Technical white paper

Deploying Windows Updates using WSUS and MBSA

Windows-based HP Thin Clients

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Overview

This white paper describes the requirements and strategy recommended by HP for using Windows Server Update Services (WSUS) and Microsoft Baseline Security Analyzer (MBSA) to deploy Windows updates to HP thin clients that are based on Windows Embedded Standard 7 or Windows 10 IoT Enterprise.

Note
Windows Embedded Standard 7 includes Windows Embedded Standard 7E and Windows Embedded Standard 7P.

Deployment of Windows updates to thin clients is a challenge because of the volume of updates, the limited storage available on thin clients, and the fact that many updates are not certified for embedded operating systems (which can cause device reliability concerns). For these reasons, HP thin clients have the Windows Update service disabled by default.

Requirements for applying Windows security patches

HP supports periodically applying Windows updates to HP thin clients under the following conditions:

- You must configure the thin client's operating system exactly as described in Windows Server Update Services.
- Each thin client must have at least 2 GB of free space in flash memory after the updates are applied.
- If a thin client's operating system is Windows 10 IoT Enterprise, its total flash memory capacity must be at least 32 GB. If additional flash memory must be added to the thin client to meet the requirement, you must purchase it.

  Note
  HP does not cover warranty issues for third-party parts.

- For Windows Embedded Standard 7, File-Based Write Filter (FBWF) must be used because of limitations in the behavior of Enhanced Write Filter (EWF) regarding the protection of individual directories on a given volume, For Windows 10 IoT Enterprise, Unified Write Filter (UWF) must be used. Usage of EWF and UWF must follow these guidelines:
  – The write filter must be enabled during end-user (non- administrator) operation and should be disabled only temporarily by an administrator needing to make changes to the system. The write filter should be re-enabled as soon as the changes are completed.
  – Never enable the Windows Page File feature unless the system is configured with a flash drive that has an endurance sufficient for the high volume of writes this feature produces.

Additional precautions

HP recommends taking the following additional precautions when deploying updates to HP thin clients:

- Download the latest operating system (OS) image for your thin clients from HP. Updated images released by HP contain software updates, including cumulative Critical and Important updates. If you use the latest image available, you do not need to install as many updates through WSUS. In addition, updates integrated into the image are more streamlined and generally take up less space than if the updates were deployed cumulatively through WSUS.
- Deploy updates in stages. Due to the disk size limitation, you should deploy only a few updates at a time, based on update size. For example, when connecting a thin client to WSUS for the first time, there might be 50, 100, or more updates available, depending on the creation date of the image and the life cycle of the Windows product. Deploying updates in groups of 10 or less is recommended.
- Concentrate on updates marked **Critical** and **Important** first. These updates are the most necessary for security and stability. Updates in other categories might not be necessary, depending on your usage scenario.

Windows Server Update Services

Windows Server Update Services (WSUS) allows you to manage the deployment of Windows updates to HP thin clients. Because of the stateless nature of thin clients, you must make some configurations to integrate them into a WSUS-managed environment.

Enabling WSUS for Windows 10 IoT Enterprise

Note
WSUS version 4.0 or later is required for Windows 10 IoT Enterprise support.

Preparing the thin client

1. Log on to the thin client as Administrator.
2. Select **Start** > **All Apps** > **Windows System**.
3. Right-click **Command Prompt** and select **Run as administrator**.
4. Disable the UWF and restart the system by entering the following commands:
   ```
   uwfmgr filter disable
   shutdown -r -t 0
   ```
5. After the system restarts, log on as Administrator.
6. Select **Start** > **All Apps** > **Windows System**.
7. Right-click **Command Prompt** and select **Run as administrator**.
8. In Command Prompt, set the Windows Update service to automatically start by entering the following command:
   ```
   sc config wuauserv start= auto
   ```
9. Execute the command to open the Local Group Policy Editor: `gpedit.msc`.
10. In the left pane of the Local Group Policy Editor, expand **Computer Configuration** > **Policies** > **Administrative Templates** > **Windows Components**, and then select **Windows Update**.
11. In the right pane, double-click **Specify intranet Microsoft update service location**.
12. Select **Enabled** to enable the policy.
13. Under **Options**, specify the local WSUS server in the **Set the intranet update service for detecting updates** box.
14. Specify the local statistics server in the **Set the intranet statistics server** box.

    Note
    You can specify the same server using the format `http://<server name>:<port>` for both options. For example, enter `http://myserver:8530` in both boxes (where *myserver* is the name of the WSUS server and *8530* is the default WSUS port for HTTP traffic). Make sure that the server name is resolvable by DNS.

15. Close the **Local Group Policy Editor**.
16. Enable updates for all Microsoft products by doing the following:
    A. Select **Start** > **Settings** > **Update & security**.
    B. Select **Advanced options**.
    C. Select the **Give me updates for other Microsoft products when I update Windows** option.
    D. Close the Settings window.
17. Register the thin client with the WSUS server by entering the following commands:
    ```
    wuauclt /detectnow
    wuauclt /reportnow
    ```

    Note
    This can take several minutes.

18. Enable the UWF and start the system by entering the following commands:
    ```
    uwfmgr filter enable
    shutdown -r -t 0
    ```

Applying updates through the servicing mode

1. Log on to the thin client as Administrator.
2. Select **Start** > **All Apps** > **Windows System**.
3. Right-click **Command Prompt** and select **Run as administrator**.
4. Enter the following commands:
   ```
   uwfmgr.exe servicing enable
   shutdown -r -t 0
   ```

After you restart the thin client, it automatically logs on to the servicing account and servicing starts. After servicing starts, no user interaction is required. The system might restart, if it is required by the Windows updates that are being installed. If a restart is required, the system re-enters servicing mode after the restart and continues until all updates have been installed. During servicing, the UwfServicingScr.scr screensaver is displayed on the device.

If the Windows updates cannot be installed or return an error, servicing is disabled, the system restarts with UWF re-enabled, and all file and registry exclusions are restored to their original state.

Creating a servicing task

Updates can be configured as an automated and scheduled task within your environment via the following procedure:

1. Log on to the thin client as Administrator.
2. Select **Start** > **All Apps** > **Windows System**.
3. Right-click **Command Prompt** and select **Run as administrator**.
4. Disable the UWF and reboot the system by entering the following commands:
   ```
   uwfmgr filter disable
   shutdown -r -t 0
   ```
5. After the system restarts, log on as Administrator.
6. Select **Start** > **All Apps** > **Windows Administrative Tools** > **Task Scheduler**.
7. In Task Scheduler, select **Action** > **Create Task**.
8. Under the **General** tab of the Create Task dialog box, do the following:
   A. Enter a name for the task, such as `Windows Servicing`.
   B. Enter a description of the task.
   C. Select **Change User or Group**, select the **UWF-Servicing** account, and then select **OK**.
   D. Select **Run whether user is logged on or not**.
   E. Select **Run with highest privileges**.
9. Under the **Triggers** tab, specify the time and interval to use for Windows Servicing.
10. Under the **Actions** tab, add a new action to enable servicing as follows:
    A. Select **New**.
    B. Make sure that **Start a program** is selected as the action.
    C. Enter the following command in the **Program/script** box:
    ```
    uwfmgr.exe
    ```
    D. Enter the following argument in the **Add arguments (optional)** box:
    ```
    servicing enable
    ```
    E. Select **OK**.
11. Under the **Actions** tab, add a new action to restart the thin client:
    A. Select **New**.
    B. Make sure that **Start a program** is selected as the **Action**.
    C. Enter the following command in the **Program/script** box:
    ```
    shutdown.exe
    ```
    D. Enter the following argument in the **Add arguments (optional)** box:
    ```
    -r -t 0
    ```
    E. Select **OK**.
12. In the Create Task dialog box, select **OK**.
13. When prompted, provide the Administrator account credentials.

14. Enable UWF and restart the system by entering the following commands:

    ```
    uwfmgr filter enable
    shutdown -r -t 0
    ```

Enabling WSUS for Windows Embedded Standard 7

To enable automatic updates through WSUS on an HP thin client running Windows Embedded Standard 7, use the following procedure.

Note
Due to the limitations in the behavior of the EWF related to the protection of individual directories on a given volume, these instructions assume that the FBWF is in use.

Preparing the thin client

1. Log on to the thin client as Administrator.
2. Select **Start** > **All Programs** > **Accessories**.
3. Right-click **Command Prompt** and select **Run as administrator**.
4. Disable the FBWF and restart the system by entering the following commands:

    ```
    fbwfmgr /disable
    shutdown -r -t 0
    ```

5. After the system restarts, log on as Administrator.
6. Select **Start** > **All Programs** > **Accessories**.
7. Right-click **Command Prompt** and select **Run as administrator**.
8. In Command Prompt, create a directory to store WSUS update packages to be installed; for example:

    ```
    md C:\WSUS
    ```

9. Configure the security permissions on this directory so that only administrators can access the files in this directory.

    Note
    HP recommends that you set administrator access to **Allow for Full Control** for the unprotected directory and files in this directory, and that you set all user (non-administrator) access to **Deny for Full Control** for the same directory and files.

10. Enable FBWF for the next system restart by entering the following command:

    ```
    fbwfmgr /enable
    ```

11. Add the update directory to the FBWF exclusion list; for example:

    ```
    fbwfmgr /addexclusion C: \WSUS
    ```

12. Download the **Windows Update Servicing with Write Filter (WUS-WF) Solution** from Microsoft at http://go.microsoft.com/fwlink/?LinkId=195328.

    Note
    For more information about how the solution files control the servicing flow for Windows Update, go to https://msdn.microsoft.com/en-us/library/ff850921.aspx.

13. Extract the contents of **WUS-WF.zip** to the exclusion directory created in step 8 (C:\WSUS).

    There are now three files within this directory:

    - WUS-WF.vbs
    - WindowsUpdateWithWriteFilter-Scheduled.xml
    - WindowsUpdateWithWriteFilter-Startup.xml

14. Make sure that the built-in Administrator account is enabled and has a password set. You can do this by entering the following command:

    ```
    net user administrator /active: yes
    ```

    – or –

    Configure the scripts to use a different user in the Administrators group, as follows:

    A. Look for the string `<UserId>Administrator</UserId>` in WindowsUpdateWithWriteFilter-Startup.xml and WindowsUpdateWithWriteFilter-Scheduled.xml.

B. Replace this string in each file with the following, where *Name* is the name of any other user in the Administrators group:

```
<UserId>Name</UserId>
```

Scheduling updates in Task Scheduler

Next, two tasks must be added to Task Scheduler. These tasks are defined in WindowsUpdateWithWriteFilter-Startup.xml and WindowsUpdateWithWriteFilter-Scheduled.xml.

WindowsUpdateWithWriteFilter-Scheduled.xml

This task checks for available Windows updates at a scheduled time. The schedule can be changed to suit your environment. This task can run while any user is logged on to the system and runs even if no one is logged on to the system. If updates are found, the write filter is disabled and the system is restarted.

To add the WindowsUpdateWithWriteFilter-Scheduled task to Task Scheduler:

1. Select **Start** > **All Programs** > **Accessories** > **System Tools** > **Task Scheduler**.
2. In Task Scheduler, select **Action** > **Import Tasks**.
3. Navigate to the unprotected directory (C:\WSUS), select the **WindowsUpdateWithWriteFilter-Startup.xml** file, and then select **Open**.
4. In the Create Task dialog box, select the **Actions** tab.
5. Select the **Start a program** action from the list, and then select **Edit**.
6. Change the working directory to the unprotected directory that you created previously (C:\WSUS).

   Note
   Do not change the other settings.

7. Select **OK**.
8. Select the **Triggers** tab, if you want to change the scheduled time for this task.

   Note:
   By default, the task is scheduled to run at 3:00 AM daily.

   To change the scheduled time:

   A. Select the **Daily** trigger, and then select **Edit**.

   B. Select the new scheduled time, and then select **OK**.

9. In the Create Task dialog box, select **OK**.
10. When prompted, provide the Administrator account credentials.

WindowsUpdateWithWriteFilter-Startup.xml

This task applies the available updates if updates are found by the WindowsUpdateWithWriteFilter-Scheduled task. This task runs at startup. The updates are searched for and applied only if the WindowsUpdateWithWriteFilter-Scheduled task finds pending updates. This task can run while any user is logged on to the system, and runs even if no one is logged on to the system.

If updates are found, the updates applied by WindowsUpdateWithWriteFilter-Startup become persistent, because the write filter was disabled by the WindowsUpdateWithWriteFilter-Scheduled task. After the updates are applied, the write filter is enabled and the system is restarted.

Note
If the updates have license terms associated with them, the license terms are automatically accepted; however, they are saved for later review in a folder named SavedEULAs in the unprotected directory.

Any logs or errors from this process are written to a log file that is named UpdateLog.log in the unprotected directory.

To add the WindowsUpdateWithWriteFilter-Startup task to Task Scheduler:

1. Select **Start** > **All Programs** > **Accessories** > **System Tools** > **Task Scheduler**.
2. In Task Scheduler, select **Action** > **Import Task**.
3. Navigate to the unprotected directory (C:\WSUS), select the **WindowsUpdateWithWriteFilter-Startup.xml** file, and then select **Open**.
4. In the Create Task dialog box, select the **Actions** tab.
5. Select the **Start a program** action from the list, and then select **Edit**.

6. Change the working directory to the unprotected directory that you created earlier (C:\WSUS).

   Note
   Do not change the other settings.

7. Select **OK**.

   Note
   Do not change the trigger settings.

8. In the Create Task dialog box, select **OK**.
9. If prompted, provide the Administrator account credentials.

Disabling Windows Update

When you are using the WUS-WF solution for updates (instead of using the Windows Update program), you must configure Windows Update to never search for updates as follows:

1. Select **Start** > **All Programs** > **Windows Update**.
2. Select **Change settings**.
3. From the **Important updates** list, select **Never check for updates (Not Recommended)**, and then select **OK**.

Re-enabling the write filter

If you did not re-enable the write filter earlier, you must re-enable the write filter and restart the system for your changes to take effect.

1. In a command prompt, enter the following command:
   ```
   fbwfmgr /enable
   ```
2. Restart the system by entering the following command:
   ```
   shutdown -r -t 0
   ```

Microsoft Baseline Security Analyzer

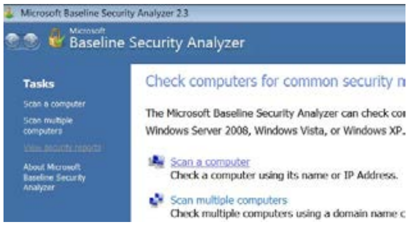
Preparing the thin client

Important
You must disable the write filter for your changes to take effect. Re-enable the write filter after completing the procedure.

1. Log on to the thin client as Administrator.
2. Set the thin client RAM drive size to up to 512 MB as follows:
   A. Select **Start** > **Control Panel** > **HP RAMDisk Manager**.
   B. In HP RAMDisk Manager, drag the slider to **512 MB**, and then select **OK**.
3. Enable Windows Update as follows:
   A. Run `services.msc`.
   B. In the Services window, double-click **Windows Update**.
   C. In the Windows Update Properties dialog box, select **Manual** for the startup type, and then select **OK**.
4. If a thin client's OS is Windows Embedded Standard 7, verify that KB3102810 has been installed as follows:
   A. Select **Start** > **Control Panel** > **Programs and Features**.
   B. On the left side of the window, select **View installed updates**.
   C. If KB3102810 is not installed, download it from https://support.microsoft.com/en-us/kb/3102810 and install it.
5. Go to https://www.microsoft.com/en-us/download/details.aspx?id=7558, and then download, install, and run MBSA version 2.3 or later on the thin client.

Applying Windows updates

1. In MBSA, select **Scan a computer**.



Microsoft Baseline Security Analyzer 2.3
Microsoft
Baseline Security Analyzer
Tasks
Scan a computer
Scan multiple computers
View security reports
About Microsoft Baseline Security Analyzer

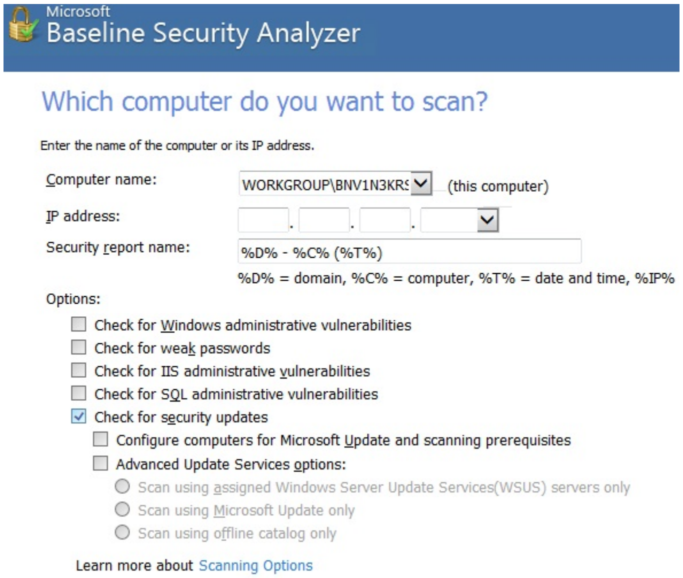
Check computers for common security n

The Microsoft Baseline Security Analyzer can check co
Windows Server 2008, Windows Vista, or Windows XP.

Scan a computer
Check a computer using its name or IP Address.

Scan multiple computers
Check multiple computers using a domain name c

2. Select the **Check for security updates** option, and then start the scan.



Which computer do you want to scan?

Enter the name of the computer or its IP address.

Computer name: WORKGROUP\BNV1N3KRS (this computer)

IP address: . . .

Security report name: %D% - %C% (%T%)

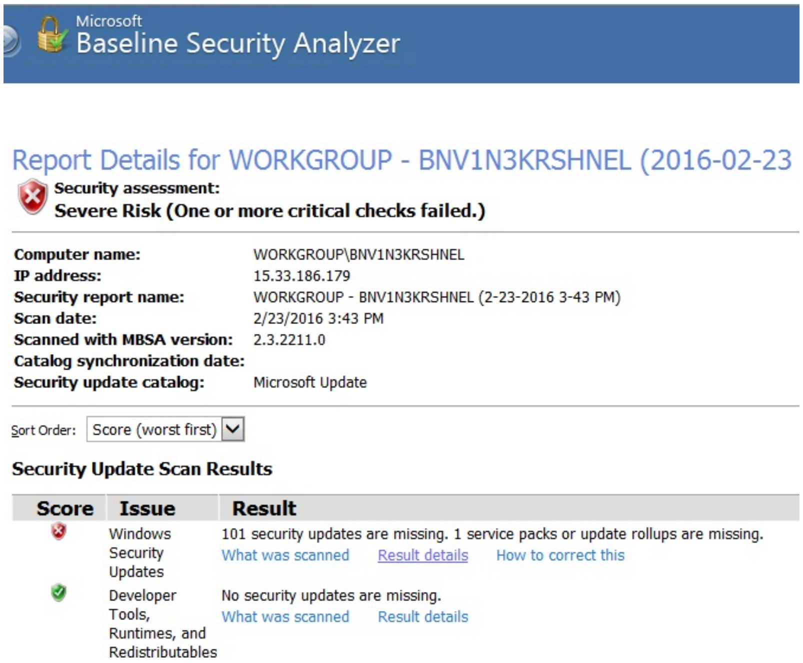
%D% = domain, %C% = computer, %T% = date and time, %IP%

Options:

- ☐ Check for Windows administrative vulnerabilities
- ☐ Check for weak passwords
- ☐ Check for IIS administrative vulnerabilities
- ☐ Check for SQL administrative vulnerabilities
- ☑ Check for security updates
  - ☐ Configure computers for Microsoft Update and scanning prerequisites
  - ☐ Advanced Update Services options:
    - ○ Scan using assigned Windows Server Update Services(WSUS) servers only
    - ○ Scan using Microsoft Update only
    - ○ Scan using offline catalog only

Learn more about Scanning Options

3. After the scan is complete, select **Result details** under the **Windows Security Updates** issue category.



Report Details for WORKGROUP - BNV1N3KRSHNEL (2016-02-23

Security assessment:
Severe Risk (One or more critical checks failed.)

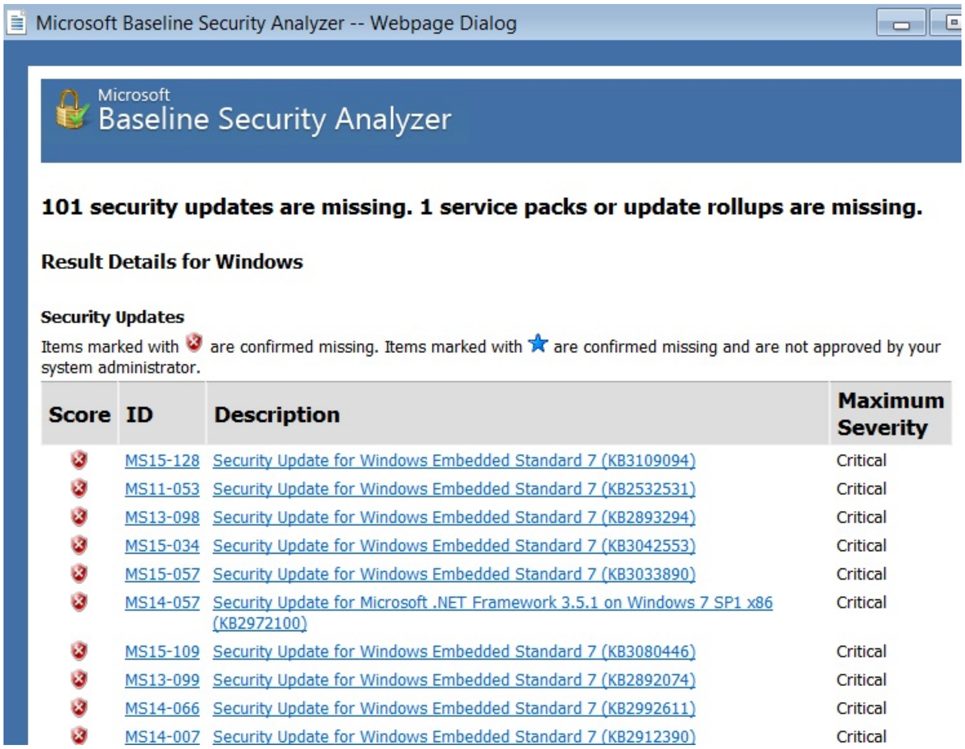
Computer name:	WORKGROUP\BNV1N3KRSHNEL
IP address:	15.33.186.179
Security report name:	WORKGROUP - BNV1N3KRSHNEL (2-23-2016 3-43 PM)
Scan date:	2/23/2016 3:43 PM
Scanned with MBSA version:	2.3.2211.0
Catalog synchronization date:	
Security update catalog:	Microsoft Update

Sort Order: Score (worst first)

Security Update Scan Results

Score	Issue	Result
✗	Windows Security Updates	101 security updates are missing. 1 service packs or update rollups are missing. What was scanned Result details How to correct this
✓	Developer Tools, Runtimes, and Redistributables	No security updates are missing. What was scanned Result details

4. Notice the updates listed as **Critical**.



Microsoft Baseline Security Analyzer -- Webpage Dialog

Microsoft
Baseline Security Analyzer

101 security updates are missing. 1 service packs or update rollups are missing.

Result Details for Windows

Security Updates

Items marked with ✖ are confirmed missing. Items marked with ★ are confirmed missing and are not approved by your system administrator.

Score	ID	Description	Maximum Severity
✖	MS15-128	Security Update for Windows Embedded Standard 7 (KB3109094)	Critical
✖	MS11-053	Security Update for Windows Embedded Standard 7 (KB2532531)	Critical
✖	MS13-098	Security Update for Windows Embedded Standard 7 (KB2893294)	Critical
✖	MS15-034	Security Update for Windows Embedded Standard 7 (KB3042553)	Critical
✖	MS15-057	Security Update for Windows Embedded Standard 7 (KB3033890)	Critical
✖	MS14-057	Security Update for Microsoft .NET Framework 3.5.1 on Windows 7 SP1 x86 (KB2972100)	Critical
✖	MS15-109	Security Update for Windows Embedded Standard 7 (KB3080446)	Critical
✖	MS13-099	Security Update for Windows Embedded Standard 7 (KB2892074)	Critical
✖	MS14-066	Security Update for Windows Embedded Standard 7 (KB2992611)	Critical
✖	MS14-007	Security Update for Windows Embedded Standard 7 (KB2912390)	Critical

5. Verify that there is enough flash memory on the thin client by determining the total size of all critical updates.
6. Download all critical updates to a USB flash drive or network drive.
7. Access these updates from the thin client and follow the instructions to install them.
8. Repeat steps 3 through 7, but for the **Developer Tools, Runtimes, and Redistributables** issue category.
9. If the thin client OS is Windows Embedded Standard 7, verify that KB2852386 has been installed as follows:
   A. Select **Start** > **Control Panel** > **Programs and Features**.
   B. On the left side of the window, select **View installed updates**.
   C. If KB2852386 is not installed, download it from https://support.microsoft.com/en-us/kb/2852386 and install it.
   D. Run `cleanmgr.exe`.
   E. In the Disk Cleanup window, select **OK**, and then select **Windows Update Cleanup** to free disk space.

   Note
   For more information, go to https://blogs.technet.microsoft.com/askpfeplat/2013/10/08/breaking-news-reduce-the-size-of-the-winsxs-directory-and-free-up-disk-space-with-a-new-update-for-windows-7-sp1-clients/ and see the “How to Automate Windows Update Cleanup” section.

10. Disable the Windows Update service as follows:
    A. Run `services.msc`.
    B. In the Services window, double-click **Windows Update**.
    C. In the Windows Update Properties dialog box, select **Disabled** for the startup type, and then select **OK**.

Note
To apply the same updates across multiple thin clients, use HP ThinUpdate to copy the image to a USB flash drive and reimage the thin clients using that image.

For more information

For information about how to deploy and configure a WSUS server within your environment, go to https://technet.microsoft.com/en-us/library/hh852340(v=ws.11).aspx.

For information about UWF servicing mode, including how to add third-party updates into your servicing process, go to https://msdn.microsoft.com/en-us/library/jj962927(v=winembedded.81).aspx.

For information about Windows Update Servicing on Windows Embedded Standard 7, including how to add third-party updates into your servicing process, go to https://msdn.microsoft.com/en-us/library/ff850921.aspx.

For more information about HP thin clients, go to the following websites:

- **HP thin client software and operating system website**: http://www.hp.com/go/thinclient
- **HP support website**: http://www.hp.com/support (search for the thin client model to find the support page for that particular model

Sign up for updates
hp.com/go/getupdated

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