



Setting the Standard in WSUS Automated Maintenance

Documentation

Version 2023.01
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Thank You! & Forward

First, I want to personally thank you for choosing to license WSUS Automated Maintenance (WAM)[®] for each of your WSUS or SUP servers. You have chosen the standard in maintaining WSUS automatically.

I developed the WAM system to be easy to install, easy to use, and easy to maintain. WAM uses the K.I.S.S. method so if you are having an issue, you are probably over-thinking it. If you accept the default settings (which are good for almost all scenarios out there), all that is required is email server settings so that the system can send you daily reports. You should be reviewing the reports daily for about 5-15 seconds to make sure there are no errors, or anything that you are not expecting, before deleting them.

If you have any issues, or questions regarding WAM, please reach out to our support staff using our support section of our website (<https://www.ajtek.ca/support/>) and we will be happy to help you.

Welcome to WSUS Freedom!

A handwritten signature in black ink that reads "Adam Marshall". The signature is fluid and cursive, with the first name "Adam" and last name "Marshall" clearly distinguishable.

Adam J Marshall
President

WSUS Automated Maintenance Installation

Where Do You Install WSUS Automated Maintenance?

WSUS Automated Maintenance (WAM) must be licensed and used on ALL WSUS Servers in your WSUS System including Online/Offline/Disconnected Upstream Servers, Downstream Servers (Replica Servers or Autonomous Servers), and Stand Alone WSUS Servers. It must be installed directly on the WSUS server itself and NOT on a client system with RSAT tools installed. WAM will automatically detect what system it is installed on and perform only the tasks associated with that type of WSUS server.

When performing the WSUS maintenance, Microsoft recommends performing it from the downstream first and then making your way upstream, the opposite of approving updates which flow from the top down. What you want to avoid is that WAM performs the maintenance at the upstream first and have the downstream synchronize with the upstream. This will cause the downstream to start to become out of sync with the way the maintenance works. As time continues (multiple weeks), it may grow more and more out of sync from the upstream.

When installing WAM on an upstream/downstream system, you should schedule the runs at or around the same time if spanning multiple time zones. You want to do this so that they simultaneously run at a time that is not going to interfere with your synchronization schedules. The default is 8AM local time which is suitable for most environments.

Interactive Installation Mode

1. Install the [system requirements](#) on your WSUS server.
2. Run the installer on your WSUS server with a user account that has local administrative rights on the WSUS server. If you are using a remote SQL server, ensure the account being used is also a local administrator of that server. See the [Security & Permissions Requirements](#) for more information as to why.
3. Follow the easy-to-use installer.
4. Finish and allow the -FirstRun to complete.

Unattended Installation Mode

1. Install the [system requirements](#) on your WSUS server. If you have not installed the system requirements, WAM will detect and alert you that you are missing the system requirements and exit with an error code when run in unattended mode.
2. Extract or open the EXE with 7-Zip or other zip extraction tools.
3. Take the \$LOCALAPPDATA\AJ Tek\WAM\Configuration.ps1 file and extract or copy it to another location. This Configuration.ps1 file will be your unattended configuration file and it will overwrite the Configuration.ps1 file that gets installed with the software. Open it with Notepad or other text editor and edit the variables to suit your needs. An alternative way to configure this file is to install the software in interactive mode using the Advanced setup type, and then at the end grab the Configuration.ps1 file from C:\ProgramData\AJ Tek\WAM\.
 - a. If you have multiple systems to deploy the software to, you will need a configuration file for each location. You can use 1 configuration file for all sites, or you can customize each site by naming the Configuration.ps1 file according to the WSUS location's settings (e.g.,

Configuration.USA.ps1, Configuration.Canada.ps1, Configuration.Europe.ps1,
Configuration.Germany.ps1)

4. If you require authentication for your email server settings, you have 3 ways to get this done.
 - a. Unattended: Specify it in the configuration file in plain text (not recommended).
 - b. Unattended but requires email server re-configuration: Create a relay to use without authentication.
 - c. Combination Unattended & Interactive: After installing WAM in unattended mode, interactively PSRemote into the server and follow the steps below on each deployed server.

If you **ARE NOT** using Microsoft Graph authentication for sending mail:

Run the following command which will prompt you for the authentication credentials for that server. WAM will then use the secure credentials stored in the file.

```
& "$env:ProgramFiles\AJ Tek\WAM\Clean-WSUS.ps1" -  
SetMailAuthentication
```

If you are going to be using the same mail server information and you have already ran this command on another server with WAM on it, you can copy the three mail authentication files in WAM's program data folder (%ProgramData%\AJ Tek\WAM) to the new server instead of running that command.

The three files required to copy for mail authentication are:

- i. Credentials_AES_Key.txt
- ii. Credentials_Encrypted_Password.txt
- iii. Credentials_UserName.txt

If you **ARE** using Microsoft Graph authentication for mailing reports:

Run the following command which will prompt you for the password to the private key (.pfx file) you generated in the Graph mailing setup guide ([Mailing Reports Using the Graph API](#)). You will also need to copy the private key (.pfx file) to WAM's program data folder (%ProgramData%\AJ Tek\WAM) and ensure the .pfx file is named "Graph_Certificate.pfx".

```
& "$env:ProgramFiles\AJ Tek\WAM\Clean-WSUS.ps1" -  
SetGraphCertificatePassword
```

If you are going to be using the same mail server information and you have already ran this command on another server with WAM on it and have saved the private key (.pfx) and the encrypted credentials there already, you can copy the three Graph authentication files in WAM's program data folder (%ProgramData%\AJ Tek\WAM) to the new server instead of running that command.

The three files required to copy for Graph authentication are:

- i. Graph_Certificate.pfx

- ii. Graph_Certificate_Encrypted_Password.txt
 - iii. Graph_Certificate_Password_AES_Key.txt
5. Run the installer from an administrative command or PowerShell prompt using a user account that has local administrative rights on both the WSUS server and the SQL server if you are using a remote SQL server. Take note of the following switches and examples (the switches are case sensitive):

To determine which switches are available:

WAM.exe /?

Example 1: Silently install WAM to the default install folder (C:\Program Files\AJ Tek\WAM) and use the "Configuration File.ps1" which is in the same folder as the installer.

```
WAM.exe /S /I-ACCEPT-EULA /F "Configuration File.ps1" /LICENSE  
"LicenseFile.lic"
```

Example 2: Silently install WAM to the install folder of "D:\AJ Tek\WAM" and use the "Configuration File.ps1" which is in the same folder.

```
WAM.exe /S /I-ACCEPT-EULA /F "Configuration File.ps1" /D "D:\AJ Tek\WAM"  
/LICENSE "LicenseFile.lic"
```

Example 3: Silently install WAM to the install folder of "D:\WAM" and use the configuration file in the UNC path [\\morpheus\Deployment\WAM.Configuration.Ontario.ps1](#)

```
WAM.exe /S /I-ACCEPT-EULA /F  
"\\morpheus\Deployment\WAM.Configuration.Ontario.ps1" /D D:\WAM /LICENSE  
"LicenseFile.lic"
```

Example 4: Silently install WAM to the default install folder (C:\Program Files\AJ Tek\WAM) and use the "Configuration File.ps1" which is in the Configs subfolder where the installer is located.

```
WAM.exe /S /I-ACCEPT-EULA /F "Configs\Configuration.ps1" /LICENSE  
"LicenseFile.lic"
```

If you have manually copied your WAM license file to [%ProgramData%\AJ Tek\WAM\WAM License.lic] you can omit the /LICENSE switch from the installer command line in the examples above. If no license file exists and you have not specified the /LICENSE parameter, the installer will exit out with an error code.

Upgrades

Are you upgrading from a previous version? Please follow these easy steps to upgrade WAM to the latest version. Upgrades starting from version 2020.01 will now KEEP your existing configuration while setting all new options to their default setting. If AJ Tek mandatory configuration changes are required, they will then overwrite your settings.

Upgrading from v3.5 or higher to 2023.01

1. Download your license from the AJ Tek website. This will be used later in the installation process and is required to use the installer.
2. Verify that you have the [system requirements](#) installed on your WSUS server – they may have changed. If you have not installed at least the minimum system requirements, WAM will detect and alert you that you are missing the system requirements.
3. Install 2023.01 over top of your current installation. The installer will upgrade the software while keeping your existing configuration.

From v3.2 or earlier to 2023.01

1. Download your license from the AJ Tek website. This will be used later in the installation process and is required to use the installer.
2. Verify that you have the [system requirements](#) installed on your WSUS server – they may have changed. If you have not installed at least the minimum system requirements, WAM will detect and alert you that you are missing the system requirements.
3. Install 2023.01.
4. Delete Clean-WSUS.ps1 from wherever it previously was.

Unattended Upgrades

1. Download your license from the AJ Tek website. This will be used later in the installation process and is required to use the installer.
2. Verify that you have the [system requirements](#) installed on your WSUS server – they may have changed. If you have not installed at least the minimum system requirements, WAM will detect and alert you that you are missing the system requirements and exit with an error code when run in unattended mode.
3. Specify the license file using the /LICENSE switch while executing the installer. Alternatively, you may copy the license file you downloaded to [%ProgramData%\AJ Tek\WAM\WAM License.lic] before running the upgrade and omit the /LICENSE switch.

If using the /LICENSE switch to specify your license file, run:

```
WAM.exe /S /U /I-ACCEPT-EULA /LICENSE "LicenseFile.lic"
```

If you already copied your license file, run:

```
WAM.exe /S /U /I-ACCEPT-EULA
```

Uninstallation

Interactive Uninstallation Mode

You will find WSUS Automated Maintenance listed in “Settings > Apps & Features” or “Add/Remove Programs” and in the [Windows Menu](#). Either one of these methods will interactively run the Uninstaller which will prompt you if you wish to keep your Configuration, Logs & Backup Folder. If you keep your Configuration, if you re-install WAM, it will re-use your existing configuration file so make sure you are reinstalling the SAME version of WAM.

Unattended Uninstallation Mode

Run the uninstaller manually through an Administrative PowerShell prompt. The default without the /REMOVE switch will keep the configuration, logs, and default backup folder.

The following switches are available for the uninstaller.

```
/S - [Silent, Keeping Configuration, Logs, and the Default Backup folder]  
/S /REMOVE - [Silent, Remove Configuration, Logs, and Default Backup folder]
```

Example 1: Dynamically & Silently Uninstall WAM Removing the Configuration, Logs, and the Default Backup Folder - From an Administrative PowerShell Prompt:

```
& $("$(Get-ItemProperty -Path 'HKLM:\SOFTWARE\AJ Tek\WAM' -Name 'Install_Dir'  
| Select-Object -ExpandProperty 'Install_Dir')\Uninstall.exe") /S /REMOVE
```

Example 2: Dynamically & Silently Uninstall WAM Keeping the Configuration, Logs, and the Default Backup Folder - From an Administrative PowerShell Prompt:

```
& $("$(Get-ItemProperty -Path 'HKLM:\SOFTWARE\AJ Tek\WAM' -Name 'Install_Dir'  
| Select-Object -ExpandProperty 'Install_Dir')\Uninstall.exe") /S
```

Security & Permission Requirements

WSUS Automated Maintenance is developed using the principle of least privilege.

The Installer:

Run the installer with an account that has local administrator permissions on the WSUS server. If you are using a remote SQL server, make sure this account also has the sysadmin role permission. This will allow the installer to setup the required permissions for you. This is usually a user account with Domain Administrator privileges.

Service Account:

It is recommended to switch the scheduled task to use a service account and to apply the principal of least privilege. If you are using a Service Account, you must make sure that the service account has the appropriate permissions for each part.

- Local Admin on the WSUS Server. ([Task Scheduler Permissions](#))
- Have the 'logon as a batch job' user right. ([Task Scheduler Permissions](#))
- Having the SQL 'db_owner' role on the SUSDB database ([SQL Permissions](#))
- Having modify rights for file system access to the backups location. ([Storing Logs or Backups on Network Shares](#))

To use a Service Account, enable it from the Advanced Installation through the installer or edit it through the WAM Configuration. If you are editing it manually through the WAM Configuration, you must run

```
.\Clean-WSUS.ps1 -SetServiceAccountCredentials
```

From the WAM Shell to create the necessary encrypted files for authentication.

Task Scheduler Permissions:

The account that is used to run the scheduled task needs to be a local administrator and have the 'logon as a batch job' user right. If a service account is not used, the default is using NT AUTHORITY\SYSTEM. This account DOES NOT store the password in the task scheduler and will only have access to the local computer resources. It must be enabled to run with the highest privileges.

SQL Permissions:

Using the Windows Internal Database (WID) or a Local SQL Server Instance

There are no special requirements when using the WID or a local SQL instance. By default, the [BUILTIN\Local Administrators] group is added in SQL as a sysadmin.

Using a Remote SQL Server Instance

The Active Directory computer object of the WSUS server has already been added to the remote SQL server so that WSUS can use it. WAM requires that this AD computer object have the [db_owner] role on the WSUS [SUSDB] database.

Storing Logs or Backups on Network Shares

If you are not using a service account, the [NETWORK SERVICE] security principal uses the Active Directory computer account for permission on remote systems. Make sure to grant the computer

account modify rights to the folder in which you want the logs or backups to be saved to. For a service account, make sure to grant the service account modify rights to the folder in which you want the logs or backups to be saved to.

How WAM Starts Daily:

Task Scheduler will invoke WAM as a local administrator with elevated rights and uses Microsoft's PowerShell API calls to perform its tasks. It does this while not storing the password of the account in the Task Scheduler (unless you have modified the task to use a service account). WAM will also invoke sqlcmd.exe using the elevated user account. If a remote SQL server is used and the scheduled task does not use a service account, this will then invoke network access using the [NETWORK SERVICE] security principal which utilizes the Active Directory computer account for permission on remote systems. If a remote SQL server is used and the scheduled task does use a service account, this will then invoke network access using the [Service Account] for permission on remote systems.

Mailing Reports Using the Microsoft Graph API

WAM 2023.01 introduces initial support for sending WAM's reports using the Microsoft Graph API. If your current mailing configuration is working you are advised to keep using it unless you wish to transition to using Microsoft Graph.

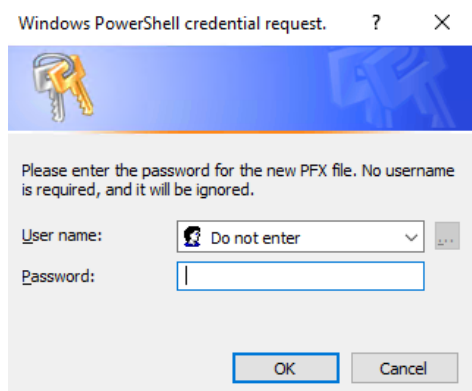
Setting up Graph API Mailing

A guide for setting up Graph API mailing can be found below.

Generating a Certificate to use for Authentication

1. Open the WAM shell. Use the cmdlet `New-GraphAPICertificate` to generate a new certificate (.cer) and PFX (.pfx) that will be used for WAM to authenticate with the Graph API.

The cmdlet will prompt for a password for the new .pfx file – **save this password**. It is strongly recommended you keep a note of the password, as it may be needed in the future when setting Graph mailing up with other WSUS servers running WAM.



After the cmdlet finishes the new certificate and PFX file **will be exported to your Desktop**. Additionally, this cmdlet will copy the new .pfx file to WAM's program data directory as WAM searches for a .pfx file named `Graph_Certificate.pfx` to use for authentication.

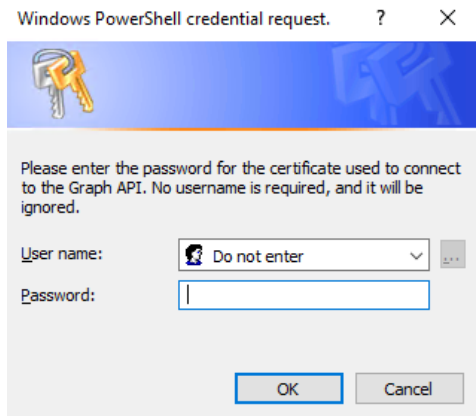
The password for the PFX file will also be stored (encrypted) in WAM's program data directory under two files: `Graph_Certificate_Encrypted_Password.txt` and `Graph_Certificate_Password_AES_Key.txt`. These files (`Graph_Certificate.pfx`, `Graph_Certificate_Encrypted_Password.txt`, and `Graph_Certificate_Password_AES_Key.txt`) can be copied to other WSUS servers running WAM as an alternative to running `. \Clean-WSUS.ps1 - SetGraphCertificatePassword` when setting up Graph authentication on those servers.

Storing the Graph certificate password

This step is automatically performed when setting up a new Graph certificate/private key combo, however it can also be run manually using `. \Clean-WSUS.ps1 - SetGraphCertificatePassword` from the WAM shell.

After the .pfx file has been created, we can tell WAM the password to use to read the .pfx file and let WAM store the password securely. When running `. \Clean-WSUS.ps1 -`

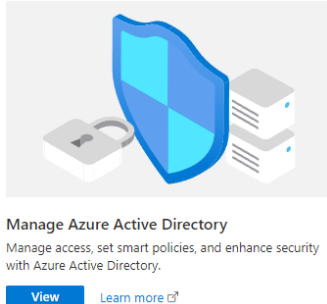
SetGraphCertificatePassword from the WAM shell, the command will prompt you for the same password used in the New-GraphAPICertificate cmdlet.



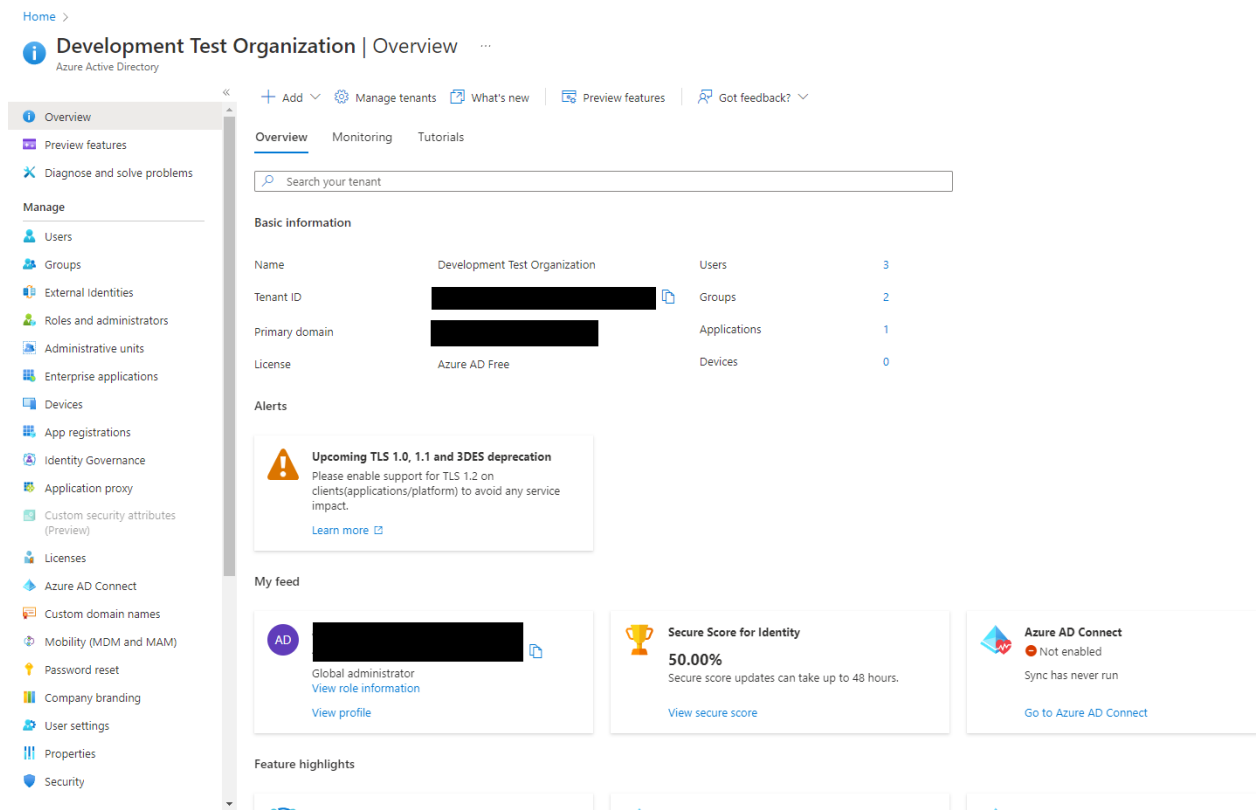
After creating the certificate/private key combo and giving WAM the password to use the private key (PFX file), all that is left is uploading the certificate to the previously created application on Azure Active Directory.

Creating the Application in Azure

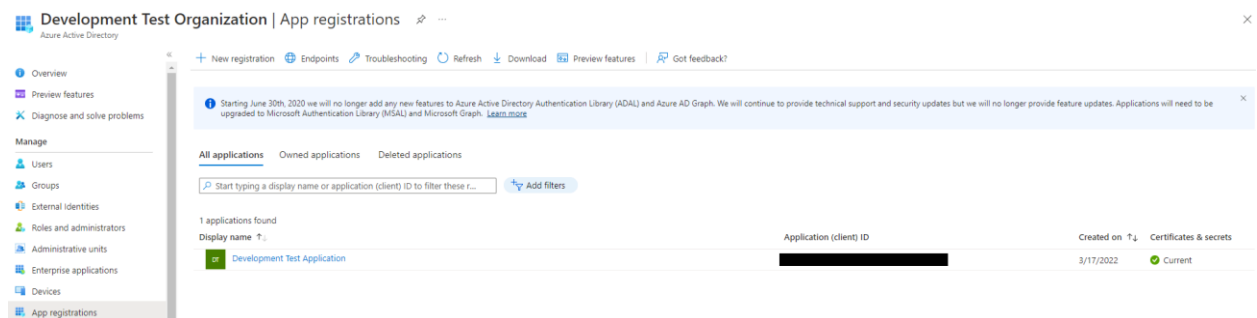
2. Visit <https://portal.azure.com/> and ensure that you're logged into an account with sufficient privileges to create a new application for your domain/tenant. After you're signed in, visit the Azure Active Directory management page.



Ensure that you are on the tenant that you'll be sending email from by visiting the Overview section on the left menu.



3. Click on “App registrations” on the left menu and that will bring you to a page for setting up new applications.



4. Click on “New registration” and it will bring you to a page to register an application. The supported account types may need to be changed depending on your tenant setup and who you are sending the WAM mail reports to, so please keep this in mind when creating the application. You can find an explanation of the differences between account types by clicking on “Help me choose” on the application registration page. **A redirect URI is not required.** Click on Register to register the Application.

Register an application ...

* Name

The user-facing display name for this application (this can be changed later).

WAM Mailing Reporting Application ✓

Supported account types

Who can use this application or access this API?

- ☒ Accounts in this organizational directory only (Development Test Organization only - Single tenant)
- ☐ Accounts in any organizational directory (Any Azure AD directory - Multitenant)
- ☐ Accounts in any organizational directory (Any Azure AD directory - Multitenant) and personal Microsoft accounts (e.g. Skype, Xbox)
- ☐ Personal Microsoft accounts only

[Help me choose...](#)

Redirect URI (optional)

We'll return the authentication response to this URI after successfully authenticating the user. Providing this now is optional and it can be changed later, but a value is required for most authentication scenarios.

Select a platform ▼ e.g. https://example.com/auth

Register an app you're working on here. Integrate gallery apps and other apps from outside your organization by adding from [Enterprise applications](#).

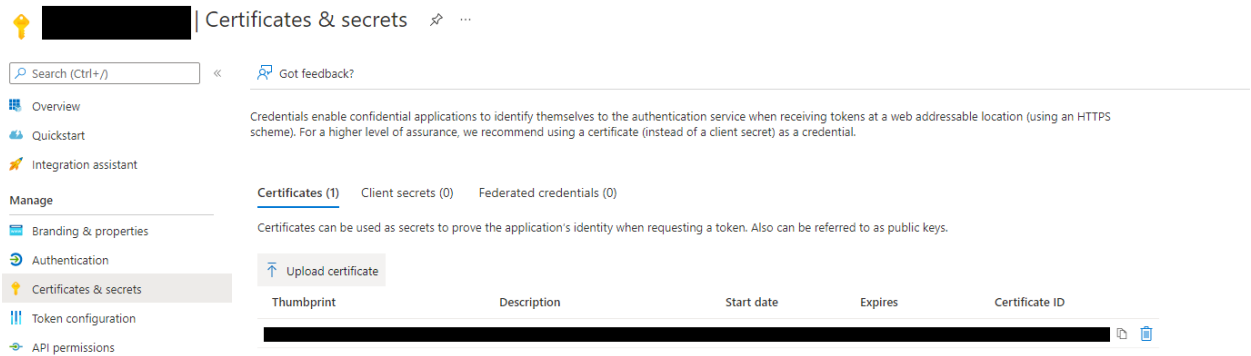
By proceeding, you agree to the [Microsoft Platform Policies](#) 

Register

- After registering the application, you will be redirected to the application's configuration page. There are two things that you should take note of on this page: **Application (client) ID** and **Directory (tenant) ID**. These two variables will be used in the WAM configuration for \$AJTekMailReportGraphApplicationId and \$AJTekMailReportGraphTenantId respectively. If you forget to record the values, visit the application configuration page again at any time and they will be available.

Uploading the new Certificate to Azure Active Directory

- While on the application configuration page, click on "Certificates & secrets". Under this page you will find a list of certificates that can be used to authenticate with the application. We will need to upload the new .cer file created from the first step by clicking "Upload certificate".




A new prompt should be shown. Select the new .cer file from before and optionally give the certificate a description.

Upload certificate

×

Upload a certificate (public key) with one of the following file types: .cer, .pem, .crt *



Description

After uploading the certificate, it will appear in the list of certificates for the application and you can proceed to the next step.

Configuring WAM to use the Graph API for mailing

- Now that we have the mailing application set up for WAM to use, all that is left is changing the variables in WAM's configuration to use the Graph API for mailing reports.

Open the WAM configuration using the start menu shortcut Windows Menu > Programs > AJ Tek > WAM Configuration (not WAM Configuration (GUI)). Find and replace the following variables with the information you obtained when setting up the mailing application for WAM.

- ✓ Set `$AJTekMailReportUseGraphAuthentication` to `$True`
This is what tells WAM to use the Graph API for sending mail, and not your mail credentials.
- ✓ Set `$AJTekMailReportGraphApplicationId` to your **Application (client) ID**.
e.g.: "3ea6e406-d310-4291-8c72-750550f38e09"
- ✓ Set `$AJTekMailReportGraphTenantId` to your **Directory (tenant) ID**.
e.g.: "f761045c-52ed-44ea-8d51-66007cbc7c12"
- ✓ Double check to ensure that `$AJTekMailReportEmailFromAddress` and `$AJTekMailReportEmailToAddress` are set to the proper addresses, which will be from the domain you set up Graph mailing for.

Now WAM will use the Graph API for sending its mail reports.

NOTE: If you no longer wish to use the Graph API for mailing reports, simply setting `$AJTekMailReportUseGraphAuthentication` to `$False` again is enough to tell WAM not to use the Graph API. The other Graph related files and configuration variables can be left alone or removed for proper cleanup.

WSUS Automated Maintenance Routines

There are 5 routines that WSUS Automated Maintenance has.

- FirstRun
- ScheduledRun
- DailyRun
- MonthlyRun
- QuarterlyRun

FirstRun

-FirstRun will run the following streams in the following order. This is intended to only be run on the first time or explicitly indicated by the software or our support staff.

1. SQLDatabaseBackup
2. DatabaseIndexOptimization
3. RemoveDriversSQL
4. RemoveObsoleteUpdates
5. CompressUpdateRevisions
6. DeclineMultipleTypesOfUpdates (Forcefully declining any of the enabled types)
7. RemoveSynchronizationLogs
8. RemoveComputerObjects
9. RenameOSDescriptions
10. DatabaseMaintenance
11. ServerCleanupWizard
12. Install-Task

ScheduledRun

-ScheduledRun will run the following streams in the following order. It automatically considers if this is the monthly streams day, and if it is the start of the next quarter. Essentially, this is the automation of the entire system.

1. SQLDatabaseBackup (monthly and quarterly)
2. RemoveObsoleteUpdates
3. CompressUpdateRevisions
4. (IF QUARTERLY)
 - a. RemoveDrivers
 - b. RemoveDeclinedUpdates
5. DeclineMultipleTypesOfUpdates (Adheres to the frequency options defined in the configuration)
6. RemoveSynchronizationLogs
7. DisplayNewlyAddedProducts (monthly and quarterly)
8. PruneIISLogs (monthly and quarterly)
9. RemoveComputerObjects
10. RenameOSDescriptions
11. DatabaseMaintenance
12. ServerCleanupWizard

DailyRun

-DailyRun will run the following streams in the following order. It only considers what is done daily and will not run anything that would run monthly or quarterly.

1. RemoveObsoleteUpdates
2. CompressUpdateRevisions
3. DeclineMultipleTypesOfUpdates (Adheres to the frequency options defined in the configuration)
4. RemoveSynchronizationLogs
5. RemoveComputerObjects
6. RenameOSDescriptions
7. DatabaseMaintenance
8. ServerCleanupWizard

MonthlyRun

-MonthlyRun will run the following streams in the following order. It only considers what is done monthly and will not run anything that would run quarterly. Since the daily tasks are also embedded in the monthly tasks, it performs them too.

1. SQLDatabaseBackup
2. RemoveObsoleteUpdates
3. CompressUpdateRevisions
4. DeclineMultipleTypesOfUpdates (Forcefully declining any of the enabled types)
5. RemoveSynchronizationLogs
6. DisplayNewlyAddedProducts
7. PruneISLogs
8. RemoveComputerObjects
9. RenameOSDescriptions
10. DatabaseMaintenance
11. SQLDatabaseShrink (If Monthly)
12. ServerCleanupWizard

QuarterlyRun

-QuarterlyRun will run the following streams in the following order. Since the daily and monthly tasks are also embedded in the quarterly tasks, it performs them too.

1. SQLDatabaseBackup
2. RemoveObsoleteUpdates
3. CompressUpdateRevisions
4. RemoveDrivers
5. RemoveDeclinedUpdates
6. DeclineMultipleTypesOfUpdates (Forcefully declining any of the enabled types)
7. RemoveSynchronizationLogs
8. DisplayNewlyAddedProducts
9. PruneISLogs
10. RemoveComputerObjects
11. RenameOSDescriptions

12. DatabaseMaintenance
13. SQLDatabaseShrink (If Quarterly)
14. ServerCleanupWizard

WAM Shell Syntax Examples

To run these Streams manually from the WAM Shell.

Example 1: Run -FirstRun

```
.\Clean-WSUS.ps1 -FirstRun
```

Example 2: Run -ScheduledRun

```
.\Clean-WSUS.ps1 -ScheduledRun
```

Example 3: Run -DailyRun

```
.\Clean-WSUS.ps1 -DailyRun
```

Example 4: Run -MonthlyRun

```
.\Clean-WSUS.ps1 -MonthlyRun
```

Example 5: Run -QuarterlyRun

```
.\Clean-WSUS.ps1 -QuarterlyRun
```

Windows Menu Items

The Windows menu carries some notable items for WAM. They are found at

Windows Menu > Programs > AJ Tek

- WAM Backups
- WAM Configuration
- WAM Configuration (GUI)
- WAM Documentation
- WAM Logs
- WAM Shell
- Uninstall WSUS Automated Maintenance

WAM Backups

WAM's backups will be stored in "%ProgramData%\AJ Tek\WAM\Backups" but can be configured to be relocated to anywhere you would like inside the WAM Configuration.

WAM Configuration

This is a shortcut to the Configuration.ps1 file located at "%ProgramData%\AJ Tek\WAM\Configuration.ps1". This shortcut will open Notepad for editing this file.

WAM Configuration (GUI)

A shortcut to launch WAM's installer in configuration mode. This will allow you to configure almost anything in WAM for your WAM installation, and will bring you to the Advanced Configuration section of the installer.

The installer this shortcut refers to is an internal copy of the installer used to install WAM, which resides in "%ProgramFiles%\AJ Tek\WAM\" as WAM.exe. The installer that you used to install WAM after downloading it from the WAM website can be safely removed.

WAM Documentation

This is a shortcut to the documentation PDF (this PDF) which is in "%ProgramFiles%\AJ Tek\WAM\". As most Servers do not have a PDF viewer installed, this documentation is also included in the Zip file of the software download.

WAM Logs

WAM's logs are in %ProgramData%\AJ Tek\WAM\Logs and cannot be relocated. All logs that are not emailed will be placed here.

WAM Shell

If you have any reason to run the software manually, you will need to load up the WAM Shell from the Windows Menu (Windows Menu > Programs > AJ Tek > WAM Shell).

You can then run the software manually by using the following syntax:

```
.\Clean-WSUS.ps1 <switches>
```

If you want to see all the built-in PowerShell syntax help for the software, you can use:


```
Get-Help .\Clean-WSUS.ps1
Get-Help .\Clean-WSUS.ps1 -Examples
Get-Help .\Clean-WSUS.ps1 -Full
```

WAM Weekly Reporting

WAM 2022.07 introduces support for weekly reporting. While this feature is available, we still recommend you keep reporting set to daily and do brief, daily checks on your WAM reports.

To enable weekly reporting, you can set the \$AJTekMailReportFrequency variable to 'Weekly' and change the \$AJTekMailReportWeeklyMailDay variable to the name of the day of the week you'd like to receive the weekly reports on. If you'd like to disable weekly reporting, set the \$AJTekMailReportFrequency back to 'Daily'.

WAM Shell Switches: -SaveReport & -MailReport

When running WAM manually from the Shell and you are not running one of the Predefined Routines, you ***MUST*** have the report directed somewhere.

-SaveReport will save the report as either TXT or HTML in the WAM Logs folder which is accessible from the Windows Menu (Windows Menu > Programs > AJ Tek > WAM Logs)

%ProgramData%\AJ Tek\WAM\Logs

-MailReport will email the report as either TXT or HTML using the mail server information and to the email address(es) specified in the WAM Configuration file. If for some reason the email fails to send, it will fall back to SaveReport storing a TXT log in the Logs folder. The TXT log that it creates will be prepended with the notification that the email failed to send and will give the full error message for troubleshooting.

When using weekly reporting, reports will be stored the temporary folder %ProgramData%\AJ Tek\WAM\QueuedReports.

Example 1: Save the report as a TXT file

```
.\Clean-WSUS.ps1 -SaveReport TXT
```

Example 2: Save the report as an HTML file

```
.\Clean-WSUS.ps1 -SaveReport HTML
```

Example 3: Mail the report as an HTML email

```
.\Clean-WSUS.ps1 -MailReport HTML
```

Example 4: Mail the report as a plain text email

```
.\Clean-WSUS.ps1 -MailReport TXT
```

Example 5: Save the report as a TXT file and mail the report as an HTML email

```
.\Clean-WSUS.ps1 -SaveReport TXT -MailReport HTML
```

Uninstall WSUS Automated Maintenance

This shortcut will execute the uninstaller to remove WAM from the system.

Explanations of Each Stream

SQL Database Backup Stream

This stream will back up the SQL database to a file in the configured backup location and keep those backups in the backup location from getting out of control. This will run on the FirstRun, Monthly, and Quarterly routines, and is enabled by default from 2020.01 onward. WAM cannot back up a remote SQL database due to the limitations of the SQL CmdLine Tools. If you have a remote SQL database, a notification will be displayed on each report that runs this stream telling you that you should disable this option and have another method to back up the database such as an enterprise grade backup software that is SQL aware. If the backup stream is run more than once a day, subsequent backups append to the same file. This is done so that there is only 1 backup file per day.

Our Recommendation:

This should be left enabled unless it is a remote SQL database. The default location of backups is %ProgramData%\AJ Tek\WAM\Backups\ and can be adjusted in the configuration file if you wish it to be located elsewhere.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Initiate a SQL Database Backup – SaveReport TXT

```
.\Clean-WSUS.ps1 -SQLDatabaseBackup -SaveReport TXT
```

Example 2: Initiate a SQL Database Backup – SaveReport HTML

```
.\Clean-WSUS.ps1 -SQLDatabaseBackup -SaveReport HTML
```

Example 3: Initiate a SQL Database Backup – MailReport HTML

```
.\Clean-WSUS.ps1 -SQLDatabaseBackup -MailReport HTML
```

Example 4: Initiate a SQL Database Backup – MailReport TXT

```
.\Clean-WSUS.ps1 -SQLDatabaseBackup -MailReport TXT
```

Database Index Optimization Stream

This stream will add the necessary SQL indexes into the SUSDB database that make WSUS work about 1,000 to 1,500 times faster on many database operations, making your WSUS installation better than Microsoft defaults. If you are using Microsoft Configuration Manager (AKA SCCM/MECM/MEMCM) 1906 or higher, we recommend that you do **NOT** select the option to add the non-clustered indexes as WAM already does this for you (and more).

Our Recommendation:

This stream is only included in the -FirstRun routine and it will be run first to ensure WSUS runs in its most optimized levels.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Add the SQL Indexes to the SUSDB Database – SaveReport TXT

```
.\Clean-WSUS.ps1 -DatabaseIndexOptimization -SaveReport TXT
```

Example 2: Add the SQL Indexes to the SUSDB Database – SaveReport HTML

```
.\Clean-WSUS.ps1 -DatabaseIndexOptimization -SaveReport HTML
```

Example 3: Add the SQL Indexes to the SUSDB Database – MailReport HTML

```
.\Clean-WSUS.ps1 -DatabaseIndexOptimization -MailReport HTML
```

Example 4: Add the SQL Indexes to the SUSDB Database – MailReport TXT

```
.\Clean-WSUS.ps1 -DatabaseIndexOptimization -MailReport TXT
```

Example 5: Remove the SQL Indexes from the SUSDB Database – SaveReport TXT

```
.\Clean-WSUS.ps1 -RemoveDatabaseIndexOptimization -SaveReport TXT
```

Example 6: Remove the SQL Indexes from the SUSDB Database – SaveReport HTML

```
.\Clean-WSUS.ps1 -RemoveDatabaseIndexOptimization -SaveReport HTML
```

Example 7: Remove the SQL Indexes from the SUSDB Database – MailReport HTML

```
.\Clean-WSUS.ps1 -RemoveDatabaseIndexOptimization -MailReport HTML
```

Example 8: Remove the SQL Indexes from the SUSDB Database – MailReport TXT

```
.\Clean-WSUS.ps1 -RemoveDatabaseIndexOptimization -MailReport TXT
```

Remove WSUS Drivers Stream

This stream will remove drivers from the “Drivers” classification from the WSUS database. This has 2 possible running methods: 1. run through PowerShell where only the declined driver updates are removed or 2. run directly in SQL where all drivers are removed. The -FirstRun switch will force the SQL method, but all other automatic runs will use the PowerShell method.

Managing drivers in WSUS is unfortunately one of the more manual methods as driver updates rarely supersede other driver updates. There are some cases where Microsoft or the 3rd party driver company do include the supersedence flag, but it is rare in comparison to how many drivers are released monthly.

If you have the “Drivers” classification enabled initially, make sure that there are no ‘needed’ drivers by any of your computers before you install WAM. On the installation, all drivers will be removed, and only new drivers will be synced afterwards.

If you do not have the “Drivers” classification enabled but you wish to enable it, and you are already using WAM, here are the recommended steps to take:

1. Enable Drivers and perform the initial sync with Microsoft. Be patient as this may pull in tens of thousands of updates into the database.
2. [Using WSUS views](#), scope only drivers and make sure the selected Approval is set to Unapproved with a status of Failed or Needed. Approve your drivers to your systems.
3. Wait until your systems are up to date with drivers and then run from the WAM Shell:
`.\Clean-WSUS.ps1 -RemoveDriversSQL -SaveReport TXT`

Our Recommendation:

We recommend this be done every quarter.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Remove Drivers using SQL removing all drivers in the database – SaveReport TXT

```
.\Clean-WSUS.ps1 -RemoveDriversSQL -SaveReport TXT
```

Example 2: Remove Drivers using SQL removing all drivers in the database – SaveReport HTML

```
.\Clean-WSUS.ps1 -RemoveDriversSQL -SaveReport HTML
```

Example 3: Remove Drivers using SQL removing all drivers in the database – MailReport HTML

```
.\Clean-WSUS.ps1 -RemoveDriversSQL -MailReport HTML
```

Example 4: Remove Drivers using SQL removing all drivers in the database – MailReport TXT

```
.\Clean-WSUS.ps1 -RemoveDriversSQL -MailReport TXT
```

Example 5: Remove Drivers using PowerShell API removing only declined drivers – SaveReport TXT

```
.\Clean-WSUS.ps1 -RemoveDriversPS -SaveReport TXT
```

Example 6: Remove Drivers using PowerShell API removing only declined drivers – SaveReport HTML

```
.\Clean-WSUS.ps1 -RemoveDriversPS -SaveReport HTML
```

Example 7: Remove Drivers using PowerShell API removing only declined drivers – MailReport HTML

```
.\Clean-WSUS.ps1 -RemoveDriversPS -MailReport HTML
```

Example 8: Remove Drivers using PowerShell API removing only declined drivers – MailReport TXT

```
.\Clean-WSUS.ps1 -RemoveDriversPS -MailReport TXT
```

Remove Declined Updates Stream

This stream will remove any declined updates from the WSUS database using the WSUS PowerShell API that Microsoft wrote. This is good if you are removing specific products (Like Server 2003 / Windows XP updates) from the WSUS server under the Products and Classifications section. Since this will remove them from the database, if they are still valid, and you want them to re-appear, you will have to re-add them using 1 of 2 methods. Use the 'Import Update' option from within the WSUS Console to install specific updates through the Windows Catalog, or remove the product family, sync, re-select the product family, and then the next synchronizations will pick up the updates again, along with everything else in that product family.

A Note About the Resynchronization Issue:

Sometimes after removing the declined updates meta information from the database, a synchronization with Microsoft soon after will bring back all the updates it just removed. We do not know what is causing the re-sync of these updates and not everyone is experiencing it. For those that do, it is totally random in terms of time after the removal of the declined updates from the database (hours to days to weeks).

While the metadata of the updates flow back into the database, it doesn't take up that much space as it is data in the database, so it is fine to receive the metadata if you are not automatically approving updates. Automatic approvals are the number 1 reason why this issue affects WSUS systems, causing space issues.

Also, for those that have this issue, not everyone uses WAM, which is why we do not believe WAM is responsible for it directly. Microsoft representatives on TechNet have occasionally been recommending using this method to remove specific updates from the database. We have just expanded this code to allow it to dynamically remove declined updates. We know that there has been at least a couple of cases on TechNet where the user had never heard of WAM (or its predecessor Adamj Clean-WSUS), so they were not using the software, yet they also experienced the re-syncing of thousands of updates.

We are now looking at the larger picture and now trying to investigate the question of why this is happening. This is going to take time, and this may not be something that we can fix directly, and it may have to be escalated to Microsoft (when we have concrete data) and depending on how they prioritize it, it may not be fixed for a very long time after reporting, or even at all. We have therefore made a configuration variable (default enabled) that allows you to disable this stream.

Our Recommendation:

We recommend that this be done every quarter. This stream is NOT included on -FirstRun on purpose.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Remove Declined Updates metadata from the database – SaveReport TXT

```
.\Clean-WSUS.ps1 -RemoveDeclinedUpdates -SaveReport TXT
```

Example 2: Remove Declined Updates metadata from the database – SaveReport HTML

```
.\Clean-WSUS.ps1 -RemoveDeclinedUpdates -SaveReport HTML
```

Example 3: Remove Declined Updates metadata from the database – MailReport HTML

```
.\Clean-WSUS.ps1 -RemoveDeclinedUpdates -MailReport HTML
```

Example 4: Remove Declined Updates metadata from the database – MailReport TXT

```
.\Clean-WSUS.ps1 -RemoveDeclinedUpdates -MailReport TXT
```

Remove Obsolete Updates Stream

This stream will use SQL code to execute Microsoft's stored procedures that will return the update id of each obsolete update in the database and then remove it. This is important is because obsolete updates that have not been removed cause a strain on IIS from client requests, often resulting in the crashing the WSUS MMC console. Unfortunately, there is no magic number of obsolete updates that causes this strain on IIS. Running this stream initially can easily take from a couple of seconds to many hours, even days to delete the updates. If you need to restart the server at any time during the initial -FirstRun, you may do so and then restart -FirstRun from the WAM Shell and it will pick up where it left off, but you will lose the log of what it has already done. While the process is running you might see WSUS synchronization errors or Visual Studio's Just-In-Time (JIT) Debugger errors [An unhandled Microsoft .NET Framework exception occurred in w3wp.exe]. If you get the JIT errors, you can ignore them for now and at the end of -FirstRun you will want to use [Set-ApplicationPoolMemory](#) to increase your IIS private memory pool for the WsusPool.

If you want to check the progress of RemoveObsoleteUpdates, please contact our support department for detailed instructions.

Our Recommendation:

We recommend that this be done daily.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Remove Obsolete Updates from the database – SaveReport TXT

```
.\Clean-WSUS.ps1 -RemoveObsoleteUpdates -SaveReport TXT
```

Example 2: Remove Obsolete Updates from the database – SaveReport HTML

```
.\Clean-WSUS.ps1 -RemoveObsoleteUpdates -SaveReport HTML
```

Example 3: Remove Obsolete Updates from the database – MailReport HTML

```
.\Clean-WSUS.ps1 -RemoveObsoleteUpdates -MailReport HTML
```

Example 4: Remove Obsolete Updates from the database – MailReport TXT

```
.\Clean-WSUS.ps1 -RemoveObsoleteUpdates -MailReport TXT
```


Compress Update Revisions Stream

This stream will use SQL code to execute Microsoft's stored procedures that will return the update id of each update revision that needs compressing and then compress it.

Our Recommendation:

We recommend that this be done daily.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Compress Update Revisions – SaveReport TXT

```
.\Clean-WSUS.ps1 -CompressUpdateRevisions -SaveReport TXT
```

Example 2: Compress Update Revisions – SaveReport HTML

```
.\Clean-WSUS.ps1 -CompressUpdateRevisions -SaveReport HTML
```

Example 3: Compress Update Revisions – MailReport HTML

```
.\Clean-WSUS.ps1 -CompressUpdateRevisions -MailReport HTML
```

Example 4: Compress Update Revisions – MailReport TXT

```
.\Clean-WSUS.ps1 -CompressUpdateRevisions -MailReport TXT
```

Decline Multiple Types Of Updates Stream

This stream will decline multiple types of updates. This is configurable on a per-type basis for inclusion or exclusion when the stream is run and the frequency (daily or monthly).

List of Update Types

- | | | |
|--------------------------------|-----------------------------|----------------|
| 1. Superseded | 15. SharepointUpdates | 26. Win10_1511 |
| 2. SupersededDefinitionUpdates | 16. ComputerUpdates32bit | 27. Win10_1607 |
| 3. Expired | 17. Embedded | 28. Win10_1703 |
| 4. Preview ¹ | 18. ARM64 | 29. Win10_1709 |
| 5. Itanium | 19. WinXP | 30. Win10_1803 |
| 6. Beta | 20. Windows 7 | 31. Win10_1809 |
| 7. IE7 | 21. SecurityOnly | 32. Win10_1903 |
| 8. IE8 | 22. Microsoft_Office | 33. Win10_1909 |
| 9. IE9 | a. Selectable Versions | 34. Win10_2004 |
| 10. IE10 | b. Selectable Architecture | 35. Win10_20H2 |
| 11. Microsoft Edge (Stable) | [x86, x64, or Both] | 36. Win10_21H1 |
| 12. Microsoft Edge (Beta) | 23. ThirdParty | 37. Win10_21H2 |
| 13. Microsoft Edge (Dev) | 24. SpecificLanguageUpdates | 38. Win10_22H2 |
| 14. LanguagePacks | a. Selectable Languages | 39. Win11_21H2 |
| | 25. Win10_1507 | 40. Win11_22H2 |

A note about the default types of updates to be declined.

- Superseded: Decline updates that are superseded and not yet declined.
- Expired: Decline updates that have been pulled by Microsoft.
- Preview¹: Decline preview updates. Unfortunately, Microsoft used a word that has a bad connotation. Preview¹ updates are 100% tested and business ready updates that will be included in the next cumulative update. However, you can approve them if you need them as soon as possible as they fix an issue that you are having. In this case, set this option to \$False or change the frequency to monthly. Server 2016 does not have preview updates. Windows Server 2019 (after September 20, 2022), Windows Server 2022 (after November 22, 2022) will no longer have optional, non-security releases (known as "C" or preview releases) Only cumulative monthly security updates (known as the "B" or Update Tuesday release) will continue these systems.
- Itanium: Decline updates for Itanium computers.
- Beta: Decline updates for beta products and beta updates.

¹ From: <https://techcommunity.microsoft.com/t5/Windows-IT-Pro-Blog/Windows-10-update-servicing-cadence/ba-p/222376> - The "C" and "D" releases occur the third and fourth weeks of the month, respectively. These preview releases contain only non-security updates and are intended to provide (you) visibility and (your) testing of the planned non-security fixes targeted for the next month's Update Tuesday release. These updates are then shipped as part of the following month's "B" or Update (Patch) Tuesday release.

About Microsoft Office Declines

Instead of declining updates for all Microsoft Office versions, we have included a subsection configuration setting (\$AJTekDeclineMultipleTypesOfUpdatesOfficeCfg) for specifying what versions of Office you would like declined, the frequency of the declines, and what architectures to decline. For this subsection configuration to take effect, you must make sure you enable Microsoft_Office declines in the main Update Types configuration.

List of Microsoft Office Types

1. Office 2002/XP
2. Office 2003
3. Office 2003, Office 2007 (Some updates are released for both products)
4. Office 2007
5. Office 2010
6. Office 2013
7. Office 2016
8. Office 2019
9. Microsoft 365 Apps/Office 365 Client (formerly Office 365 Client)
10. Office LTSC

Each Microsoft Office Version can be controlled individually [Enabled, Disabled] with frequency [Daily, Monthly] and architecture [x86, x64, or Both] giving you ultimate control for your environment.

About Specific Language Declines

We have replaced the NonEnglishLanguage decline with a more configurable subsection configuration setting (\$AJTekDeclineMultipleTypesOfUpdatesLanguageDeclinesCfg) for specifying what languages you would like declined., the frequency of the declines, and what architectures to decline. For this subsection configuration to take effect, you must make sure you enable SpecificLanguageUpdates declines in the main Update Types configuration.

List of Specific Language Types

- | | |
|-----------------------------------|--|
| 1. Arabic (Saudi Arabia) (ar-SA) | 17. Japanese (Japan) (ja-JP) |
| 2. Bulgarian (Bulgaria) (bg-BG) | 18. Korean (Korea) (ko-KR) |
| 3. Czech (Czech Republic) (cs-CZ) | 19. Lithuanian (Lithuania) (lt-LT) |
| 4. Danish (Denmark) (da-DK) | 20. Latvian (Latvia) (lv-LV) |
| 5. German (Germany) (de-DE) | 21. Norwegian (Bokmal) (Norway) (nb-NO) |
| 6. Greek (Greece) (el-GR) | 22. Dutch (Netherlands) (nl-NL) |
| 7. Spanish (Spain) (es-ES) | 23. Polish (Poland) (pl-PL) |
| 8. Spanish (Mexico) (es-MX) | 24. Portuguese (Brazil) (pt-BR) |
| 9. Estonian (Estonia) (et-EE) | 25. Portuguese (Portugal) (pt-PT) |
| 10. Finnish (Finland) (fi-FI) | 26. Romanian (Romania) (ro-RO) |
| 11. French (Canada) (fr-CA) | 27. Russian (Russia) (ru-RU) |
| 12. French (France) (fr-FR) | 28. Slovak (Slovakia) (sk-SK) |
| 13. Hebrew (Israel) (he-IL) | 29. Slovenian (Slovenia) (sl-SI) |
| 14. Croatian (Croatia) (hr-HR) | 30. Serbian (Latin, Serbia) (sr-latn-rs) |
| 15. Hungarian (Hungary) (hu-HU) | 31. Swedish (Sweden) (sv-SE) |
| 16. Italian (Italy) (it-IT) | 32. Thai (Thailand) (th-TH) |

- 33. Turkish (Turkey) (tr-TR)
- 34. Ukrainian (Ukraine) (uk-UA)
- 35. Chinese (Simplified) (zh-CN)

- 36. Chinese (Hong Kong) (zh-HK)
- 37. Chinese (Traditional) (zh-TW)

Each language can be controlled individually [Enabled, Disabled] but will adhere to the single configured frequency [Daily, Monthly] under \$AJTekDeclineMultipleTypesOfUpdatesFrequency.

About Superseded Updates

This will be the biggest factor in shrinking down the size of your WSUS Server. Any update that has been superseded but has not been declined is using extra space. This will save you GB of data in your WsusContent folder. A superseding update is a complete replacement of a previous release update. The superseding update has everything that the superseded update has, but also includes new data that either fixes bugs, or includes something more.

The Server Cleanup Wizard (SCW) declines superseded updates, only if:

- The newest update is approved, and
- The superseded updates are Not Approved, and
- The superseded update has not been reported as NotInstalled (i.e., Needed) by any computer in the previous 30 days.

There has been a ‘best practice’ for years where declining superseded updates should only be done after the superseding update is approved and the superseded update has been installed on all systems. We at AJ Tek are looking to change that method of thinking into a blanket declining of superseded updates. If you think about it, there is no need to keep the superseded updates for that long. Once testing of the superseding update is complete, and you are choosing to approve the superseding update, there is no reason for the clients to continue installing the superseded update – they should go directly to the superseding update which is now approved.

If you are declining superseded updates, but you do not want to decline a superseded update until the update is superseded for a specific number of days (based on the creation date of the superseded update), you can alter the variable \$AJTekSupersededUpdateDeclineAfterDays.

About Superseded Definition Updates

This only applies to updates classified as “Definition Updates”. Superseded Definition Updates are disabled by default, unlike Superseded updates, and by default will execute daily.

Using Superseded Definition Updates allows you to create an accelerated cleanup schedule for definition updates (for example: daily cleanup of superseded Windows Defender definition updates).

Additionally, like Superseded updates, Superseded Definition Updates provides a separate variable (\$AJTekSupersededDefinitionUpdateDeclineAfterDays) to use for waiting a specific number of days before declining updates (again based on the creation date of the superseded update).

Our Recommendation:

We recommend that this stream be run every day and that the defaults of Preview and Beta be run daily while the defaults of Superseded, Expired, and Itanium be run monthly. Customization of all the other types is at the discretion of the WSUS Administrator and their environment.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Decline Multiple Types of Updates based on the WAM Configuration (Forced Decline) – SaveReport TXT

```
.\Clean-WSUS.ps1 -DeclineMultipleTypesOfUpdates -SaveReport TXT
```

Example 2: Decline Multiple Types of Updates based on the WAM Configuration (Forced Decline) – SaveReport HTML

```
.\Clean-WSUS.ps1 -DeclineMultipleTypesOfUpdates -SaveReport HTML
```

Example 3: Decline Multiple Types of Updates based on the WAM Configuration (Forced Decline) – MailReport HTML

```
.\Clean-WSUS.ps1 -DeclineMultipleTypesOfUpdates -MailReport HTML
```

Example 4: Decline Multiple Types of Updates based on the WAM Configuration (Forced Decline) – MailReport TXT

```
.\Clean-WSUS.ps1 -DeclineMultipleTypesOfUpdates -MailReport TXT
```

Remove Synchronization Logs Stream

This stream will remove all synchronization logs beyond a specified period. WSUS lacks the ability to remove synchronization logs through the GUI. Your WSUS server will become slower and slower loading up the synchronization logs view as the logs will just keep piling up over time. If you have your synchronization settings set to synchronize 4 times a day, it will take less than 3 months before you have over 300 logs that it must load for the view. This is very time consuming and many just ignore this view and rarely go to it. When they accidentally click on it, they curse. This is also one of the biggest causes of database bloat that can increase the SQL database size. Remember however, that removing data from the database does not actually shrink the physical size of the database files; it only increases the whitespace within the database. Our [SQL Database Shrink Stream](#) takes care of that.

Our Recommendation:

We recommend that this be done daily.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Remove the Synchronization Logs from the database – SaveReport TXT

```
.\Clean-WSUS.ps1 -RemoveSynchronizationLogs -SaveReport TXT
```

Example 2: Remove the Synchronization Logs from the database – SaveReport HTML

```
.\Clean-WSUS.ps1 -RemoveSynchronizationLogs -SaveReport HTML
```

Example 3: Remove the Synchronization Logs from the database – MailReport HTML

```
.\Clean-WSUS.ps1 -RemoveSynchronizationLogs -MailReport HTML
```

Example 4: Remove the Synchronization Logs from the database – MailReport TXT

```
.\Clean-WSUS.ps1 -RemoveSynchronizationLogs -MailReport TXT
```

Display Newly Added Products Stream

If you are interested in keeping track of what new products and/or classifications have been added to WSUS, we have included a stream that will include this information in the WAM report. You can configure the stream to include both products and classifications individually or both together. You can also individually configure the limit on the maximum number of days that a type is deemed “new”.

For example, if you only wanted to see what products were added within the last 14 days, but also want to see what classifications have been added in the past 31 days.

Our Recommendation:

We recommend running this stream monthly to keep up to date with new products and new classifications.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Display Newly Added Products & Classifications – SaveReport TXT

```
.\Clean-WSUS.ps1 -DisplayNewlyAddedProducts -SaveReport TXT
```

Example 2: Display Newly Added Products & Classifications – SaveReport HTML

```
.\Clean-WSUS.ps1 -DisplayNewlyAddedProducts -SaveReport HTML
```

Example 3: Display Newly Added Products & Classifications – MailReport HTML

```
.\Clean-WSUS.ps1 -DisplayNewlyAddedProducts -MailReport HTML
```

Example 4: Display Newly Added Products & Classifications – MailReport TXT

```
.\Clean-WSUS.ps1 -DisplayNewlyAddedProducts -MailReport TXT
```

Prune IIS Logs Stream

With servers that have enabled logging in IIS you may find that the WSUS IIS site generates a lot of excess logging which likely will not be useful once a week or two has passed. There are a few different ways to go about solving this, but we have opted to include a stream to help solve this issue without extra work.

The Prune IIS Logs Stream will delete all log files (that is, files ending with .log) found in the logging folder for the WSUS IIS site. By default, the stream will remove log files older than 2 weeks. Files are checked based on the date they were last modified, not the created date.

Our Recommendation:

We recommend running this stream monthly if you have manually enabled IIS Logging. This stream is disabled by default as most installations do not have IIS Logging enabled.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Prune the IIS Logs – SaveReport TXT

```
.\Clean-WSUS.ps1 -PruneIISLogs -SaveReport TXT
```

Example 2: Prune the IIS Logs – SaveReport HTML

```
.\Clean-WSUS.ps1 -PruneIISLogs -SaveReport HTML
```

Example 3: Prune the IIS Logs – MailReport HTML

```
.\Clean-WSUS.ps1 -PruneIISLogs -MailReport HTML
```

Example 4: Prune the IIS Logs – MailReport TXT

```
.\Clean-WSUS.ps1 -PruneIISLogs -MailReport TXT
```


Remove Computer Objects Stream

This stream will find all computers that have not **contacted** the server within a certain period and remove them. This is usually done through the Server Cleanup Wizard (SCW), however the SCW has been hardcoded to 30 days. We have setup this stream to be configurable. You can also tell it not to remove any computer objects if you really want to. The default is 30 days.

By default, downstream computers are included in the Remove Computer Objects stream search, but this setting can be adjusted by setting the \$AJTekRemoveComputerObjectsIncludeDownstreamComputers variable to \$False.

We have also added some information of what systems have been removed including the full name of the system, the time the computer last reported to WSUS, the OS description, and the raw operating system version number. This will help in identifying systems that have been removed that should not have for the administrator to go and investigate.

Remember, “Last Status Report” and “Last Contact” are 2 different columns, and the Last Contact column is hidden by default.

Our Recommendation:

We recommend that this be done daily.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Remove Computer Objects – SaveReport TXT

```
.\Clean-WSUS.ps1 -RemoveComputerObjects -SaveReport TXT
```

Example 2: Remove Computer Objects – SaveReport HTML

```
.\Clean-WSUS.ps1 -RemoveComputerObjects -SaveReport HTML
```

Example 3: Remove Computer Objects – MailReport HTML

```
.\Clean-WSUS.ps1 -RemoveComputerObjects -MailReport HTML
```

Example 4: Remove Computer Objects – MailReport TXT

```
.\Clean-WSUS.ps1 -RemoveComputerObjects -MailReport TXT
```

Rename OS Descriptions Stream

This stream will rename the operating system descriptions of client systems to something that is based on their editions and versions. This will rename Windows 10, Windows 11, Server 2008 R2, Server 2012, Server 2012 R2, Server 2016, Server 2019, and Server 2022.

- Windows 10 Home
- Windows 10 Pro
- Windows 10 Pro N
- Windows 10 Pro for Workstations
- Windows 10 Pro N for Workstations
- Windows 10 Enterprise
- Windows 10 Enterprise (Evaluation)
- Windows 10 Enterprise N
- Windows 10 Enterprise N LTSC/LTSC OS descriptions
- Windows 10 Enterprise LTSC/LTSC
- Windows 10 Enterprise LTSC/LTSC Evaluation
- Windows 10 IoT Enterprise LTSC
- Windows 10 Education
- Windows 10 Education N
- Windows 10 Pro Education
- Windows 10 Pro N Education
- Windows 11 Home
- Windows 11 Pro
- Windows 11 Pro N
- Windows 11 Pro for Workstations
- Windows 11 Pro N for Workstations
- Windows 11 Enterprise
- Windows 11 Enterprise (Evaluation)
- Windows 11 Enterprise N
- Windows 11 Enterprise LTSC/LTSC
- Windows 11 IoT Enterprise LTSC
- Windows 11 Education
- Windows 11 Education N
- Windows 11 Pro Education
- Windows 11 Pro N Education
- Windows Server 2008 R2 Standard
- Windows Server 2008 R2 Datacenter
- Windows Server 2012 Standard
- Windows Server 2012 Datacenter
- Windows Server 2012 R2 Standard
- Windows Server 2012 R2 Datacenter
- Windows Server 2016 Essentials
- Windows Server 2016 Standard
- Windows Server 2016 Datacenter
- Windows Server 2019 Essentials
- Windows Server 2019 Standard
- Windows Server 2019 Standard Evaluation
- Windows Server 2019 Datacenter
- Windows Server 2022 Standard
- Windows Server 2022 Standard Evaluation
- Windows Server 2022 Datacenter
- Microsoft Hyper-V Server 2016
- Microsoft Hyper-V Server 2019

Windows 7, 8, and 8.1 systems should appear properly in the WSUS Console, so they are not included in this stream.

This stream will only rename needed client systems on each run. It will also provide feedback as to what the client system was named before, and what it has been changed to. You will notice that each individual system may be renamed often. This is because clients that are reporting back to WSUS will clear this field and WAM will put it back.

For a proactive development approach, Adam had discussed version number and naming convention prediction options with a fellow MVP (a Windows Insider MVP) who has been in the room when the developers at Microsoft have “pressed the button” to deploy a new version of Windows 10/11 to general deployment release (GDR). Unfortunately, the result is that the version numbers are not

possible to predict (although we still try) and can only be confirmed after the official release of the next version of Windows. As such, we created a catchall that if the version was not detected as a known version, it would be renamed Windows 10 Pro NEXT, Windows 11 Pro Next, Windows 10 Pro for Workstation NEXT, etc.

You can use -GetOSDescriptionsData from the WAM Shell to output all detailed data on each of your client systems for analysis to get a more accurate description. This is often used when requesting support if something is not being recognized correctly or WAM is missing a description for one of your systems. You can also use -ResetOSDescriptionsToNull to reset all OS Descriptions to their default (NULL) value.

As of WAM 2022.07 you can now remove the SQL output of Rename OS Descriptions from WAM's reports by setting \$AJTekRenameOSDescriptionsIncludeOutput to \$False.

Our Recommendation:

We recommend that this be done daily.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Rename OS Descriptions – SaveReport TXT

```
.\Clean-WSUS.ps1 -RenameOSDescriptions -SaveReport TXT
```

Example 2: Rename OS Descriptions – SaveReport HTML

```
.\Clean-WSUS.ps1 -RenameOSDescriptions -SaveReport HTML
```

Example 3: Rename OS Descriptions – MailReport HTML

```
.\Clean-WSUS.ps1 -RenameOSDescriptions -MailReport HTML
```

Example 4: Rename OS Descriptions – MailReport TXT

```
.\Clean-WSUS.ps1 -RenameOSDescriptions -MailReport TXT
```

Example 5: Reset all OS Descriptions to defaults (NULL) – SaveReport TXT

```
.\Clean-WSUS.ps1 -ResetOSDescriptionsToNull -SaveReport TXT
```

Example 6: Rename OS Descriptions – SaveReport TXT

```
.\Clean-WSUS.ps1 -GetOSDescriptionsData -SaveReport TXT
```

Database Maintenance Stream

This stream will perform basic maintenance tasks on SUSDB, the WSUS database. It will identify indexes that are fragmented and defragment them. For certain tables, a fill-factor is set to improve insert performance. It will then update potentially out-of-date table statistics.

Note: If you are seeing BIG BLANK spaces within WAM's reports within this stream, it is because the database maintenance is executing the `sp_updatestats` stored procedure. According to [Microsoft's Documentation](#), this stored procedure must be executed as **THE** dbo, not just be a member of the role db_owner. If you have changed the DBO on the SUSDB database, change the DBO to the user account that is executing WAM and this should now execute.

Our Recommendation:

We recommend that this be done daily.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Run the Database Maintenance – SaveReport TXT

```
.\Clean-WSUS.ps1 -DatabaseMaintenance -SaveReport TXT
```

Example 2: Run the Database Maintenance – SaveReport HTML

```
.\Clean-WSUS.ps1 -DatabaseMaintenance -SaveReport HTML
```

Example 3: Run the Database Maintenance – MailReport HTML

```
.\Clean-WSUS.ps1 -DatabaseMaintenance -MailReport HTML
```

Example 4: Run the Database Maintenance – MailReport TXT

```
.\Clean-WSUS.ps1 -DatabaseMaintenance -MailReport TXT
```

SQL Database Shrink Stream

You might be aware that databases can be configured with an AUTOSHRINK setting. This is usually not a good thing to enable. Shrinking is an expensive process - CPU, I/O, logging, blocking – all these things increase during a shrink operation. If you need to shrink your database, you want to control it.

This stream will perform a recurring database shrink until the size of the database can no longer shrink – it basically says to rearrange all the pages in the file until all the free space is at the end, then truncate the file at that point. This would normally be such an expensive process, but we are doing it in multiple stages, with a delay in-between so that it does not lock up the database for a very long time.

The defaults will attempt to shrink the database by 30%, wait for 1 second once completed (to release blocking processes and allow them to run) and then repeat until the database has been reduced to the minimum size it can be.

The percentage [0-100], wait interval [greater or equal to 1 second], and running frequency [Quarterly, or Monthly] are all configurable if you find that the defaults are not meeting your needs.

Our Recommendation:

We recommend that this be done quarterly.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Run the SQL Database Shrink – SaveReport TXT

```
.\Clean-WSUS.ps1 -SQLDatabaseShrink -SaveReport TXT
```

Example 2: Run the SQL Database Shrink – SaveReport HTML

```
.\Clean-WSUS.ps1 -SQLDatabaseShrink -SaveReport HTML
```

Example 3: Run the SQL Database Shrink – MailReport HTML

```
.\Clean-WSUS.ps1 -SQLDatabaseShrink -MailReport HTML
```

Example 4: Run the SQL Database Shrink – MailReport TXT

```
.\Clean-WSUS.ps1 -SQLDatabaseShrink -MailReport TXT
```

Server Cleanup Wizard Stream

The Server Cleanup Wizard (SCW) is integrated into the WSUS GUI and can be used to help you manage your disk space. WAM runs the SCW through PowerShell APIs which have the bonus ability of not timing out as often as the SCW GUI would.

The SCW can do the following things:

- **Remove unused updates and update revisions**
The wizard will remove all older updates and update revisions that have not been approved.
- **Delete computers not contacting the server**
The wizard will delete all client computers that have not contacted the server in thirty days or more. This is DISABLED by default as the Computer Object Cleanup Stream takes care of this in a more configurable method.
- **Delete unneeded update files**
The wizard will delete all update files that are not needed by updates or by downstream servers.
- **Decline expired updates**
The wizard will decline all updates that have been expired by Microsoft.
- **Decline superseded updates**
The wizard will decline all updates that meet all the following criteria:
 - The superseded update is not mandatory.
 - The superseded update has been on the server for thirty days or more.
 - The superseded update is not currently reported as needed by any client.
 - The superseded update has not been explicitly deployed to a computer group for ninety days or more.
 - The superseding update must be approved for install to a computer group.

When using WAM, all the software's streams perform compression and removal tasks prior to the SCW being run. Therefore, except for DiskSpaceFreed, all the other fields of the SCW will usually return 0 but may on occasion return a number.

Our Recommendation:

We recommend that this be run daily.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Run the Server Cleanup Wizard (SCW) – SaveReport TXT

```
.\Clean-WSUS.ps1 -ServerCleanupWizard -SaveReport TXT
```

Example 2: Run the Server Cleanup Wizard (SCW) – SaveReport HTML

```
.\Clean-WSUS.ps1 -ServerCleanupWizard -SaveReport HTML
```

Example 3: Run the Server Cleanup Wizard (SCW) – MailReport HTML

```
.\Clean-WSUS.ps1 -ServerCleanupWizard -MailReport HTML
```

Example 4: Run the Server Cleanup Wizard (SCW) – MailReport TXT

```
.\Clean-WSUS.ps1 -ServerCleanupWizard -MailReport TXT
```

Install Task Stream

The Install Task stream creates a scheduled task in the Task Scheduler to execute WAM, and ensures WAM has the appropriate permissions in the WSUS SQL server if the WSUS SQL server is a remote SQL server. It is important to note that **when a service account is not being used to run WAM, WAM will execute as the NT AUTHORITY\SYSTEM account**. The Install Task stream should not need to be run frequently and is only set to run on -FirstRun at the end.

If any changes are needed for this task, it is highly recommended you use WAM's Install Task stream to reconfigure the task after modifying the appropriate variables in WAM's configuration. **Any manual modifications to the task will be lost on subsequent runs of the Install Task stream (including another -FirstRun if requested by Support).**

Install Task may need to be run in the following situations:

- **WAM has been configured to use/not use a service account**
After changing whether WAM is to use/not use a service account the Install Task stream should be run again to ensure the service account is the account being used to execute WAM's scheduled task. Install Task will also ensure that the service account has the appropriate permissions on the WSUS SQL server if the WSUS SQL server is a remote SQL server.
- **WAM's scheduled task execution time has changed**
Modifying the variable in WAM's configuration is not enough. The task in Task Scheduler needs to be updated to reflect the changed time.

Our Recommendation:

The task installation stream should generally not need to be run manually unless a configuration has changed. -FirstRun takes care of the initial installation of the scheduled task.

WAM Shell Syntax Examples

To run this manually from the WAM Shell.

Example 1: Run the Install Task stream to (re-)create the WAM scheduled task and save its report as a TXT file

```
.\Clean-WSUS.ps1 -InstallTask -SaveReport TXT
```

Example 2: Run the Install Task stream to (re-)create the WAM scheduled task and save its report as a HTML file

```
.\Clean-WSUS.ps1 -InstallTask -SaveReport HTML
```


WAM Utilities & The WAM Shell

To aid administrators we have developed a few utilities for adjusting certain WSUS settings, which are especially convenient for WSUS installs on servers that lack a graphical user interface. We have redesigned the WAM Shell to expose the utility Cmdlets that we have written to adjust your WSUS environment.

As the WAM Shell has expanded, we have included an easy method to identify and list all the different possible commands that can be used within the WAM Shell.

Get-WAMCommand

```
Get-WAMCommand
    [-ArgumentList <Object[]>]
    [-Name <String[]>]
    [-ParameterName <String[]>]
    [<CommonParameters>]
```

```
Get-WAMCommand
    [-ArgumentList <Object[]>]
    [-Noun <String[]>]
    [-ParameterName <String[]>]
    [<CommonParameters>]
```

Description

The Get-WAMCommand command helps you explore other WAM commands while inside the WAM Shell. Think of it as a mini version of Get-Command, but only for commands that the WAMTools module introduces. Similarly, some parameters you can use with Get-Command (e.g.: ArgumentList, ParameterName) can also be used with Get-WAMCommand.

Examples

Example 1: Find all WAM commands that start with “Get”.

```
Get-WAMCommand -Name "Get*"
```

Example 2: Find all WAM commands that modify the queueLength setting for WSUS.

```
Get-WAMCommand -Name "*QueueLength*"
```

Example 3: Find all WAM commands that use the noun “ApplicationPoolMemory”.

```
Get-WAMCommand -Noun "ApplicationPoolMemory"
```

Dirty Database Check Stream (Deprecated)

From a similar phrase from the movie 'Sleeping with Other People', we coined this stream the Dirty Database Check. This stream will run a SQL query that originally came from Microsoft. This SQL query checks to see if your database is 'in a bad state' which is Microsoft's wording, but we think ours sounds a whole lot more fun 😊. In addition to checking to see if you have a dirty database, it will fully fix your database automatically if it is found to be dirty. This again follows Microsoft's methods. If your upgrades for Windows 10 are not installing properly and have been approved on your WSUS server, run this check to see if you have a dirty database and subsequently fix it.

Our Recommendation:

We recommend that this be done manually from the WAM Shell if you suspect that you may have a dirty database. Note: Microsoft changed the way they packaged upgrades since 1709 for the better, but it renders this stream obsolete as it will always claim the database is dirty. It is left in the software on purpose for manual running if you suspect that you have a dirty database. It may be brought back in later with more functionality because we like the name of it.

WAM Shell Syntax:

To run this manually from the WAM Shell.

```
.\Clean-WSUS.ps1 -DirtyDatabaseCheck
```

Get-ApplicationPoolMemory

```
Get-ApplicationPoolMemory  
    [-Name] <String[]>  
    [<CommonParameters>]
```

Description

Why does the WSUS Application pool crash and how can we fix it? The WSUS Application pool has a "private memory limit" setting that is configured by default to a low number (1.8GB). The Application pool crashes because it cannot keep up and the limit is reached. So why couldn't the WSUS Application pool keep up? This has to do with the larger number of updates in the Update Catalog (database) which continues to grow over time. WSUS does not handle an excessive number of updates well, and as the number increases, the load on the application pool increases causing it to slowly run out of memory until the limit is hit and WSUS crashes. We have seen it start having issues above the low number of 10,000 updates and above the high number of 100,000 updates. The number of updates can in part be due to obsolete updates that remain in the database, and it varies in every system and implementation.

Examples

Example 1: Get the current memory limit for the WsusPool Application Pool in IIS

```
Get-ApplicationPoolMemory -Name WsusPool
```

Example 2: Get the current memory limit for the DefaultAppPool Application Pool in IIS

```
Get-ApplicationPoolMemory -Name DefaultAppPool
```

Set-ApplicationPoolMemory

```
Set-ApplicationPoolMemory  
    [-Name] <String[]>  
    [-NewMemoryValue <Int[]>]  
    [<CommonParameters>]
```

Description

To increase the memory on the WSUS Application Pool, we recommend setting a minimum of 4096 (in megabytes) and then increasing in groups of 4096 MB. If you want to give it an unlimited amount of memory, set the private memory limit to 0.

This will then restart the application pool for the changes to immediately become effective.

Examples

Example 1: Set the WsusPool Application Pool Memory to 4096 MB (4GB)

```
Set-ApplicationPoolMemory -Name WsusPool -NewMemoryValue 4096
```

Example 2: Set the WsusPool Application Pool Memory to 8192 MB (8GB)

```
Set-ApplicationPoolMemory -Name WsusPool -NewMemoryValue 8192
```

Example 3: Set the WsusPool Application Pool Memory to Unlimited Memory (0MB)

```
Set-ApplicationPoolMemory -Name WsusPool -NewMemoryValue 0
```

Get-SchUseStrongCrypto

Get-SchUseStrongCrypto
[<CommonParameters>]

Description

WSUS uses the .NET Framework and the .NET Framework 4.5.2 and earlier versions do not default to using strong TLS security when communicating. We should enable strong TLS security using the SchUseStrongCrypto. The strong cryptography uses more secure network protocols (TLS 1.2, TLS 1.1, and TLS 1.0) and blocks protocols that are not secure. Setting this value to 1 disables the RC4 stream cipher and requires a restart to take effect.

0 = Disabled

1 = Enabled

Examples

Example 1: Get information about the status of SchUseStrongCrypto

```
Get-SchUseStrongCrypto
```

Set-SchUseStrongCrypto

```
Set-SchUseStrongCrypto  
[-Value <Int[]>]  
[<CommonParameters>]
```

Description

WSUS uses the .NET Framework and the .NET Framework 4.5.2 and earlier versions do not default to using strong TLS security when communicating. We should enable strong TLS security using the SchUseStrongCrypto. The strong cryptography uses more secure network protocols (TLS 1.2, TLS 1.1, and TLS 1.0) and blocks protocols that are not secure. Setting this value to 1 disables the RC4 stream cipher and requires a restart to take effect.

Examples

Example 1: Set SchUseStrongCrypto to 1 (Enabled)

```
Set-SchUseStrongCrypto -Value 1
```

Example 2: Set SchUseStrongCrypto to 0 (Disabled)

```
Set-SchUseStrongCrypto -Value 0
```

Get-WsusIISLimitInterval

```
Get-WsusIISLimitInterval  
[<CommonParameters>]
```

Description

This retrieves the reset period (in minutes) for CPU monitoring and throttling limits on the WsusPool Application Pool. When the number of minutes elapsed since the last process accounting reset equals the number specified by this property, IIS resets the CPU timers for both the logging and limit intervals.

This will change the WsusPool limit interval (also called reset interval) setting in the IIS server. The setting is used with other settings to control CPU monitoring and throttling limits, and you can find more information about it [here](#) on MSDN.

Examples

Example 1: Get information about the WsusPool Limit Interval period

```
Get-WsusIISLimitInterval
```

Set-WsusIISLimitInterval

```
Set-WsusIISLimitInterval  
[-Minutes <Int[]>]  
[<CommonParameters>]
```

Description

This will change the WsusPool Application Pool limit interval (also called reset interval) setting in the IIS server. The setting is used with other settings to control CPU monitoring and throttling limits, and you can find more information about it [here](#) on MSDN. The WsusPool defaults to 5 minutes which is too short, and we recommend increasing this to 15 minutes.

Examples

Example 1: Set the WsusPool Application Pool Limit Interval to 15 minutes.

```
Set-WsusIISLimitInterval -Minutes 15
```

Example 2: Set the WsusPool Application Pool Limit Interval to 5 minutes.

```
Set-WsusIISLimitInterval -Minutes 5
```

Example 3: Set the WsusPool Application Pool Limit Interval to 0 minutes, disabling CPU monitoring.

```
Set-WsusIISLimitInterval -Minutes 0
```


Get-WsusIISQueueLength

Get-WsusIISQueueLength
[<CommonParameters>]

Description

Gets the maximum number of requests to queue in the WsusPool application pool before rejecting requests. When the maximum number of requests in the queue has been reached, the service returns an out-of-service message (503: Service Unavailable) to any additional requests to the current application pool.

Examples

Example 1: Get information about the WsusPool Queue Length

```
Get-WsusIISQueueLength
```

Set-WsusIISQueueLength

```
Set-WsusIISQueueLength  
    [-QueueLength <Int[]>]  
    [<CommonParameters>]
```

Description

Sets the maximum number of requests to queue in the WsusPool application pool before rejecting requests. When the maximum number of requests in the queue has been reached, the service returns an out-of-service message (503: Service Unavailable) to any additional requests to the current application pool.

The queue length must be at least 10 and must not exceed 65535.

Examples

Example 1: Set the WsusPool Application Pool Queue Length to 25,000.

```
Set-WsusIISQueueLength -QueueLength 25000
```

Example 2: Set the WsusPool Application Pool Queue Length to 2,000.

```
Set-WsusIISQueueLength -QueueLength 2000
```

Example 3: Set the WsusPool Application Pool Queue Length to 1,000.

```
Set-WsusIISQueueLength -QueueLength 1000
```

Get-WsusWebExecutionTimeout

Get-WsusWebExecutionTimeout
[<CommonParameters>]

Description

This will get the ExecutionTimeout property which indicates the maximum number of seconds a page request is allowed to execute before being automatically shut down by ASP.NET. The default is 110 seconds.

Examples

Example 1: Get information about the WsusPool Application Pool ExecutionTimeout Property

```
Get-WsusWebExecutionTimeout
```

Set-WsusWebExecutionTimeout

```
Set-WsusWebExecutionTimeout  
[-TimeoutInSeconds <Int[]>]  
[<CommonParameters>]
```

Description

This will set the ExecutionTimeout property to a new value which indicates the maximum number of seconds a page request is allowed to execute before being automatically shut down by ASP.NET. The default is 110 seconds which is too short, and we recommend changing it to 7200 seconds.

Examples

Example 1: Set the WsusPool Application Pool ExecutionTimeout to 110 seconds (1m & 50s).

```
Set-WsusWebExecutionTimeout -TimeoutInSeconds 110
```

Example 2: Set the WsusPool Application Pool ExecutionTimeout to 7200 seconds (2 hours).

```
Set-WsusWebExecutionTimeout -TimeoutInSeconds 7200
```

Example 3: Set the WsusPool Application Pool ExecutionTimeout to 3000 seconds (50 minutes).

```
Set-WsusWebExecutionTimeout -TimeoutInSeconds 3000
```

Get-WSusWebMaxRequestLength

Get-WSusWebMaxRequestLength
[<CommonParameters>]

Description

The MaxRequestLength property specifies the limit for the buffering threshold of the input stream. For example, this limit can be used to prevent denial of service attacks that are caused by users who post large files to the server. The default size is 4096 KB (4 MB).

Examples

Example 1: Get the current IIS Max Request Length for the WSUS Website.

```
Get-WSusWebMaxRequestLength
```

Set-WsusWebMaxRequestLength

```
Get-WsusWebMaxRequestLength  
[-MaxRequestLength <Int[]>]  
[<CommonParameters>]
```

Description

WSUS Web Max Request Length is used to change the maximum request length setting in the IIS server for the WSUS website. The setting is used to determine the maximum request size – in kilobytes – that a page request can be. The default is 4096KB (4MB) which is now too small for WSUS, and we recommend this be set to 204800 KB (200 MB).

Examples

Example 1: Set the WSUS Website Max Request Length to 204800 KB (200 MB).

```
Set-WsusWebMaxRequestLength -MaxRequestLength 204800
```

Example 2: Set the WSUS Website Max Request Length to 10240 KB (10 MB).

```
Set-WsusWebMaxRequestLength -MaxRequestLength 10240
```

Example 3: Set the WSUS Website Max Request Length to 4096 KB (4 MB).

```
Set-WsusWebMaxRequestLength -MaxRequestLength 4096
```

Get-WsusIISLoadBalancerCapabilities

Get-WsusIISLoadBalancerCapabilities
[<CommonParameters>]

Description

This property specifies behavior when a worker process cannot be started (for example, when the request queue is full, or an application pool is in rapid-fail protection). The default is `HttpLevel`.

| VALUE | DESCRIPTION |
|------------------|--|
| HttpLevel | 2 An HTTP 503 error code should be sent when a Web service is unavailable. |
| TcpLevel | 1 The connection of the ApplicationPoolFailure should be dropped at Layer 3 (TCP level) when a Web service is unavailable. |

Examples

Example 1: Get the current LoadBalancerCapabilities setting for the WSUS Website.

```
Get-WsusIISLoadBalancerCapabilities
```

Set-WsusIISLoadBalancerCapabilities

```
Set-WsusIISLoadBalancerCapabilities  
[-Level <String[] HttpLevel, TcpLevel>]  
[<CommonParameters>]
```

Description

This property specifies behavior when a worker process cannot be started (for example, when the request queue is full, or an application pool is in rapid-fail protection). The default is `HttpLevel` which will deliver a 503 error code for any client systems requesting connection with WSUS. It is therefore recommended to change this to `TcpLevel` to force the connection to drop, rather than return an error.

| VALUE | DESCRIPTION |
|------------------|--|
| HttpLevel | 2 An HTTP 503 error code should be sent when a Web service is unavailable. |
| TcpLevel | 1 The connection of the ApplicationPoolFailure should be dropped at Layer 3 (TCP level) when a Web service is unavailable. |

Examples

Example 1: Set the WSUS Website LoadBalancerCapabilities property to TcpLevel.

```
Set-WsusIISLoadBalancerCapabilities -Level TcpLevel
```

Example 2: Set the WSUS Website LoadBalancerCapabilities property to HttpLevel.

```
Set-WsusIISLoadBalancerCapabilities -Level HttpLevel
```


Get-WsusIISMaxCachedUpdates

Get-WsusIISMaxCachedUpdates
[<CommonParameters>]

Description

This property controls the maximum number of update IDs (the “maxCachedUpdates” property) that can be passed to several internal WSUS functions, and an InvalidParameters exception is thrown if its limit is exceeded. The default value is 22000.

Examples

Example 1: Get the current maxCachedUpdates setting for WSUS.

```
Get-WsusIISMaxCachedUpdates
```

Set-WsusIISMaxCachedUpdates

```
Set-WsusIISMaxCachedUpdates  
[-MaxCachedUpdates] <Int32>  
[<CommonParameters>]
```

Description

This property controls the maximum number of update IDs (the “maxCachedUpdates” property) that can be passed to several internal WSUS functions, and an InvalidParameters exception is thrown if its limit is exceeded. The default value is 22000, which in some cases requires modification when more need to be passed, for example in the case of receiving error 80244007 ([80244007] SyncUpdates_WithRecovery failed) in the Windows Update log.

Examples

Example 1: Increase the maxCachedUpdates setting for WSUS to double its default value.

```
Set-WsusIISMaxCachedUpdates -MaxCachedUpdates 44000
```

Example 2: Reset the maxCachedUpdates setting for WSUS back to its default value.

```
Set-WsusIISMaxCachedUpdates -MaxCachedUpdates 22000
```

Get-WsusIISMaxInstalledPrerequisites

Get-WsusIISMaxInstalledPrerequisites
[<CommonParameters>]

Description

This property controls the maximum number of installed prerequisites (the “maxInstalledPrerequisites” property) that can be passed to several internal WSUS functions, and an InvalidParameters exception is thrown if its limit is exceeded. The default value is 400.

Examples

Example 1: Get the current maxInstalledPrerequisites setting for WSUS.

```
Get-WsusIISMaxInstalledPrerequisites
```

Set-WsusIISMaxInstalledPrerequisites

```
Set-WsusIISMaxInstalledPrerequisites  
[-MaxInstalledPrerequisites] <Int32>  
[<CommonParameters>]
```

Description

This property controls the maximum number of installed prerequisites (the “maxInstalledPrerequisites” property) that can be passed to several internal WSUS functions, and an InvalidParameters exception is thrown if its limit is exceeded. The default value is 400, which in some cases requires modification when more need to be passed, for example in the case of receiving error 80244007 ([80244007] SyncUpdates_WithRecovery failed) in the Windows Update log.

Examples

Example 1: Increase the maxInstalledPrerequisites setting for WSUS to double its default value.

```
Set-WsusIISMaxInstalledPrerequisites -MaxInstalledPrerequisites 800
```

Example 2: Reset the maxInstalledPrerequisites setting for WSUS back to its default value.

```
Set-WsusIISMaxInstalledPrerequisites -MaxInstalledPrerequisites 400
```

Add-ESDMimetype

```
Add-ESDMimetype  
[-MimeTypeValue] <String[]>  
[<CommonParameters>]
```

Description:

Windows 10 Upgrades use a special format for distribution which is the .esd file format. Server 2012 does not have a reference for this format so a MimeType must be added to IIS to allow the clients to know how to access and download the Windows 10 Upgrade files. The MimeType needs to be set to “application/octet-stream” for the ESD files to be downloaded and used properly. For Windows Server 2016+, Microsoft defaults this MimeType value to defaults to “application/vnd.ms-cab-compressed” which CAN be used, however in many cases, it too creates an error for the client system. We have found that the best MimeType value for .esd files is the “application/octet-stream”. Without any arguments, it defaults to “application/octet-stream”.

Examples

Example 1: Add the .esd MimeType to the root level in IIS as “application/octet-stream”.

```
Add-ESDMimetype
```

Example 2: Add the .esd MimeType to the root level in IIS as “application/octet-stream”.

```
Add-ESDMimetype -MimeTypeValue application/octet-stream
```

Example 3: Add the .esd MimeType to the root level in IIS as “application/vnd.ms-cab-compressed”.

```
Add-ESDMimetype -MimeTypeValue application/vnd.ms-cab-compressed
```

Reset-ESDMimetype

Reset-ESDMimetype
[<CommonParameters>]

Description:

Sometimes you want to reset or revert the .esd MimeType back to what it used to be. Since we know the defaults for Server 2012 (none), and Server 2016+ (application/vnd.ms-cab-compressed), we have devised a quick way for you to revert to the Microsoft Defaults.

Examples

Example 1: Reset the .esd MimeType back to the Operating System's default.

Reset-ESDMimetype

Remove-ESDMimetype

Remove-ESDMimetype
[<CommonParameters>]

Description:

Sometimes you want to remove the .esd MimeType from the root level in IIS. We have made an easy way to do this.

Examples

Example 1: Remove the .esd MimeType from the root level IIS Configuration.

Remove-ESDMimetype

Get-WsusIISIdleTimeout

```
Get-WsusIISIdleTimeout  
[<CommonParameters>]
```

Description

This setting specifies how long a worker process should run idle if no new requests are received and the worker isn't processing any requests. After the idle time-out time passes, the worker process requests to be shut down. A value of 0 disables this time-out. The default value is 20 (minutes).

Examples

Example 1: Get information about the WSUS Application Pool's idle time-out setting.

```
Get-WsusIISIdleTimeout
```


Set-WsusIISIdleTimeout

```
Set-WsusIISIdleTimeout  
    [-Minutes] <Double>  
    [<CommonParameters>]
```

Description

This setting specifies how long a worker process should run idle if no new requests are received and the worker isn't processing any requests. After the idle time-out time passes, the worker process requests to be shut down. A value of 0 disables this time-out. The WSUS Application Pool defaults to 20 minutes which can interfere with WSUS' internal caching, and we recommend changing this setting to 0 (disabling it).

Examples

Example 1: Disable the WSUS Application Pool's idle-timeout setting.

```
Set-WsusIISIdleTimeout -Minutes 0
```

Example 2: Reset the WSUS Application Pool's idle-timeout setting back to its default value.

```
Set-WsusIISIdleTimeout -Minutes 20
```

Get-WsusIISRegularTimeInterval

```
Get-WsusIISRegularTimeInterval  
[<CommonParameters>]
```

Description

The setting specifies the amount of time before the application pool recycles, with a value of 0 disabling the setting. The default value is 1740 minutes (29 hours).

Examples

Example 1: Get information about the WSUS Application Pool's regular time interval setting.

```
Get-WsusIISRegularTimeInterval
```

Set-WsusIISRegularTimeInterval

```
Set-WsusIISRegularTimeInterval  
[-Minutes] <Double>  
[<CommonParameters>]
```

Description

The setting specifies the amount of time before the application pool recycles, with a value of 0 disabling the setting. The WSUS Application Pool defaults to 1740 minutes (29 hours) which can interfere with WSUS' internal caching, and we recommend changing this setting to 0 (disabling it).

Examples

Example 1: Disable the WSUS Application Pool's regular time interval setting.

```
Set-WsusIISRegularTimeInterval -Minutes 0
```

Example 2: Reset the WSUS Application Pool's regular time interval setting back to its default value.

```
Set-WsusIISRegularTimeInterval -Minutes 1740
```

Get-WsusIISPingEnabled

```
Get-WsusIISPingEnabled  
[<CommonParameters>]
```

Description

The setting specifies whether the worker processes serving the WSUS Application Pool are pinged periodically to ensure they're responsive, which is part of a process called health monitoring. The default value is true.

Examples

Example 1: Get information about the WSUS Application Pool's ping enabled setting.

```
Get-WsusIISPingEnabled
```

Set-WsusIISPingEnabled

```
Set-WsusIISPingEnabled  
[-Enabled] <Boolean>  
[<CommonParameters>]
```

Description

The setting specifies whether the worker processes serving the WSUS Application Pool are pinged periodically to ensure they're responsive, which is part of a process called health monitoring. The WSUS Application Pool defaults to true which can interfere with WSUS' internal caching, and we recommend changing this setting to false. This will prevent IIS from recycling the pool if it gets too busy and doesn't respond to the ping.

Examples

Example 1: Disable the WSUS Application Pool's ping enabled setting.

```
Set-WsusIISPingEnabled -Enabled $false
```

Example 2: Reset the WSUS Application Pool's regular time interval setting back to its default value.

```
Set-WsusIISPingEnabled -Enabled $true
```

New-GraphAPICertificate

```
New-GraphAPICertificate  
  [[-FileName] <String>]  
  [[-OutputPath] <String>]  
  [-SkipCopyToWAMFolder]  
  [[-NotAfter] <DateTime>]  
  [-WhatIf]  
  [<CommonParameters>]
```

Description

Generates a new .cer/.pfx file combination that can be used for Graph authentication and saves the (encrypted) .pfx file password to WAM's program data folder.

The new .cer/.pfx file will be exported to the Desktop (or to the OutputPath specified) and the .pfx file will be copied to WAM's program data folder so it can be used for Graph authentication (unless the SkipCopyToWAMFolder switch is passed).

If the -SkipCopyToWAMFolder switch is passed you will need to manually copy the new .pfx file to WAM's program data folder (%ProgramData%\AJ Tek\WAM) and ensure the copied file is named Graph_Certificate.pfx.

Examples

*Example 1: Generates a new .cer/.pfx file combination with the name "WSUS Automated Maintenance" for Graph authentication and saves it to the Desktop folder, **overwriting** any previously saved .cer/.pfx file with the same name and copying the new .pfx file to WAM's program data folder.*

```
New-GraphAPICertificate
```

*Example 2: Generates a new .cer/.pfx file combination with the name "WAM_Graph_Auth" for Graph authentication and saves it to the C:\ drive, **overwriting** any previously saved .cer/.pfx file with the same name and copying the new .pfx file to WAM's program data folder. The certificate/key will expire on January 1st, 2033.*

```
New-GraphAPICertificate -FileName "WAM_Graph_Auth" -OutputPath "C:\\" -  
NotAfter "January 1, 2033"
```