

## 2.1. Activation

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Windows activation is the process of verifying that an installation of Windows is properly licensed. Activation is an anti-piracy measure that ensures that product keys are valid and prevents installation of the software on more than one machine. You should know the following about Windows activation:

- For most products, a valid license key must be provided during installation before the installation can proceed.
- Activation is a separate process that occurs, typically immediately after installation, where the license key is validated with Microsoft.
- Activation can be done automatically through the Internet, or manually by telephone.
- Activation is based on the license key and hardware components. If you add or upgrade hardware components in the same system, you might be prompted to reactivate Windows.
- Volume licensing eliminates the need for multiple product keys and can simplify the activation process for multiple computers. Windows Server uses two volume licensing methods:
  - Multiple Activation Key (MAK) uses a single license key for multiple computers. Each computer activates with Microsoft using the same key.
  - Key Management Services (KMS) uses a license server (called a host) to provide licenses and to activate Windows. Clients activate with the KMS server, and the KMS server validates licenses with Microsoft.
- OEM licenses are used for computers that come with Windows preinstalled. OEM licenses are typically restricted to a single installation on the original hardware, and might not qualify for upgrade pricing.

The activation status of the system will be one of the following states:

State	Description
Activated	A system that has been activated has validated the license key and hardware with Microsoft. An activated system can use the full functionality of the operating system.

<p><b>Grace</b></p>	<p>A system is in the grace period when Windows has been installed but not yet activated.</p> <ul style="list-style-type: none"> <li>• The length of the grace period depends on the operating system (30 days for Workstation, 60 days for Server).</li> <li>• During the grace period, all features of the operating system are available.</li> <li>• Periodic notifications are sent prompting you to activate the copy of Windows.</li> </ul>
<p><b>Genuine</b></p>	<p>The Genuine condition is not an activation state, but instead is a service used by some features to determine whether or not they should run.</p> <ul style="list-style-type: none"> <li>• When you attempt to use a Genuine Only feature, the computer checks its validation state.</li> <li>• The computer must be validated with the Windows Genuine Advantage (WGA) service before a Genuine Only feature will run.</li> <li>• The computer must be activated before it can be validated.</li> <li>• If the computer fails validation, Genuine Only features will not work.</li> <li>• Validation is only performed on Workstation, not on Server.</li> </ul>
<p><b>Notification</b></p>	<p>The notification state occurs when the grace period ends. In the notification state:</p> <ul style="list-style-type: none"> <li>• The desktop background is set to black.</li> <li>• During interactive logon, a notice is shown indicating that Windows has not been activated. This dialog can delay logon for up to 2 minutes.</li> <li>• Every hour, a task bar notification is shown and the background is reset to black if it has been changed.</li> </ul>

	<ul style="list-style-type: none"> <li>Most operating system features remain available except for KMS activation, Genuine Only features, and system updates other than critical updates.</li> </ul>
<b>Reduced Functionality Mode (RFM)</b>	<p>Systems prior to Windows Workstations enter RFM mode when the grace period expires. In RFM:</p> <ul style="list-style-type: none"> <li>User logons are restricted to one-hour sessions.</li> <li>The Start Menu, Task Manager, remote desktop, printing services, and Genuine Only features are unavailable.</li> <li>A restart into Safe Mode might be required to back up user data.</li> </ul>

Use the following tools to manage licensing and activation on a Windows Server system.

<b>Tool</b>	<b>Description</b>
<b>Windows Activation Wizard</b>	Run the Windows Activation Wizard to add or change a product key and to perform activation. Start the wizard from the System applet in the Control Panel, or by running <b>Slui.exe</b> from a command prompt.
<b>Windows Software Licensing Management Tool (Slmgr.vbs)</b>	<p>The Windows Software Licensing Management Tool is a Visual Basic script that allows you to manage software licensing. Use the following switches with Slmgr.vbs:</p> <ul style="list-style-type: none"> <li>Run <b>Slmgr /?</b> to see a list of available options.</li> <li>Run <b>Slmgr -dli</b> to display licensing and activation information.</li> <li>Run <b>Slmgr -ipk</b> to add a license key.</li> <li>Run <b>Slmgr -ato</b> to activate Windows.</li> </ul>

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## 2.1. Volume Licensing

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Microsoft has two methods for performing volume licensing:

Method	Description
<b>Multiple Activation Key (MAK)</b>	<p>With MAK, each computer activates with Microsoft to obtain a permanent activation key. Multiple computers activate using the same license key, up to the total number of computers allowed by the key. Computers can activate using one of two methods:</p> <ul style="list-style-type: none"><li>• With MAK independent activation, each client computer contacts Microsoft directly to perform activation (either through the Internet or by phone).</li><li>• With MAK proxy activation, a computer running the Volume Activation Management Tool (VAMT) gathers installation IDs (IIDs) from client computers, sends the IIDs to Microsoft, obtains a confirmation ID (CID) from Microsoft, and returns the CID to the client.</li></ul>
<b>Key Management Services (KMS)</b>	<p>With KMS, a central licensing server, called the KMS <i>host</i>, manages licensing and activation for clients.</p> <ul style="list-style-type: none"><li>• Clients connect to the KMS host that you configure on your network for activation.</li><li>• The KMS host is the only computer that communicates with Microsoft. It only connects to Microsoft once when setting up the KMS host; it does not connect to Microsoft each time a client must be activated.</li><li>• Clients must re-activate with the KMS host every 180 days. Clients attempt to re-activate every 7 days.</li></ul>

The main differences between MAK and KMS are:

- KMS uses a server on your network as an activation server; MAK clients activate with Microsoft, either directly or through a proxy server.

- Once activated, MAK clients remain activated; KMS clients must re-activate with the KMS host at least every 180 days. You can only use KMS if clients can periodically reconnect to your KMS host for reactivation.
- KMS can only be used in larger deployments that meet the activation threshold (the total number of computers to be activated). The activation threshold is with at least 5 Windows Server 2008 and later servers or 25 Windows Vista or later clients. Use MAK if you have a small number of hosts to activate.

Using MAK requires little configuration. With MAK independent activation, you use a single product key for multiple computers, such as during installation, and then manually activate each computer following installation. When using VAMT to manage licensing, be aware of the following:

- Use VAMT to add MAK and KMS license keys. When using MAK, the MAK key can be sent to clients instead of entering the key individually on each client.
- Once the MAK key is installed, you can instruct client computers to activate with Microsoft, or to perform proxy activation.
- VAMT uses WMI to query client computers. Enable the Windows Management Instrumentation (WMI) firewall exception (port 1688) on all computer and network firewalls to allow VAMT to communicate with clients.
- VAMT can find computers by name or IP address, by searching Active Directory computer accounts, or by searching workgroup computers.
- VAMT must be able to log on to client computers using credentials that provide local Administrator rights.

When using KMS, be aware of the following configuration considerations:

- The KMS host can run Windows Vista/7/8/10, Server 2003/2008/2012/2016.
  - On Windows Server 2003, download and install KMS.
  - KMS is included with Windows Server 2008 or later. Add KMS as a feature to configure the server as a KMS host.

You can have multiple KMS hosts on your network. Additional hosts are recommended (but not required) only if you have more than 100 KMS clients.

- Only physical computers count towards the activation threshold. Once the threshold has been reached, virtual machines can be activated using KMS. Neither the KMS host nor clients activated using MAK count towards the threshold.
- After adding KMS to the host computer, install the KMS license on the host and activate with Microsoft. You can activate the host through the Internet or by phone.
- By default, computers that have a volume licensing version of Windows are configured as KMS clients. The client uses DNS to dynamically locate the KMS host.
  - SRV records in DNS identify the KMS hosts on your network. The record name is **\_vlmcs.\_TCP.dnsdomainname** and should be created automatically (if dynamic DNS is enabled on the zone).
  - To configure a client to use a specific KMS host, run the **Slmgr -skms** command followed by the KMS host name, or use VAMT to identify the KMS host to use for a specific host.