WSUS

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You can use the **Windows Server Update Services (WSUS)** update server to deploy Microsoft product updates (Windows, Office, SQL Server, Exchange, etc.) to computers and servers in the company's local network. In this article, we'll walk you through how to install and configure the WSUS update server on Windows Server 2022/2019/2016, or 2012 R2.

Contents:

How does WSUS work?

The WSUS server is implemented as a separate Windows Server role. In general terms, the WSUS service can be described as follows:

- After installation, the WSUS server is scheduled to synchronize with Microsoft Update servers on the Internet and download new updates for selected products;
- The WSUS administrator selects which updates to install on company workstations and servers and approves their installation;
- WSUS clients (computers) on the local network download and install updates from your update server according to configured update policies.

How to Install WSUS Role on Windows Server 2016/2016/2012R2?

Starting with Windows Server 2008, WSUS is a separate role that can be installed through the Server Management console or using PowerShell.

If you are deploying a new WSUS server, we recommend that you install it on the latest release of Windows Server 2022 (installation on Windows Server Core is possible).

To install WSUS, open the Server Manager console and check the **Windows Server Update Services** role (the system will automatically select and offer to install the necessary IIS web server components).

install wsus role on windows 2012 server

In the next window, choose which WSUS role services you want to install. Be sure to check the **WSUS Services** option. The next two options depend on which SQL database you plan to use for WSUS.

Server settings, update metadata, and WSUS client information are stored in a SQL Server database. As a WSUS database you can use:

- Windows Internal Database (WID) – built-in Windows database (**WID Connectivity** option). This is the recommended and workable option even for large infrastructures;
- A separate Microsoft SQL Server database is deployed on a local or remote server. You can use MS SQL Enterprise, Standard (licensing required), or the free Express edition. This

is the **SQL Server Connectivity** option.

The Windows Internal Database) is recommended if:

- You don’t have unused MS SQL Server licenses;
- You are not planning to use WSUS load balancing (NLB WSUS)
- When deploying a downstream (child) WSUS server (for example, in branch offices). In this case, it is recommended to use the built-in WSUS database on secondary servers.

In the free SQL Server Express Edition, the maximum database size is limited to 10 GB. The Windows Internal Database is limited to 524 GB. For example, in my infrastructure, the size of the WSUS database for 3000 clients was about 7GB.

If you install the WSUS role and the MS SQL database on different servers, there are some limitations:

- SQL Server with WSUS database cannot be an Active Directory domain controller;
- The WSUS server cannot be deployed on a host with the Remote Desktop Services role.

The default WID database is called **SUSDB.mdf** and is stored in the folder **%windir%\wid\data**. This database supports only Windows authentication (not SQL). The internal (WID) database instance for WSUS is called **server_name\Microsoft##WID**.

The WSUS WID database can be administered through SQL Server Management Studio (SSMS) if you specify the following connection string: `\\.\pipe\MICROSOFT##WID\tsql\query`.

If you do not have enough disk space to store update files, disable this option. In this case, WSUS clients will receive approved update files from the Internet (a viable option for small networks).

wsus role services in windows server manager

If you want to store update files locally on the WSUS server, enable the option **Store updates in the following locations** and specify the directory path. This can be a folder on a local disk (a separate physical or logical volume is recommended), or a network location (UNC path). Updates are downloaded to the specified directory only after they have been approved by the WSUS administrator.

The size of the WSUS database is highly dependent on the number of Microsoft products and the Windows versions you plan to update. In a large organization, the size of update files on a WSUS server can reach hundreds of GB.

If you do not have enough disk space to store update files, disable this option. In this case, WSUS clients will receive approved update files from the Internet (a viable option for small networks).

folder for windows updates store

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You can also install a WSUS server with an internal database (WID) using the following PowerShell command:

```
Install-WindowsFeature -Name UpdateServices, UpdateServices-WidDB, UpdateServices-Services, UpdateServices-RSAT, UpdateServices-API, UpdateServices-UI -IncludeManagementTools
```

Initial WSUS Configuration on Windows Server

After you finish installing the WSUS role, you need to complete its initial configuration. Open Server Manager and select Post-Deployment Configuration -> Launch Post-Installation tasks.

wsus post install tasks

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You can use the WsusUtil.exe console tool to manage WSUS from the command prompt. For example, to change the path to the WSUS update files directory, run:

```
CD "C:\Program Files\Update Services\Tools"
WsusUtil.exe PostInstall CONTENT_DIR=D:\WSUS
```

Or, for example, you can switch your WSUS to an external SQL Server database:

```
wsusutil.exe postinstall SQL_INSTANCE_NAME="MUN-SQL1\WSUSDB" CONTENT_DIR=D:\WSUS_Content
```

Then open the Windows Server Update Services console. The WSUS Update Server Initial Configuration Wizard starts.

Specify whether the WSUS server will download updates from the Microsoft Update site directly (**Synchronize from Microsoft Update**) or if it should receive them from an upstream WSUS server (**Synchronize from another Windows Update Services server**). Downstream WSUS servers are usually deployed at remote sites with a large number of clients (300+) to reduce the load on the WAN link.

On Windows 10 and 11, you can use Delivery Optimization to reduce the bandwidth usage of update traffic on your communication channels.

wsus upstream server

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If your access the Internet through a proxy server, you need to specify the address and port of the proxy server, as well as authentication credentials.

proxy server settings for upstream connection
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Next, check the connection to the upstream update server (or Windows Update). Click **Start Connecting**.

Start Connecting upstream wsus server
Image not found or type unknown

Then you need to select the product languages for which WSUS will download updates. We select **English** (the list of the languages can further be changed from the WSUS console).

select wsus languages
Image not found or type unknown

Then specify the list of products for which the WSUS should download updates. Select only those Microsoft products that are used in your environment. For example, if you are sure that there are no Windows 7 or Windows 8 computers left on your network, don't select these options. This will significantly save space on the WSUS server drive.

Be sure to include the following general sections in the WSUS classification:

- **Developer Tools, Runtimes, and Redistributable** — used to update Visual C++ Runtime libraries;
- **Windows Dictionary Updates** in the Windows category;
- **Windows Server Manager** – Windows Server Update Services (WSUS) Dynamic Installer.

If necessary, you can manually import any updates from the Microsoft Update Catalog to your WSUS server.

Specify products which you want update
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On the **Classification Page**, you need to specify the types of updates to be deployed via WSUS. It is recommended to select: Critical Updates, Definition Updates, Security Packs, Service Packs, Update Rollups, and Updates.

wsus update classifications
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The Windows 10 build upgrades (21H2, 20H2, 1909, etc.) in the WSUS console are included in the **Upgrades** class.

Configure your update synchronization schedule. It is recommended to use the automatic daily synchronization of the WSUS server with Microsoft Update servers. The WSUS synchronization should be performed at night, in order not to impact the Internet channel during business hours.

wsus synchronization schedule
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The initial synchronization of the WSUS server with the upstream update server may take up to several days, depending on the number of products you chose earlier and your ISP.

After the wizard is done, the WSUS console will start.

Update Service console

There are several sections in the WSUS console tree:

- **Updates** – available updates on the WSUS server (here you can manage the update approvals and assign them for installation);
- **Computers** – here you can manage WSUS client groups (computers, servers, test, and production groups, etc.);
- **Downstream Servers** – allows you to configure whether you receive from Windows Update or an upstream WSUS server;
- **Synchronizations** – update synchronization schedule;
- **Reports** –different WSUS reports;
- **Options** –WSUS configuration settings.

Further steps for configuring WSUS (approving WSUS updates, creating and configuring update groups for computers and servers) are described in separate posts:

- **Part 2.** Create a GPO to configure clients to use WSUS
- **Part 3.** How to Approve and Deploy WSUS Updates?

Clients can now receive updates by connecting to the WSUS server on port 8530 (in Windows Server 2003 and 2008, port 80 is used by default). Check that this port is open on the WSUShost:

```
Test-NetConnection -ComputerName yourwsushost1 -Port 8530
```

You can use a secure SSL connection on port 8531. To do this, you need to bind a certificate to the WSUS Administration website in IIS.

If the port is closed, create an allow rule in Windows Defender Firewall.

How to Install WSUS Management Console on Windows 10 and 11?

You use the Windows Server Update Services console (`wsus.msc`) to manage WSUS. You can manage WSUS hosts either using the local console or over the network from a remote computer.

The WSUS Administration Console for Windows 10 or 11 is installed from the Remote Server Administration Tools (RSAT). To install the **Rsat.WSUS.Tool** component, run the following PowerShell command:

```
Add-WindowsCapability -Online -Name Rsat.WSUS.Tools~~~~0.0.1.0
```

If you want to install the WSUS console on Windows Server, use the command:

```
Install-WindowsFeature -Name UpdateServices-Ui
```

wsus management console

When you install WSUS on Windows Server, two additional local groups are created. You can use them to grant users access to the WSUS management console.

- WSUS Administrators
- WSUS Reporters

To view reports about updates and clients on WSUS, you must install:

- Microsoft System CLR Types for SQL Server 2012 (SQLSysClrTypes.msi);
- Microsoft Report Viewer 2012 Runtime (ReportViewer.msi).

To view different update reports in the WSUS console, you must install the optional **Microsoft Report Viewer 2008 SP1 Redistributable** (or higher) components on your server.

If these components are not installed, then when generating any WSUS report, an error will appear:

```
The Microsoft Report Viewer 2012 Redistributable is required for this feature. Please close the console before insta
```

install ms wsus report viewer

Optimizing WSUS Performance

This section describes a few tips for optimizing the performance of the WSUS Update Server in a real-world environment.

- For WSUS to work properly, the update host must have at least 4 GB of RAM and 2CPU free;
- With a large number of WSUS clients (more than 1500), you may experience significant performance degradation of the IIS WsusPoll pool that distributes updates to clients. Error **0x80244022** may appear on clients, or when starting the WSUS console, it may crash with an error **Error: Unexpected Error + Event ID 7053** in the Event Viewer (`The WSUS administration console has encountered an unexpected error. This may be a transient error; try restarting the administration console. If this error persists`).

To resolve this issue, you need to add more RAM to your WSUS host and optimize your IIS pool settings as recommended in the article. Use these PowerShell commands:

```
Import-Module WebAdministration
Set-ItemProperty -Path IIS:\AppPools\WsusPool -Name queueLength -Value 2500
Set-ItemProperty -Path IIS:\AppPools\WsusPool -Name cpu.resetInterval -Value "00.00:15:00"
Set-ItemProperty -Path IIS:\AppPools\WsusPool -Name recycling.periodicRestart.privateMemory -Value 0
Set-ItemProperty -Path IIS:\AppPools\WsusPool -Name failure.loadBalancerCapabilities -Value "TcpLevel"
```

- Enable automatic approval for Microsoft antivirus signature/definition updates. Otherwise, WSUS can slow down significantly and consume all available RAM.

Antivirus checks can negatively impact WSUS performance. In the built-in Microsoft Defender Antivirus in Windows Server, it is recommended to exclude the following folders from the Real-time protection scope:

- \WSUS\WSUSContent;
- %windir%\wid\data;
- \SoftwareDistribution\Download.

Stay tuned!