

Microsoft Key Management Service (KMS) Volume Activation FAQs

<https://woshub.com/ms-kms-activation-faq/>

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This article describes how KMS technology works and how you can use it to activate Microsoft volume licensing products. The Microsoft Volume Licensing program allows enterprise customers to deploy an internal **Key Management Service (KMS)** host on the network where all client devices are activated. To activate Windows, Office, Project, or Visio, your computers don't have to contact Microsoft's online activation servers. In this case, client activation takes place entirely within your local network.

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Understanding KMS Volume Activation Architecture

KMS infrastructure consists of a **KMS server** which is activated by Microsoft (this needs to be done once, either online or by phone), and **KMS clients**, that send activation requests to the KMS server. Windows workstations, hosts running Windows Server, and computers that have Microsoft Office 2021/2019/2016/2013 volume version installed can act as KMS Server clients.

The KMS server itself is activated using a special corporate **CSVLK key (KMS host key)**, which can be obtained by any Microsoft corporate customer in their personal account on the Microsoft Volume Licensing site (VLSC) -<https://www.microsoft.com/Licensing/servicecenter/default.aspx>

Sign in and go to the **Microsoft Volume Licensing Service Center -> License -> Relationship Summary -> Product Keys**. Copy your KMS host key for **Windows Srv 2019 DataCtr/Std KMS** (for example).

Currently, the KMS host key is not listed in the VLSC by default. Microsoft will generate a KMS host key for you if you contact technical support.

You must specify the CSVLK key on the KMS host and then activate your KMS server over the Internet on Microsoft servers. KMS Server activation only needs to be done once.

[getting KMS host key from Microsoft Volume Licensing Service Center](#)

A single KMS server can activate an unlimited number of KMS clients. For example, although your Microsoft agreement states that you have purchased volume licenses for 100 desktop computers, you could theoretically activate thousands of copies of Windows. Of course, this is a violation of the Microsoft license agreement, but technically the KMS server doesn't limit the number of activations. Also, note that information about the number of volume activations performed is not sent outside the organization by the KMS host.

[Microsoft KMS Activation Service architecture](#)

KMS server can activate clients in different domains, as well as clients in workgroups. One KMS server can simultaneously activate both desktop editions of Windows and Windows as well as products from the Microsoft Office suite.

During the installation of a KMS server, you can automatically register a special **SRV (_VLMCS)** record in the DNS. Any client can find the name of the KMS server in the domain using this DNS record. For example, to manually find the KMS server name in your *corp.woshub.com* domain, run the command:

```
nslookup -type=srv _vlmcs._tcp.corp.woshub.com
```

```
_vlmcs._tcp.corp.woshub.com SRV service location:  
priority      = 0  
weight        = 0  
port          = 1688  
svr hostname  = ny-kms01.corp.woshub.com  
ny-kms01.corp.woshub.com internet address = 10.0.1.100
```

Discovering KMS host via DNS

In this example, you can see that the KMS service is deployed on the *ny-kms01* server and is listening on TCP port 1688.

In order for the KMS server to activate the client, the client (Windows or Office) must have a special KMS public key installed. It is called a **GVLK** (Generic Volume License) key. After you have specified the GVLK key on the client device, the KMS client tries to find an SRV record in DNS pointing to the KMS host and tries to activate against it.

A complete list of the GVLK keys for all supported versions of Windows can be found on the Microsoft website at the following link <https://learn.microsoft.com/en-us/windows-server/get-started/kms-client-activation-keys>

Generic Volume License Keys (GVLK) for KMS client activation

These GVLK keys also allow you to [upgrade an evaluation copy of Windows Server](#) to a full Standard/Enterprise edition.

A KMS Server activated with a newer KMS Host Key can activate all previous versions of Windows, but not vice versa. For example, a KMS server activated with a *Windows Srv 2016 DataCtr/Std KMS* key won't be able to activate Windows 11 or Windows Server 2022/2019 computers. To support modern versions of Windows, you will need to obtain a new CSVLK key and activate it on your KMS server.

Tip. Microsoft allows you to use a special KMS extension called **Active Directory-Based Activation (ADBA)** for an AD domain network. ADBA enables you to automatically activate Office, Windows, or Windows Server [computers joined to an Active Directory domain](#). In this case, there is no dedicated KMS host on the network, but you will not be able to activate devices outside the domain or in another forest.

How to Install Volume Activation Key Management Server on

Windows Server?

A Windows Server host is required to deploy a KMS service (you can combine the KMS role with other roles).

As the KMS service is not a resource-intensive service, this role can be installed on any host. KMS doesn't need to be highly available. If the KMS server is unavailable for several hours (or even days), this downtime will have no impact on business operations.

1. Install the **Volume Activation Services** role through the Server Manager console or using the PowerShell: `Install-WindowsFeature -Name VolumeActivation -IncludeAllSubFeature -Include ManagementTool`
2. Then open a command prompt and install the company CSVLK key. Activate your KMS server on Microsoft:
`slmgr /ipk <kms_host_key_Windows_Server_2019>`
`slmgr /ato`
In order to perform the KMS server activation (performed only once), Microsoft websites must be accessible from the KMS server on ports 80/443. The KMS server can be activated by phone in an isolated (disconnected) environment (you can find the Microsoft support phone number for your country in the *phone.inf* file: `get-content C:\windows\System32\sppui\phone.inf`).
[get microsoft activation phone numbers worldwide](#)
3. Clients connect to the KMS server using the TCP/1688 port by default. Using PowerShell, [enable the Windows Defender firewall rule](#) to open this port: `Enable-NetFirewallRule -Name SPSPVC-In-TCP`
4. To publish a KMS server's SRV record in DNS, run:
`slmgr /sdns`
5. Check that your KMS host is activated:
`slmgr.vbs /dlv`
The command should return something like: **Description** = `VOLUME_KMS_WS22 channel`, **License status** = `Licensed`.

Find out more about [how to install and configure a KMS server in Windows Server 2022/2019](#).

How to Activate Windows with KMS Server?

Use the built-in VBS script `%WinDir%\System32\slmgr.vbs` to manually manage KMS activation on Windows computers. Run the script `slmgr.vbs` without any parameters to see all the options that are available.

slmgr.vbs script, show available activation options

If you want to manually activate a Windows workstation or a Windows Server host on a KMS server, follow the steps below.

1. Set the GVLK key depending on your Windows version and edition (Aa complete list of the public GVLK keys can be found on the Microsoft web site at the link above). For example, for Windows 10 or 11:

```
slmgr /ipk W269N-WFGWX-YVC9B-4J6C9-T83GX
```

2. If KMS auto-discovery is not configured in the domain (by SRV record), you can manually specify the KMS server address and port:

```
slmgr /skms kms-srv.woshub.com:1688
```

3. Activate your copy of Windows on the KMS server:

```
slmgr /ato
```

You should see the following message:

```
Activating Windows(R), EnterpriseS edition (xxxxxxxxxxxxxxxxxxxxxx) ...  
Product activated successfully.
```

4. [Check the Windows activation status:](#)

```
slmgr /dlv
```

If Windows has been successfully activated on KMS, this should be displayed:

```
VOLUME_KMSCLIENT channel  
License status: Licensed
```

slmgr/dlv check windows activation

Not that you can activate Microsoft volume license products using KMS Server if the following minimum number of KMS clients (**activation threshold**) requirements are met:

- Windows Desktop OSs: 25
- Windows Server OSs: 5
- MS Office: 5

When the number of activation requests from clients exceeds the activation threshold, the KMS server begins to activate licenses. You can get the current number of KMS clients using the command:

```
slmgr.vbs /dlv
```

KMS client current count and activation threshold

The Current Count value does not increase after reaching 50.

Tip. If necessary, the activation counter on the KMS server [can be increased using a script](#).

Computers that have been activated on the KMS server will need to connect to the KMS server at least once every 180 days to renew their activation. If the computer has not been connected for more than 180 days, your copy of Windows enters evaluation mode (grace period). By default, KMS client computers attempt to renew their activation every seven days.

If you need to activate devices that aren't connected to the corporate network with a KMS server at least once every 180 days, we recommend using the MAK (Multiple Activation) keys.

Activating Microsoft Office Volume License with KMS Server

Activation of MS Office products on a KMS server requires the installation of a special extension, **Microsoft Office Volume License Pack**. Depending on your version of MS Office, you must download and install the appropriate version of volumelicensepack.

- Microsoft Office 2016 Volume License Pack
- Microsoft Office 2019 Volume License Pack
- Microsoft Office LTSC 2021 Volume License Pack

[Microsoft Office Volume License Pack](#)

After installing the License Pack for MS Office on the KMS server, you need to install your personal Office CSVLK key and activate it.

Another VBS script (**ospp.vbs**) is used to manage the activation of Microsoft Office on clients. Open the Office installation directory to find it. For Office 2019, the ospp.vbs file is located by default in the `\Program Files\Microsoft Office\Office16` directory.

To manually specify the address of the KMS server on the Office client:

```
cscript ospp.vbs /sethst:kms-srv.woshub.com
```

Change the destination KMS server port:

```
cscript ospp.vbs /setprt:1688
```

Activate your volume-licensed MS Office version against a KMS server:

```
cscript ospp.vbs /act
```

Use the following command to check the current [activation status of Office 2019/2016/365](#):

```
cscript ospp.vbs /dstatusall
```

Learn more about [Microsoft Office KMS activation](#).

VAMT: Volume Activation Management Tool

To manage KMS servers and keys, and to obtain activation statistics, you can install the Volume Activation Management Tool (VAMT) utility.

- VAMT is not shipped as part of the operating system; it is included in the Windows Assessment and Deployment Kit (ADK) and is installed separately;
- .NET Framework is required to run VAMT;
- VAMT uses SQL Server Express database;
- The latest version of VAMT (3.1) supports all Microsoft operating systems, including Windows 10/11 and Windows Server 2019/2022.

KMS Activation Known Issues

- A common mistake is to install a corporate KMS key (CSVLK key) on clients instead of a public **GVLK** key;
- The GVLK key you are using does not match the operating system version on an activated machine;
- To support the activation of the latest versions of Microsoft products, the KMS server must be updated;
- If you get a **0xC004F074** error when trying to activate, this may be due to a missing SRV record `_VLMCS._tcp.woshub.com` in DNS. It can be created by the DNS admin or the KMS server address can be specified on the client manually;
- Error **0xC004F038** means that there are not enough clients on your network to activate (see *activation threshold* information above). The KMS server will begin activating clients as soon as it receives the minimum number of activation requests;
- Use the [Test-NetConnection cmdlet](#) to check the availability of port **TCP/1688** on the KMS server: `TNC par-kms -Port 1688 -InformationLevel Quiet`. If the port is unavailable, a firewall may be blocking access or the KMS server's Software Protection Service (`sppsvc`) is not running;
- If you want more information about a specific Windows activation error, you can use the command: `slui.exe 0x2a ErrorCode`.

