

Dell™ OEM Windows® Server® 2008

Installation on Virtual Machines using Dell OEM Media

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SECTION 1

EXECUTIVE SUMMARY

Your Dell™ system is shipped with the Windows® Server® 2008 operating system. To reinstall the operating system using the Dell OEM media, you do not need to enter the product key. After the operating system installation is complete, the copy of the operating system on your Dell system is automatically activated.

However, you cannot automatically pre-activate the Windows Server 2008 operating system installed on virtual machines by using the Dell OEM installation media. There has been a change to the product activation process by Microsoft. Based on this change, the activation code present in the Dell OEM media is no longer useful for guest operating system activation. Instead, you need to use a *virtual product key* to activate the guest operating system.

This article describes the steps required to activate guest operating systems installed with Dell OEM media on virtual machines. The article also discusses the necessary steps to create a pre-activated master virtual machine image. The master virtual image can be deployed in different virtual environments or on separate virtual machines in the same hypervisor environment.

The article does not discuss KMS activation, virtualization, sysprep features and unattended installation process in details.

Note: Throughout this article, the term *guest operating system* refers to the Windows Server 2008 operating system installed on the virtual machine or the "child partition".

SECTION 2

INTRODUCTION

Product Key and Virtual Key

The *product key* is a 25-character string with each of the 5 characters separated by "-". The product key is optional during the operating system setup process but it is required during the activation process.

The Windows® Server® 2003 operating system is delivered with only one product key. The same product key can be used to activate the operating system deployed on the physical systems as well as the guest operating system deployed on the virtual machines.

However, for Dell™ systems running Windows Server 2008 operating system, you receive two product keys. The product keys in the Windows Server 2008 operating system are called the *product key* and the *virtual key* respectively. These product keys are printed on the COA sticker.

The product key is used to activate the operating system that is running on the physical system. If you purchased the operating system from Dell as a preinstalled operating system, then as already mentioned before, it is not necessary to use this key during the operating system reinstallation.

The virtual key is used to activate the guest operating system installed on virtual machines on any hypervisor. This virtual key lets you activate multiple instances of the Windows Server 2008 guest operating system.

For detailed license terms related to guest operating system instances, refer to the Microsoft knowledge base article located on the Microsoft Support website at support.microsoft.com/kb/949748.

SECTION 3

MASTER INSTANCE SETUP AND ACTIVATION

If the setup process for the guest operating system is initiated from the Dell™ provided operating system media, then the setup process does not display the product key entry screen. The setup process automatically uses the pre-activation code present in the Dell media and successfully completes the installation process. There is no technical way to pre-activate this installed guest operating system. You need to activate the guest operating system by contacting the Microsoft activation servers through the internet or by contacting the Microsoft activation representative by using the telephone.

This activation process involves two steps:

1. Substitute the product key with the virtual key.
2. Contact Microsoft through the internet or telephone for activating the guest operating system.

Identifying the Virtual Key

For all the Dell systems shipped with the Windows® Server® 2008 operating system pre-installed, the pre-installation virtual key along with the product key is printed on the COA label. Refer to figure below for a sample COA image with the product key printed on it. The COA label is pasted on the chassis of the system.



Replacing the Existing Product Key with the Virtual Key

During the guest operating system installation process, the Dell operating system media installs a generic product key that is not valid for activating virtual machines. Replace the generic product key with the virtual key identified in the previous section.

Note: All commands used in the command line section can also be used in the Windows Server 2008 Server Core environment.

You can install the virtual key by using either the command line or the GUI mode. Perform the following steps to display the window where you can install the virtual key:

Command line:

1. Start the command prompt window with administrative privileges.
2. Run the command: `slmgr.vbs /ipk <Virtual Key>`
For example: `slmgr.vbs /ipk XYZ12-PQRS1-ABCDE-12345-VWXYZ`

GUI Mode:

1. Open the **System Properties** window using **Start** → **Control Panel** → **System**.
2. Click on the **Change Product Key** link in the **Windows Activation** section.

The product key entry screen is displayed. Enter the virtual key you had already identified in the product key entry screen. Once the virtual key is entered it automatically tries to activate Windows. Windows may not be able to activate as the guest operating system may not be configured to contact the Microsoft activation server via the internet.

Confirming the Product Key Installation

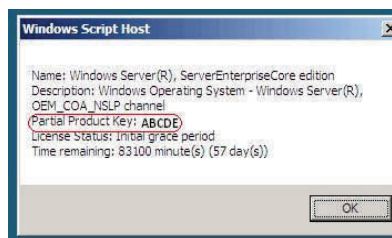
Since the virtual key you just installed in the previous section is going to be used for activating your guest operating system, it is a good practice to confirm that the correct key is installed.

Use the following command to display the **Partial Product Key** window:

Command line:

1. Start the command prompt window with administrative privileges.
2. Run the command: `S\lmgr.vbs /dli`

The `S\lmgr.vbs /dli` command displays the Partial Product key in a window similar to the one shown in the figure below.



Ensure that the Partial Product key displayed in the window matches some part of your virtual key.

Note: While performing an automated installation using a **unattend.xml** file or an **autounattend.xml** file, you can specify the virtual key in the XML file itself. If the unattended xml file has the correct virtual key, then the setup process uses the key present in the XML file instead of the activation code embedded in the Dell OEM media. In this case, you do not need to perform the "change the product key to the Virtual Key" step. It is recommended to confirm that the correct virtual key is installed. To check for the correct virtual key use the `S\lmgr.vbs /dli` command.

Since there is no support for USB in virtual machines and if the host system does not have a physical floppy drive, you can use the virtual floppy driver in the virtual environment to place the **autounattend.xml** file.

SECTION 4

ACTIVATING THE VIRTUAL INSTANCE

Activation via Internet

For online activation to be successful, the guest operating system must be able to access the internet. If you are accessing the internet via a proxy server and the proxy server is configured for basic authentication, then you can save the user credentials in the browser. The user credentials will be used to access the internet during the activation process. When the proxy server is configured for basic authentication, you must type a username and a password. However, the activation user interface does not let you enter these credentials. Therefore, the basic authentication fails, and the activation is not successful.

For more information on alternative procedures to activate Windows® Server® 2008 operating system through the internet, see the Microsoft knowledge base article located on the Microsoft Support website at <http://support.microsoft.com/kb/921471>.

Command line:

1. Start the command prompt window with Administrative privileges.
2. Run the command: `slmgr.vbs /ato`

GUI Mode:

1. Open the **System Properties** window using **Start** → **Control Panel** → **System**.
2. Click on the Activate Windows Now link in the **Windows Activation** section if the product key has already been changed to the virtual key as described in [Section 3](#).

Note: If the product key has not been changed to the virtual key, click on the **Change Product Key** link in the **Windows Activation** section and then perform the steps described in [Section 3](#) first.

Activation via Telephone

You can complete the Windows Server 2008 operating system activation by telephoning a Microsoft customer service representative. The telephone activation process requires the installation ID. Once you provide the installation ID to the Microsoft representative, you are given the *confirmation ID*.

The confirmation ID is a 42-digit integer containing the activation key and some check digits that aid in error handling. Both the installation ID and the confirmation ID are displayed to you in easily understandable segments in the product user interface. You can obtain the installation ID by using either the command line or the GUI.

Command Line:

1. Start the command prompt window with administrative privileges.
2. Run the command: `slmgr.vbs /dti`

The `slmgr.vbs /dti` command displays the installation ID and also provides the location for the **phone.inf** file. The **phone.inf** files contains the telephone number that you need to call. Normally the **phone.inf** file is located at `%systemroot%\system32\slui\phone.inf`.

Perform the following steps to activate the Windows Server 2008 operating system via the telephone:

1. Select the country from where you are making the call. Note the phone number from the **phone.inf** file.
2. Dial the phone number.
3. Provide the installation ID to the customer service representative.
4. Note the confirmation ID provided by the customer service representative.
5. Start the command prompt window with administrative privileges.
6. Run the command: `slmgr.vbs /atp <Confirmation ID>`

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GUI Mode:

1. Open the system Properties page by navigating to **Start→Control Panel→System**
2. In the **System Properties** screen click on the **Activate Windows now** link in the **Windows Activation** section.
3. Click on **Show me other ways to activate** link.
4. Click on the **Use automated Phone system**.

OR

1. Start the command prompt window with Administrative privileges.
2. Run the command: SLUI 04.

Once the telephone activation wizard is displayed, complete the following steps to activate the Windows Server 2008 operating system via the telephone:

1. Select the country from which the call is being made so that an appropriate phone number can be shown in the product UI.
2. Dial the phone number.
3. Provide the installation ID to the customer service representative.
4. Enter the confirmation ID provided by the customer service representative.

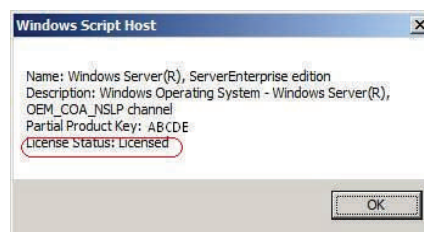
Confirming the Activation

Once you successfully complete the activation process, Windows changes the licensing status of the guest operating system installation. You can confirm the license status by using the command line or the GUI mode

Perform the following steps to confirm the license status of the guest operating system using the command line:

1. Start the command prompt window with Administrative privileges.
2. Run the command: `s\lmgr.vbs /dli`

In the result window, the license status should be displayed as **Licensed**. The figure below shows the **Windows Script Host** window with the **License Status** displayed as **Licensed**.



Perform the following steps to confirm the license status of the guest operating system using the GUI Mode:

1. Open the **System Properties** window by navigating to **Start→Control Panel→System**.
2. In the **Windows Activation** section, the **Windows is activated** message and the **Genuine Microsoft Software** logo are displayed as shown below:



SECTION 5

CREATING AND DEPLOYING MASTER VIRTUAL IMAGES

Creating the virtual machine master image also uses the same sysprep technology that is used to create a master image for the physical systems with the following exception:

1. Ensure that the guest operating system is activated before running the sysprep generalize process else you may need to activate each instance of the guest operating system separately.
2. Ensure to set the **skipream** value during the sysprep process so that the **Activation Status** or the **License Information** is not removed during the sysprep generalize process.
3. For a full unattended installation, the out of box experience (OOBE) can be automated. If the OOBE is not automated then ensure to enter the virtual key during the machine OOBE process.
4. You do not need to use the **imagex.exe** file to capture the master installation as the guest operating system installation is in the virtual disk image format.

Note: Documenting the details about the sysprep technology is beyond the scope of this document. For more information, refer to the Microsoft website.

SkipReram

Microsoft recommends using the sysprep **generalize** technology while creating master images of guest operating systems for multiple deployments. By default, the generalize process also removes the licensing information and forces the guest operating system to be activated for every deployment.

Once the guest operating system is successfully activated using the virtual key, implement the following change in the registry or the **unattend.xml** file before running the sysprep /generalize command. This change ensures that the sysprep generalize process does *NOT* reset activation-related licensing and the registry data remains.

Use any of the following methods to not remove the licensing information.

Using Registry Modification:

1. Click **Start**, click **Run**, type `regedit`, and then press <Enter>.
2. Locate and open the following registry key:
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\SL
3. Right-click the registry entry named **SkipRearm** and click **Modify**. Then change the value to any positive integer, such as 00000001. Save the changes, and close the Registry Editor.

Using Unattend.xml file

If the **unattend.xml** file is being used during the sysprep process file, then the **SkipRearm** value can also be set to 1 using the **Microsoft-Windows-Security-Licensing-SLC** component in the **generalize** pass.

The following is an example of an **unattend.xml** section to set the **SkipRearm** to 1 in the sysprep **generalize** pass.


```
<?xml version="1.0" encoding="utf-8"?>
<unattend xmlns="urn:schemas-microsoft-com:unattend">
  <settings pass="generalize">
    <component name="Microsoft-Windows-Security-Licensing-SLC"
processorArchitecture="x86" publicKeyToken="31bf3856ad364e35" lan-
guage="neutral" versionScope="nonSxS" xmlns:wcm="http://
schemas.microsoft.com/WMIConfig/2002/State" xmlns:xsi="http://
www.w3.org/2001/XMLSchema-instance">
      <SkipRearm>1</SkipRearm>
    </component>
  </settings>
</unattend>
```

Sysprep the Guest Operating System

Sysprep is a valuable tool from Microsoft that prepares a windows operating system for duplication (or cloning) and customization. It does not itself perform the actual duplication of the master image onto target machines, but helps to ensure that the security identifiers (SIDs) are unique for each new instance of operating system. Sysprep's OOB pass can be used to customize duplicated images with computer-specific information such as user name, computer name, time zone, and domain membership.

1. Ensure that there is no static IP is assigned to network adapters. It is also a good practice not to have network work interface cards installed when creating master images of guest operating system and add the card during the deployment of virtual machine.
2. Not all server roles support Sysprep. If you run the sysprep /generalize command against a Windows Server 2008 installation with specific server roles configured, those server roles may not continue to function after imaging and deployment. For the Server Roles that do not support Sysprep, you must enable the server role and configure the role settings after deployment. For details on Sysprep Support for Servers, refer to the Microsoft website.
3. The Sysprep generalize process also initializes the BCD settings so make sure correct BCD setting are configured in guest operating system after deployment.
4. Based on the sysprep command line options used i.e. sysprep /generalize /oobe or sysprep /generalize /audit the actual OOB process may required to enter the product key again. If the OOB process requires the Product key, ensure that you enter the same virtual key that is used to activate the original installation as described in [Section 3](#).

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SECTION 6

REFERENCES

- Windows Automated Deployment Kit (Windows AIK):
<http://technet2.microsoft.com/WindowsVista/en/library/a9bea038-aa10-411e-9bdc-68ced1a682051033.mspx?mfr=true>
- Unattended Windows Setup Reference:
<http://technet2.microsoft.com/WindowsVista/en/library/434e3931-a187-4940-a69c-70dd2ae657491033.mspx?mfr=true>
- Sysprep Technical Reference:
<http://technet2.microsoft.com/WindowsVista/en/library/434e3931-a187-4940-a69c-70dd2ae657491033.mspx?mfr=true>
- Sysprep Support for Server Roles
<http://technet2.microsoft.com/WindowsVista/en/library/a9bea038-aa10-411e-9bdc-68ced1a682051033.mspx?mfr=true>