additional licenses for Datacenter and Standard include a Certificate of Authenticity (COA), and the Microsoft Software License (formerly known as EULA). The Additional license-COA label is contained affixed to a card in the shrinkwrapped SW Shipgroup (there is no product key included).

OS-CALs for Datacenter and Standard include a Certificate of Authenticity (COA), and the Microsoft Software License (formerly known as EULA). The CAL-COA label is contained affixed to a card in the shrinkwrapped SW Shipgroup (there is no product key included).

RDS-CALs for Datacenter and Standard include a Certificate of Authenticity (COA), product key (PK), and the Microsoft Software License (formerly known as EULA). The RDS-COA label is affixed to a card contained in the shrinkwrapped SW Shipgroup (there is a unique 5x5 product key printed on the RDS CAL label).

Extreme care must be taken to safekeep the provided COA labels (whether they are affixed to the server chassis or contained on the provided SW shipgroup) since there is no way to “reissue” or “replace” these COA labels.

7. **Q: Which licenses are available for purchase after point of sale (APOS)?**

A: Currently Microsoft limits the sale of OEM Base OS license offerings for Essentials, Standard and Datacenter editions to “at Point of Sale” (of the server hardware). However, additional licenses for Standard Edition are also available as “APOS” versions to facilitate customer’s changing need for HW upgrades or adding additional VMs.

Please refer to the product list found at the following page:
<http://dcsc.lenovo.com/#/software>

OS CALs and **RDS CALs** are available for purchase after point of sale.

8. **Q: What are my downgrade rights?**

A: Lenovo offers various “Downgrade” offerings at point of sale. Please refer to the product list found at <http://dcsc.lenovo.com/#/software>. If you are considering making use of your Downgrade rights, it is recommended to purchase these Downgrade kits at the same time as the server purchase.

For After Point of Sale Downgrade options, please reference this support page:
<https://support.lenovo.com/us/en/solutions/ht101582>

9. **Q: Are RDS CALs version specific?**

A: Yes, RDS CALs version must match that of the RDS Host Server’s OS.

For further information please see:
<https://docs.microsoft.com/en-us/windows-server/remote/remote-desktop-services/rds-client-access-license>

10. **Q: Are OS CALs version specific?**

A: CALs are only backwards version compatible, e.g. Windows Server 2019 CAL can be used to access Windows Server 2019 and previous versions.

For further information please see:
<https://www.microsoft.com/en-us/licensing/product-licensing/client-access-license>

11. **Q: Lenovo provided OS media will not install under VMware ESXi.**

A: When attempting to install Microsoft Windows Server using Lenovo-provided installation media into a virtualized computing environment created by VMware ESXi, the install may fail and an error message similar to this is shown:

"Please check with your computer manufacturer to resolve any issues you are having with this computer. These tools are built to only run on Lenovo computers. Since this system is not recognized as a valid system, the installation cannot continue."

Please reference the following solution:

<https://support.lenovo.com/us/en/solutions/HT506366>

12. **Q: Where is my Activation code?**

A: If your SW offering requires an activation code (see #6), then it is printed on a COA label similar to the one pictured here:



Most OEM **Base OS COAs** must be adhered to the server chassis, Depending on the server chassis, the COA label can be found on the top, or the side chassis (typically adjacent to agency labels):



However, due to space constraints, the COA may also be found on the bottom chassis:



Base OS license products "with reassignment" rights are an exception: its COA is attached to a card that is delivered alongside the server shipment.

Note that OEM COAs are "tied" to the hardware with which they were originally purchased with and cannot be transferred to another system unless Microsoft Software Assurance is added within 90 days of buying the server or when reassignment rights are specified within the product terms (e.g. included in "Windows Server 2019 and 2016 Datacenter w/Reassignment Rights" SKU).

CAL offerings do not include an activation code, their CAL-COA labels are proof of purchase only.

RDS CAL offerings do include an activation code on their RDS-COA label which is affixed to a card contained in the shrinkwrapped SW Shipgroup.

13. Q: Can I use my OEM activation code on an image installed with Evaluation or Retail OS images?

A: By Microsoft design, the 25-character activation code (a.k.a. “5x5”) that is printed on the Lenovo OS COA label is designed to only work with OS installations that were performed using the provided Lenovo installation media.

However, Microsoft has published an unsupported method for license conversion which is provided here for additional reference:

<https://docs.microsoft.com/en-us/windows-server/get-started/supported-upgrade-paths#converting-a-current-evaluation-version-to-a-current-retail-version>

Please note that Lenovo is not able to assist with such license conversion workarounds.

14. Q: The activation code on my COA label is damaged.

A: Should the 25-character activation code on the COA label become illegible please contact Lenovo Data Center support at <https://datacentersupport.lenovo.com/us/en/supportphonenumber> and reference the “Damaged COA Replacement Process”.

Note: This process requires a digital picture of the damaged COA to start the replacement process that Lenovo will engage in with Microsoft. Lenovo cannot “replace” or “reissue” COA labels that have been lost.

15. Q: I lost my OS installation media or my media is defective.

A: Lenovo offers replacement of the Lenovo branded OS installation media should it be lost or becomes defective. Please contact Lenovo Data Center Support at: <https://datacentersupport.lenovo.com/us/en/supportphonenumber>

16. Q: Can I reassign a Lenovo OEM Licenses in the case of new hardware or a disaster recovery scenario?

A: Lenovo does offer a Datacenter license that includes reassignment rights, which can be reassigned to a new server every 90 days; in the same manner as volume licensing. Lenovo also offers Datacenter and Standard OEM licenses which are more cost effective, and do not have reassignment rights. Should the customer purchase one of these licenses and require reassignment rights they would need to purchase Software Assurance from a Microsoft volume license reseller.

Note: Software Assurance must be purchased within 90 days of the OEM product and can only be applied to the most recent form of the OS.

SQL Server licensing

Lenovo offers SQL Server 2019 Standard Edition.

Lenovo offers the following types of licenses for SQL Server 2019:

- CTO (Configure To Order): OEM license that is added to the Lenovo server shipment at manufacturing and requires a Windows Server OS to be selected at the same time.
 - “Core based” (No SQL CALs required)
 - “Server + CAL based” (SQL CALs required)
- ROK (Reseller Option Kit): Sold by Lenovo’s authorized resellers and distributors. SQL Server 2017 & 2016 are offered as a bundled offering with a Windows Server OS such as Windows Server 2019 or Windows Server 2016.
 - Server Based (SQL CALs required)

Note: Both Windows CALs and SQL Server CALs need to be considered. Client Access Licenses (CALs) can be per-user or per-device.

Each user CAL permits one user, using any device, to access instances of the server software on their licensed servers. Each device CAL permits one device, used by any user, to access instances of the server software on their licensed servers.

The maximum compute capacity for SQL standard is 4 sockets / 24 physical or virtual cores and 128GB Memory for DB engines. As there is no restriction in DCSC or a warning given, people should be aware that more than 4 sockets or 24 cores may be unnecessary overkill and they may be overpriced.

For customers if the users / devices connecting to the database are large and unknown, Core base licenses should be suggested. For customers who with a known number of user/ devices Server + CAL is required. The CALs should be chosen based on the users/ devices connecting to database.

SQL Server 2019

This section provides information on SQL Server 2019 from Lenovo:

- [Features](#)
- [Feature codes for configure-to-order](#)
- [Part numbers for Reseller Option Kits](#)

Features

Learn more about SQL Server 2019 features on this page:

<http://hhttps://docs.microsoft.com/en-us/sql/sql-server/what-s-new-in-sql-server-ver15?view=sql-server-ver15>

SQL Server 2019 CTO Feature Codes

The following tables list the configure-to-order (CTO) feature codes to order SQL Server 2019.

Table 12. SQL Server 2019 CTO Feature Codes

Description	Feature code
MICROSOFT SQL SERVER 2019 STANDARD CTO (Core Licensing)	
Microsoft SQL Server 2019 Standard 4 core - Brazilian	S24S
Microsoft SQL Server 2019 Standard 4 core - ChnSimp	S24T
Microsoft SQL Server 2019 Standard 4 core - ChnTrad	S24U
Microsoft SQL Server 2019 Standard 4 core - English	S24V

Description	Feature code
Microsoft SQL Server 2019 Standard 4 core - French	S24W
Microsoft SQL Server 2019 Standard 4 core - German	S24X
Microsoft SQL Server 2019 Standard 4 core - Italian	S24Y
Microsoft SQL Server 2019 Standard 4 core - Japanese	S24Z
Microsoft SQL Server 2019 Standard 4 core - Korean	S250
Microsoft SQL Server 2019 Standard 4 core - Russian	S251
Microsoft SQL Server 2019 Standard 4 core - Spanish	S252
MICROSOFT SQL SERVER 2019 STANDARD CTO (Per Server Licensing)	
Microsoft SQL Server 2019 Standard-Brazilian	S24F
Microsoft SQL Server 2019 Standard-Chinese Simplified	S24G
Microsoft SQL Server 2019 Standard-Chinese Traditional	S24H
Microsoft SQL Server 2019 Standard-English	S24J
Microsoft SQL Server 2019 Standard-French	S24K
Microsoft SQL Server 2019 Standard-German	S24L
Microsoft SQL Server 2019 Standard-Italian	S24M
Microsoft SQL Server 2019 Standard-Japanese	S24N
Microsoft SQL Server 2019 Standard-Korean	S24P
Microsoft SQL Server 2019 Standard-Russian	S24Q
Microsoft SQL Server 2019 Standard-Spanish	S24R
MICROSOFT SQL SERVER 2019 Downgrade	
SQL Server Standard Edition 2019 Downgrade Kit - Brazilian	S25T
SQL Server Standard Edition 2019 Downgrade Kit - ChnSimp	S25U
SQL Server Standard Edition 2019 Downgrade Kit - ChnTrad	S25V
SQL Server Standard Edition 2019 Downgrade Kit - English	S25W
SQL Server Standard Edition 2019 Downgrade Kit - French	S25X
SQL Server Standard Edition 2019 Downgrade Kit - German	S25Y
SQL Server Standard Edition 2019 Downgrade Kit - Italian	S25Z
SQL Server Standard Edition 2019 Downgrade Kit - Japanese	S260
SQL Server Standard Edition 2019 Downgrade Kit - Korean	S261
SQL Server Standard Edition 2019 Downgrade Kit - Russian	S263
SQL Server Standard Edition 2019 Downgrade Kit - Spanish	S264
MICROSOFT SQL 2019 CLIENT ACCESS LICENSES CTO (CALs)	
Microsoft SQL Server 2019 CAL (1 Device)	S26H
Microsoft SQL Server 2019 CAL (1 User)	S26J
Microsoft SQL Server 2019 CAL (5 Device)	S26K
Microsoft SQL Server 2019 CAL (5 Device) - BR	S26L
Microsoft SQL Server 2019 CAL (5 User)	S26M
Microsoft SQL Server 2019 CAL (5 User) - BR	S26N
ADDITIONAL LICENSE CTO	
Microsoft SQL Server 2019 Standard Additional Server License	S25R
Microsoft SQL Server 2019 Standard 2 Core Additional License	S262

SQL Server 2019 ROK Part Numbers

The following tables list the Reseller Option Kit (ROK) part numbers to order SQL Server 2019.

POS (point of sale) refers to licenses sold at point of original purchase. These are stacked on base licenses when the number of cores or processors exceeds those covered by the base OS license.

Table 13. SQL Server 2019 ROK Part Numbers

Description	Part number
MICROSOFT SQL SERVER 2019 STANDARD WITH WINDOWS SERVER 2019 STANDARD ROK (16 core)	
MS SQL Server 2019 Std w/Windows Server 2019 Std ROK (16 core)-Brazilian	7S05003QWW
MS SQL Server 2019 Std w/Windows Server 2019 Std ROK (16 core)-ChnSimp	7S05003RWW
MS SQL Server 2019 Std w/Windows Server 2019 Std ROK (16 core)-ChnTrad	7S05003SWW
MS SQL Server 2019 Std w/Windows Server 2019 Std ROK (16 core)-English	7S05003TWW
MS SQL Server 2019 Std w/Windows Server 2019 Std ROK (16 core)-French	7S05003UWW
MS SQL Server 2019 Std w/Windows Server 2019 Std ROK (16 core)-German	7S05003VWW
MS SQL Server 2019 Std w/Windows Server 2019 Std ROK (16 core)-Italian	7S05003WWW
MS SQL Server 2019 Std w/Windows Server 2019 Std ROK (16 core)-Japanese	7S05003XWW
MS SQL Server 2019 Std w/Windows Server 2019 Std ROK (16 core)-Korean	7S05003YWW
MS SQL Server 2019 Std w/Windows Server 2019 Std ROK (16 core)-Russian	7S05003ZWW
MS SQL Server 2019 Std w/Windows Server 2019 Std ROK (16 core)-Spanish	7S050040WW
MICROSOFT SQL SERVER 2019 STANDARD WITH WINDOWS SERVER 2019 DATACENTER ROK (16 core)	
MS SQL Server 2019 Std w/Windows Server 2019 Dtc ROK (16 core)-Brazilian	7S050041WW
MS SQL Server 2019 Std w/Windows Server 2019 Dtc ROK (16 core)-ChnSimp	7S050042WW
MS SQL Server 2019 Std w/Windows Server 2019 Dtc ROK (16 core)-ChnTrad	7S050043WW
MS SQL Server 2019 Std w/Windows Server 2019 Dtc ROK (16 core)-English	7S050044WW
MS SQL Server 2019 Std w/Windows Server 2019 Dtc ROK (16 core)-French	7S050045WW
MS SQL Server 2019 Std w/Windows Server 2019 Dtc ROK (16 core)-German	7S050046WW
MS SQL Server 2019 Std w/Windows Server 2019 Dtc ROK (16 core)-Italian	7S050047WW
MS SQL Server 2019 Std w/Windows Server 2019 Dtc ROK (16 core)-Japanese	7S050048WW
MS SQL Server 2019 Std w/Windows Server 2019 Dtc ROK (16 core)-Korean	7S050049WW
MS SQL Server 2019 Std w/Windows Server 2019 Dtc ROK (16 core)-Russian	7S05004AWW
MS SQL Server 2019 Std w/Windows Server 2019 Dtc ROK (16 core)-Spanish	7S05004BWW
WINDOWS SERVER 2019 CLIENT ACCESS LICENSES ROK (CALs)	
Microsoft SQL Server 2019 CAL (1 Device)	7S05004QWW
Microsoft SQL Server 2019 CAL (1 User)	7S05004RWW
Microsoft SQL Server 2019 CAL (5 Device)	7S05004SWW
Microsoft SQL Server 2019 CAL (5 Device) - BR	7S05004TWW
Microsoft SQL Server 2019 CAL (5 User)	7S05004UWW
Microsoft SQL Server 2019 CAL (5 User) - BR	7S05004VWW
ADDITIONAL LICENSE ROK	
MS SQL Server 2019 Standard Addl Svr Lic (Reseller POS Only)	7S05004PWW

Lenovo Compatibility

The Lenovo Server Operating System Interoperability Guide (OSIG) is a comprehensive source of information about operating system compatibility with Lenovo servers. It includes servers in the ThinkSystem, ThinkAgile, System x, ThinkServer, NeXtScale, Flex System and BladeCenter product families and covers servers that are currently supported by Lenovo under warranty.

For more information, please visit the OSIG page: <http://lenovopress.com/osig>. **Use the dropdown menus to filter and finetune your search.** In each of the search results, the support statement column contains clickable links that opens a popup window with details about the support.

For Lenovo option compatibility, the Lenovo ServerProven® program validates selected products for compatibility with all Lenovo ThinkSystem servers. Through the ServerProven Program, Lenovo works with industry leaders to test their equipment with Lenovo products.

For compatibility information, please visit: <http://static.lenovo.com/us/en/serverproven/index.shtml>. For more details, please click on the Lenovo product. For compatibility with OS, please click on the green + button to expand the section.

XClarity Integrator

Lenovo XClarity Integrator enables XClarity Administrator to integrate into your existing IT applications, providing the functionality you need to manage Lenovo infrastructure right in the console of the software tools that you already use. XClarity Administrator is a centralized resource management solution that reduces complexity, speeds response, and enhances the availability of Lenovo ThinkSystem infrastructure and ThinkAgile solutions.

For more information on XClarity Administrator, visit:
<https://lenovopress.com/tips1200-lenovo-xclarity-administrator>

XClarity Integrator for Microsoft System Center

Lenovo XClarity Integrator for Microsoft System Center expands Microsoft System Center server management capabilities by integrating Lenovo hardware management functionality, providing affordable, basic management of physical and virtual environments to reduce the time and effort required for routine system administration.

Lenovo XClarity Integrator integrates with the following Microsoft System Center tools:

- Microsoft System Center Configuration Manager
- Microsoft System Center Operations Manager
- Microsoft System Center Virtual Machine Manager

Download XClarity Integrator for Microsoft System Center from:
<https://support.lenovo.com/us/en/solutions/Invo-msuim>

XClarity Integrator for Windows Admin Center

Lenovo XClarity Integrator for Windows Admin allows you to manage your Lenovo infrastructure from the console of Windows Admin Center. Windows Admin Center is a locally deployed, browser-based app for managing servers, clusters, hyper-converged infrastructure, and Windows 10 PCs.

The Windows Admin Center is a free download separate from Windows Server 2019, available from Microsoft:

<https://docs.microsoft.com/en-us/windows-server/manage/windows-admin-center/understand/windows-admin-center>

Download XClarity Integrator for Windows Admin Center from:
<https://support.lenovo.com/us/en/solutions/HT507549>

XClarity Integrator for Microsoft Azure Analytics

Lenovo XClarity Integrator for Microsoft Azure Log Analytics lets you analyze events from Lenovo XClarity Administrator and the devices that it manages. These insights can help systems administrators find potential problems in their environment.

Download XClarity Integrator for Microsoft Azure Analytics from:
<https://support.lenovo.com/us/en/solutions/ht506712>

Support from Lenovo

Lenovo's Enterprise Server Software Support service provides comprehensive, single-source support for a wide range of server operating systems and Microsoft server applications. Lenovo provides 24x7x365 service for critical problems, and support during business hours for noncritical problems. If live phone help is unavailable during those service windows, responses are provided within 2 hours.

For more information, see the following web page:
<https://support.lenovo.com/us/en/solutions/ht504357>

Microsoft Solutions from Lenovo

Lenovo offers a broad range of Microsoft based solutions in varying levels of integration to meet different customer requirements and business needs. Solutions range from the turnkey factory-integrated, pre-configured ready-to-go Lenovo ThinkAgile SX series of appliances to build-your-own Engineered Solutions based on Lenovo's proven reference architecture and everything in between.

ThinkAgile MX Certified Nodes

Storage Spaces Direct is a feature of Windows Server 2016 and 2019 Datacenter Editions, provided at no extra cost and can be used to build a Hyper-Converged Storage solution. It also supports "Disaggregated Mode", with no available VM's, to create a Software Defined Storage environment.

Storage Spaces Direct is software defined storage, using pre-validated Lenovo server configurations with local-attached drives to create software-defined storage at a fraction of the cost of traditional SAN or NAS arrays. Its converged or hyper-converged architecture radically simplifies procurement and deployment, while features such as caching, storage tiers, and erasure coding, together with the latest hardware innovations such as RDMA networking and NVMe drives, deliver unrivaled efficiency and performance.

Storage Spaces Direct is included in 2019 Datacenter Editions.

ThinkAgile MX Certified nodes combine the Microsoft Storage Spaces Direct technology included in Windows Server 2019 Datacenter with industry leading Lenovo servers to give HCI building blocks to build your infrastructure solutions. ThinkAgile MX Certified Nodes are designed for deploying highly available, highly scalable hyper-converged infrastructure (HCI) and software-defined storage (SDS) from Microsoft on Lenovo enterprise platforms.

ThinkAgile MX Certified Nodes are built on industry-leading Lenovo ThinkSystem servers that feature enterprise-class reliability, management, and security. The ThinkAgile MX Certified Nodes offer ThinkAgile Advantage Single Point of Support for quick 24/7 problem reporting and resolution. The ThinkAgile MX Certified Nodes can be optimized for various types of workloads, including general purpose workloads for small and medium businesses, virtual desktop infrastructure (VDI), server virtualization, enterprise applications, databases, and data analytics.

Related links:

- [ThinkAgile MX Product page](#)
- [ThinkAgile MX Product Guide](#)
- [ThinkAgile MX Datasheet](#)
- [ThinkAgile MX 3D Tour](#)

ThinkAgile SX for Microsoft Azure Stack

Lenovo ThinkAgile SX for Microsoft Azure Stack is a turnkey, rack-scale solution optimized with a resilient, high-performing, and secure software-defined infrastructure. Lenovo and Microsoft worked together to engineer the solution components—the Azure Stack software and Lenovo software-defined infrastructure—to make sure they perform seamlessly. ThinkAgile SX for Microsoft Azure Stack is a preintegrated, engineered solution that comes direct from Lenovo—ready to go—with all features, support, and deployment services included.

With benefits like IT agility, lower TCO, and a transformative customer experience, ThinkAgile SX for Microsoft Azure Stack provides the ease and speed of a public cloud with the security and control of on-premises IT. There is no need to worry about configuring and tweaking settings for virtual or physical infrastructure. Your IT personnel can now focus more on building proficiencies in deploying and operating cloud services—such as IaaS, PaaS, and SaaS—and less on your infrastructure.

ThinkAgile SX for Microsoft Azure Stack is the perfect platform to:

- Deliver Azure cloud services from the security of your own data center
- Enable rapid development and iteration of applications with on-premises deployment tools to help transform your organization
- Unify application development across your entire hybrid cloud environment
- Easily move applications and data across private and public clouds

Related links:

- [ThinkAgile SX for Microsoft Azure Stack Product Page](#)
- [ThinkAgile SX for Microsoft Azure Stack \(SXM4200, SXM6200\) Product Guide](#)
- [ThinkAgile SX for Microsoft Azure Stack Datasheet](#)
- [Introducing the Microsoft Azure Stack Development Kit on Lenovo Servers](#)
- [ThinkAgile SX for Microsoft Azure Stack 3D Tour](#)

Engineered Solutions

Lenovo Database Solutions for Microsoft SQL Server bring together the right mix of technology and software to align with a range of data warehouse and transactional database use cases. The configurations integrate a variety of Lenovo Systems and appliances, robust Lenovo Storage options and the capabilities of Microsoft SQL Server 2019 Enterprise and Standard Editions to provide the following benefits:

- Improved time to value with pretested hardware configurations
- Optimized SQL server deployment with a significant reduction in hardware testing and tuning
- Reduced total cost of ownership through better price and performance, rapid deployment, and advanced hardware
- Consolidated storage and matched IT investment-to-information-value with several high performance storage options

Lenovo ThinkSystem based Microsoft OLAP Database Solutions:

- [Lenovo Database Performance Benchmarks](#)
- [Lenovo Database Solution for Microsoft SQL Server](#)
- [Lenovo Database Solution for Microsoft SQL Server RA](#)
- [Lenovo Database Configuration for Microsoft SQL DWFT – 10 TB](#)
- [Lenovo Database Configuration for Microsoft SQL DWFT – 50 TB with Intel DCPMM](#)
- [Lenovo Database Configuration for Microsoft SQL DWFT – 50 TB](#)
- [Lenovo Database Configuration for Microsoft SQL DWFT – 65 TB HA](#)
- [Lenovo Database Configuration for Microsoft SQL DWFT – 200 TB](#)

Intel Select Solutions—Lenovo Database Configurations for Microsoft SQL Server OLTP:

Through the Intel Select Solution program, Lenovo offers a growing portfolio of high availability Microsoft SQL Server OLTP solutions featuring the robust ThinkSystem SR630 and SR650 servers. These transactional database offerings combine high-performance and cost effective server platforms with Microsoft SQL Server software.

- [Lenovo Database Configurations for Microsoft SQL Server 2016 OLTP](#)
- [Lenovo Database Configuration for Microsoft SQL Server 2017 OLTP](#)

Lenovo Database Configuration for Microsoft SQL Server OLTP on ThinkSystem Servers:

- [Lenovo Database Configuration for Microsoft SQL Server Enterprise OLTP on SR650](#)
- [Lenovo Database Configuration for Microsoft SQL Server Standard OLTP on SR650](#)
- [Lenovo Database Configuration for Microsoft SQL Server Standard OLTP on SR650 w RHEL](#)
- [Lenovo Database Configuration for Microsoft SQL Server OLTP on SR950](#)

Lenovo Database Validated Design for Microsoft SQL Server OLTP on VMware vSAN:

- [Lenovo Database Validated Design for Microsoft OLTP with VMware vSAN](#)
- [Lenovo Database Validated Design for Microsoft OLTP with VMware vSAN](#)

Lenovo Database Validated Design for Microsoft SQL Server OLTP on ThinkAgile

- [Workloads using Lenovo ThinkAgile HX Series](#)

Lenovo Database Validated Design for Microsoft SQL Server OLTP on ThinkAgile SXM:

- [Lenovo Database Reference Architecture for Microsoft SQL OLTP on ThinkAgile SXM](#)

Additional resources

These web pages provide additional information:

- [Microsoft OS Support Center](#)
- [Microsoft Windows Server Catalog](#)

Related product families

Product families related to this document are the following:

- [Microsoft Alliance](#)
- [Microsoft Windows](#)

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

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