How to detect, enable and disable SMBv1, SMBv2 and SMBv3 in Windows

Applies to: Windows Server 2022, Windows 10, Windows 8.1, Windows 8, Windows Server 2019, Windows Server 2016, Windows Server 2012 R2, Windows Server 2012

https://docs.microsoft.com/en-us/windows-server/storage/file-server/troubleshoot/detect-enable-and-disable-smbv1-v2-v3

This article describes how to enable and disable Server Message Block (SMB) version 1 (SMBv1), SMB version 2 (SMBv2), and SMB version 3 (SMBv3) on the SMB client and server components.

While disabling or removing SMBv1 might cause some compatibility issues with old computers or software, SMBv1 has significant security vulnerabilities and we strongly encourage you not to use it.

Disabling SMBv2 or SMBv3 for troubleshooting

We recommend keeping SMBv2 and SMBv3 enabled, but you might find it useful to disable one temporarily for troubleshooting. For more information, see How to detect status, enable, and disable SMB protocols on the SMB Server.

In Windows 10, Windows 8.1, and Windows 8, Windows Server 2019, Windows Server 2016, Windows Server 2012 R2, and Windows Server 2012, disabling SMBv3 deactivates the following functionality:

- Transparent Failover - clients reconnect without interruption to cluster nodes during maintenance or failover
- Scale Out - concurrent access to shared data on all file cluster nodes
- Multichannel - aggregation of network bandwidth and fault tolerance if multiple paths are available between client and server
- SMB Direct - adds RDMA networking support for high performance, with low latency and low CPU use
- Encryption - Provides end-to-end encryption and protects from eavesdropping on untrustworthy networks
- Directory Leasing - Improves application response times in branch offices through caching
- Performance Optimizations - optimizations for small random read/write I/O

In Windows 7 and Windows Server 2008 R2, disabling SMBv2 deactivates the following functionality:

- Request compounding - allows for sending multiple SMBv2 requests as a single network request
- Larger reads and writes - better use of faster networks
- Caching of folder and file properties - clients keep local copies of folders and files
- Durable handles - allow for connection to transparently reconnect to the server if there's a temporary disconnection
- Improved message signing - HMAC SHA-256 replaces MD5 as hashing algorithm
- Improved scalability for file sharing - number of users, shares, and open files per server greatly increased
- Support for symbolic links
- Client oplock leasing model - limits the data transferred between the client and server, improving performance on high-latency networks and increasing SMB server scalability
- Large MTU support - for full use of 10 Gigabit Ethernet (GbE)
- Improved energy efficiency - clients that have open files to a server can sleep

The SMBv2 protocol was introduced in Windows Vista and Windows Server 2008, while the SMBv3 protocol was introduced in Windows 8 and Windows Server 2012. For more information about SMBv2 and SMBv3 capabilities, see the following articles:

How to remove SMBv1

Here's how to remove SMBv1 in Windows 10, Windows 8.1, Windows Server 2019, Windows Server 2016, and Windows 2012 R2.

PowerShell methods

SMBv1 (client and server)

- Detect:

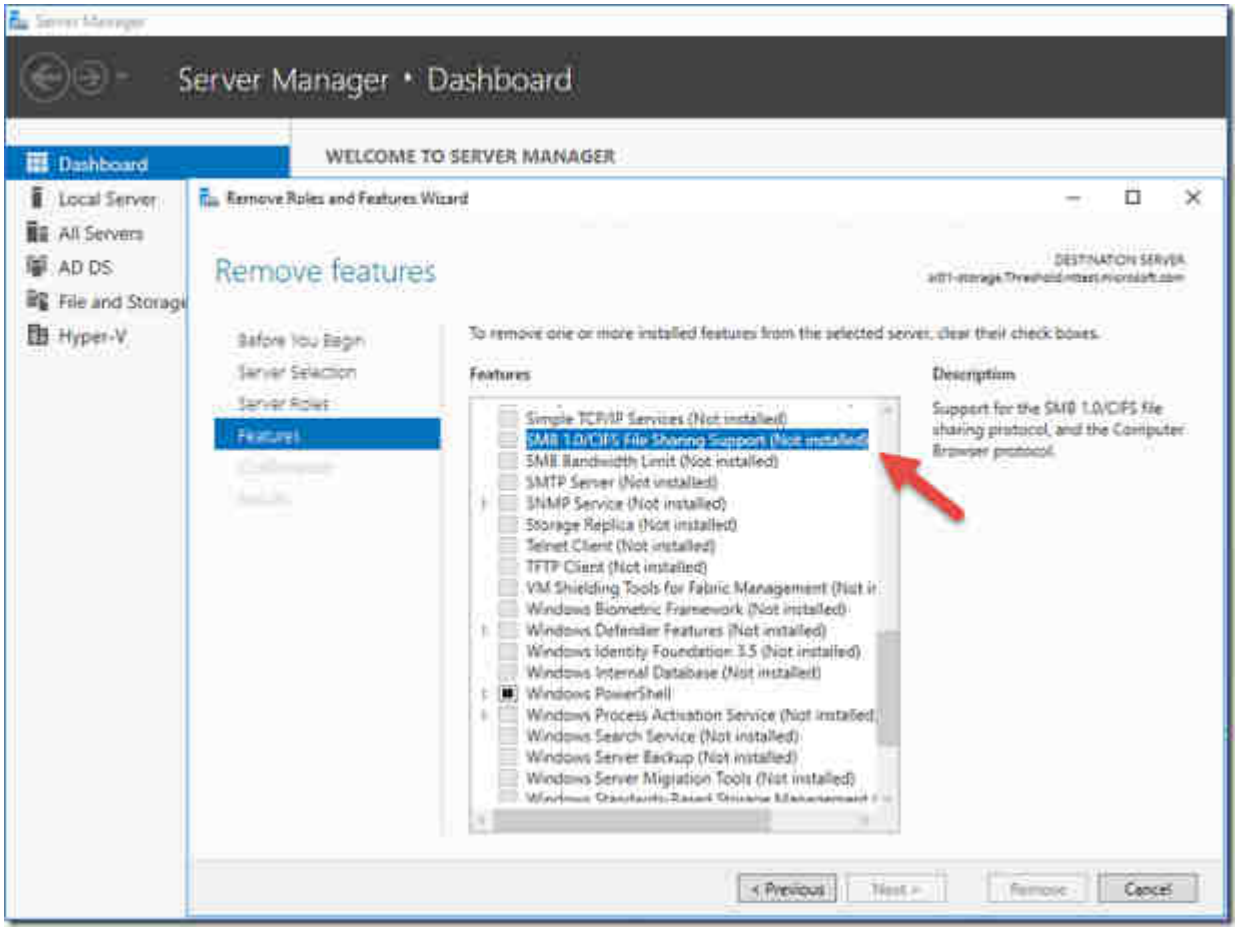
  PowerShell
  ```
  Get-WindowsOptionalFeature -Online -FeatureName smb1protocol
  ```
- Disable:

  PowerShell
  ```
  Disable-WindowsOptionalFeature -Online -FeatureName smb1protocol
  ```
- Enable:

  PowerShell
  ```
  Enable-WindowsOptionalFeature -Online -FeatureName smb1protocol
  ```

Windows Server 2012 R2, Windows Server 2016, Windows Server 2019: Server Manager method for disabling SMB

SMBv1



To remove SMBv1 from Windows Server:

1. On the Server Manager Dashboard of the server where you want to remove SMBv1, under **Configure this local server**, select **Add roles and features**.
2. On the **Before you begin** page, select **Start the Remove Roles and Features Wizard**, and then on the following page, select **Next**.

3. On the **Select destination server** page under **Server Pool**, ensure that the server you want to remove the feature from is selected, and then select **Next**.
4. On the **Remove server roles** page, select **Next**.
5. On the **Remove features** page, clear the check box for **SMB 1.0/CIFS File Sharing Support** and select **Next**.
6. On the **Confirm removal selections** page, confirm that the feature is listed, and then select **Remove**.

Windows 8.1 and Windows 10: PowerShell method

SMBv1 Protocol

- Detect:

  PowerShell
  ```
  Get-WindowsOptionalFeature -Online -FeatureName SMB1Protocol
  ```
- Disable:

  PowerShell
  ```
  Disable-WindowsOptionalFeature -Online -FeatureName SMB1Protocol
  ```
- Enable:

  PowerShell
  ```
  Enable-WindowsOptionalFeature -Online -FeatureName SMB1Protocol
  ```

SMBv2/v3 Protocol (only disables SMBv2/v3 Server)

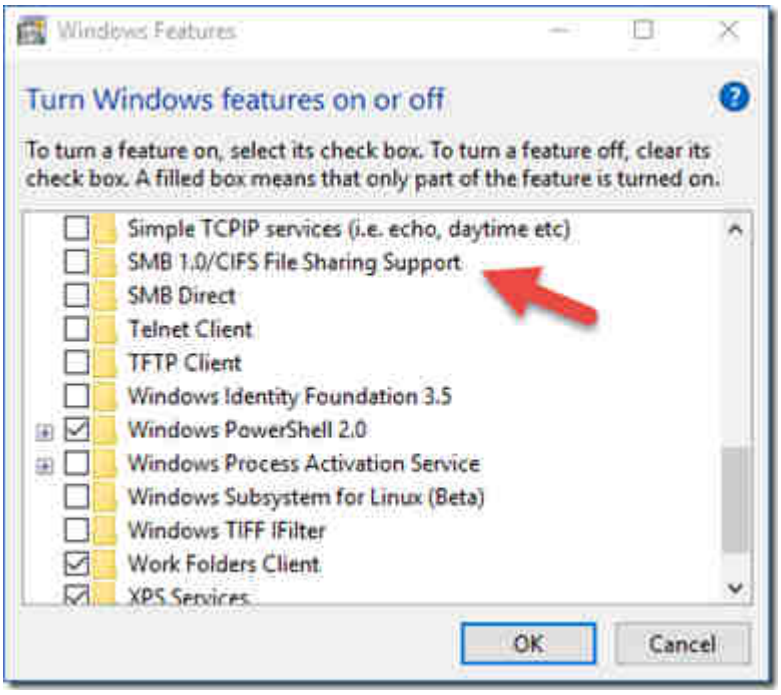
- Detect:

  PowerShell
  ```
  Get-SmbServerConfiguration | Select EnableSMB2Protocol
  ```
- Disable:

  PowerShell
  ```
  Set-SmbServerConfiguration -EnableSMB2Protocol $false
  ```
- Enable:

  PowerShell
  ```
  Set-SmbServerConfiguration -EnableSMB2Protocol $true
  ```

Windows 8.1 and Windows 10: Add or Remove Programs method



To disable SMBv1 on Windows 8.1 and Windows 10:

1. In **Control Panel**, select **Programs and Features**.
2. Under **Control Panel Home**, select **Turn Windows features on or off** to open the **Windows Features** box.
3. In the **Windows Features** box, scroll down the list, clear the check box for **SMB 1.0/CIFS File Sharing Support** and select **OK**.
4. After Windows applies the change, on the confirmation page, select **Restart now**.

How to detect status, enable, and disable SMB protocols on the SMB Server

For Windows 8 and Windows Server 2012

Windows 8 and Windows Server 2012 introduced the new **Set-SMBServerConfiguration** Windows PowerShell cmdlet. The cmdlet enables you to enable or disable the SMBv1, SMBv2, and SMBv3 protocols on the server component.

Note

When you enable or disable SMBv2 in Windows 8 or Windows Server 2012, SMBv3 is also enabled or disabled. This behavior occurs because these protocols share the same stack.

You don't have to restart the computer after you run the **Set-SMBServerConfiguration** cmdlet.

SMBv1 on SMB Server

- Detect:
  PowerShell
  ```
  Get-SmbServerConfiguration | Select EnableSMB1Protocol
  ```
- Disable:
  PowerShell
  ```
  Set-SmbServerConfiguration -EnableSMB1Protocol $false
  ```
- Enable:
  PowerShell
  ```
  Set-SmbServerConfiguration -EnableSMB1Protocol $true
  ```

For more information, see Server storage at Microsoft.

SMB v2/v3 on SMB Server

- Detect:
  PowerShell
  ```
  Get-SmbServerConfiguration | Select EnableSMB2Protocol
  ```
- Disable:
  PowerShell
  ```
  Set-SmbServerConfiguration -EnableSMB2Protocol $false
  ```
- Enable:
  PowerShell
  ```
  Set-SmbServerConfiguration -EnableSMB2Protocol $true
  ```

For Windows 7, Windows Server 2008 R2, Windows Vista, and Windows Server 2008

To enable or disable SMB protocols on an SMB Server that is running Windows 7, Windows Server 2008 R2, Windows Vista, or Windows Server 2008, use Windows PowerShell or Registry Editor.

PowerShell methods

Note

This method requires PowerShell 2.0 or later version of PowerShell.

SMBv1 on SMB Server

- Detect:

  PowerShell

  ```
  Get-Item HKLM:\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters | ForEach-Object {Get-ItemProperty $_.pspath}
  ```

  Default configuration = Enabled (No registry key is created), so no SMB1 value will be returned

- Disable:

  PowerShell

  ```
  Set-ItemProperty -Path "HKLM:\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters" SMB1 -Type DWORD -Value 0 -Force
  ```

- Enable:

  PowerShell

  ```
  Set-ItemProperty -Path "HKLM:\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters" SMB1 -Type DWORD -Value 1 -Force
  ```

Note You must restart the computer after you make these changes. For more information, see Server storage at Microsoft.

SMBv2/v3 on SMB Server

- Detect:

  PowerShell

  ```
  Get-ItemProperty HKLM:\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters | ForEach-Object {Get-ItemProperty $_.pspath}
  ```

- Disable:

  PowerShell

  ```
  Set-ItemProperty -Path "HKLM:\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters" SMB2 -Type DWORD -Value 0 -Force
  ```

- Enable:

  PowerShell

  ```
  Set-ItemProperty -Path "HKLM:\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters" SMB2 -Type DWORD -Value 1 -Force
  ```

Note

You must restart the computer after you make these changes.

Registry Editor

Important

Follow the steps in this section carefully. Serious problems might occur if you modify the registry incorrectly. Before you modify it, **back up the registry for restoration** in case problems occur.

To enable or disable SMBv1 on the SMB server, configure the following registry key:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters

Registry entry: SMB1

```
REG_DWORD: 0 = Disabled
REG_DWORD: 1 = Enabled
Default: 1 = Enabled (No registry key is created)
```

To enable or disable SMBv2 on the SMB server, configure the following registry key:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters

```
Registry entry: SMB2
REG_DWORD: 0 = Disabled
REG_DWORD: 1 = Enabled
Default: 1 = Enabled (No registry key is created)
```

Note

You must restart the computer after you make these changes.

How to detect status, enable, and disable SMB protocols on the SMB Client

For Windows Vista, Windows Server 2008, Windows 7, Windows Server 2008 R2, Windows 8, and Windows Server 2012

Note

When you enable or disable SMBv2 in Windows 8 or in Windows Server 2012, SMBv3 is also enabled or disabled. This behavior occurs because these protocols share the same stack.

SMBv1 on SMB Client

- Detect

  cmd

  ```
  sc.exe qc lanmanworkstation
  ```
- Disable:

  cmd

  ```
  sc.exe config lanmanworkstation depend= bowser/mrxsmb20/nsi
  sc.exe config mrxsmb10 start= disabled
  ```
- Enable:

  cmd

  ```
  sc.exe config lanmanworkstation depend= bowser/mrxsmb10/mrxsmb20/nsi
  sc.exe config mrxsmb10 start= auto
  ```

For more information, see Server storage at Microsoft

SMBv2/v3 on SMB Client

- Detect:

  cmd

  ```
  sc.exe qc lanmanworkstation
  ```
- Disable:

  cmd

  ```
  sc.exe config lanmanworkstation depend= bowser/mrxsmb10/nsi
  sc.exe config mrxsmb20 start= disabled
  ```
- Enable:

  cmd

  ```
  sc.exe config lanmanworkstation depend= bowser/mrxsmb10/mrxsmb20/nsi
  sc.exe config mrxsmb20 start= auto
  ```

Note

- You must run these commands at an elevated command prompt.
- You must restart the computer after you make these changes.

Disable SMBv1 Server with Group Policy

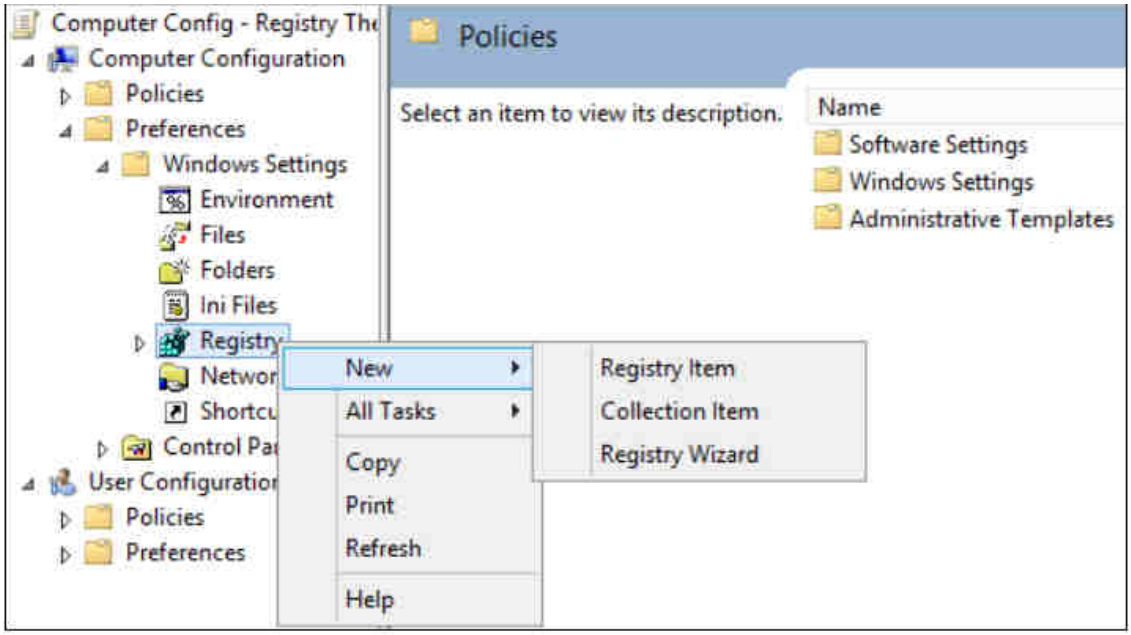
This procedure configures the following new item in the registry:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters

- Registry entry: **SMB1**
- REG_DWORD: **0** = Disabled

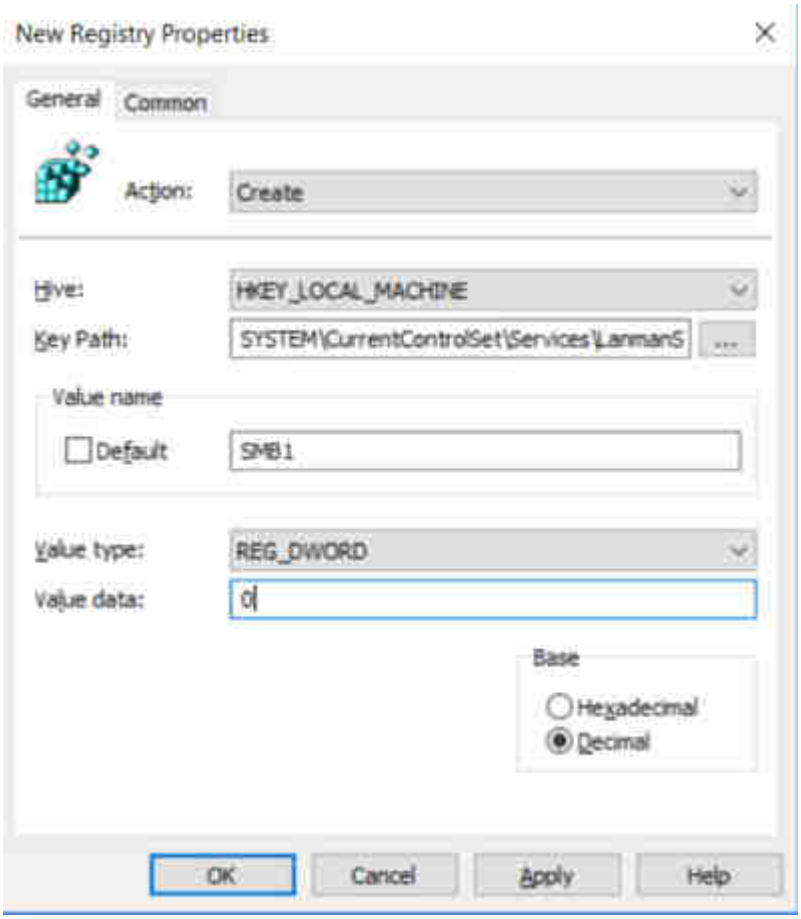
To use Group Policy to configure this, follow these steps:

1. Open the **Group Policy Management Console**. Right-click the Group Policy object (GPO) that should contain the new preference item, and then click **Edit**.
2. In the console tree under **Computer Configuration**, expand the **Preferences** folder, and then expand the **Windows Settings** folder.
3. Right-click the **Registry** node, point to **New**, and select **Registry Item**.



In the **New Registry Properties** dialog box, select the following:

- **Action**: Create
- **Hive**: HKEY_LOCAL_MACHINE
- **Key Path**: SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters
- **Value name**: SMB1
- **Value type**: REG_DWORD
- **Value data**: 0



This procedure disables the SMBv1 Server components. This Group Policy must be applied to all necessary workstations, servers, and domain controllers in the domain.

Note

WMI filters can also be set to exclude unsupported operating systems or selected exclusions, such as Windows XP.

Important

Be careful when you make these changes on domain controllers on which legacy Windows XP or older Linux and third-party systems (that don't support SMBv2 or SMBv3) require access to SYSVOL or other file shares where SMB v1 is being disabled.

Disable SMBv1 Client with Group Policy

To disable the SMBv1 client, the services registry key needs to be updated to disable the start of **MRxSMB10** and then the dependency on **MRxSMB10** needs to be removed from the entry for **LanmanWorkstation** so that it can start normally without requiring **MRxSMB10** to first start.

This guidance updates and replaces the default values in the following two items in the registry:

`HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\mrxsmb10`

Registry entry: **Start** REG_DWORD: **4**= Disabled

`HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\LanmanWorkstation`

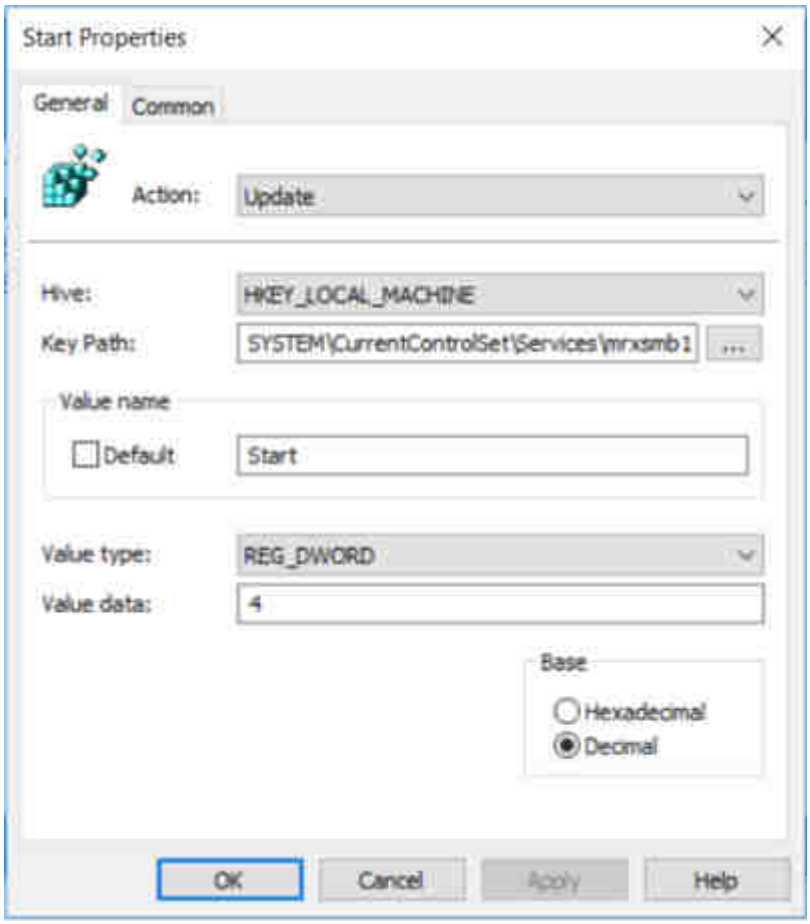
Registry entry: **DependOnService** REG_MULTI_SZ: **"Bowser","MRxSmb20”,"NSI"**

Note

The default included MRxSMB10 which is now removed as dependency.

To configure this by using Group Policy, follow these steps:

1. Open the **Group Policy Management Console**. Right-click the GPO that should contain the new preference item, and then click **Edit**.
2. In the console tree under **Computer Configuration**, expand the **Preferences** folder, and then expand the **Windows Settings** folder.
3. Right-click the **Registry** node, point to **New**, and select **Registry Item**.
4. In the **New Registry Properties** dialog box, select the following:
   - **Action**: Update
   - **Hive**: HKEY_LOCAL_MACHINE
   - **Key Path**: SYSTEM\CurrentControlSet\services\mrxsmb10
   - **Value name**: Start
   - **Value type**: REG_DWORD
   - **Value data**: 4



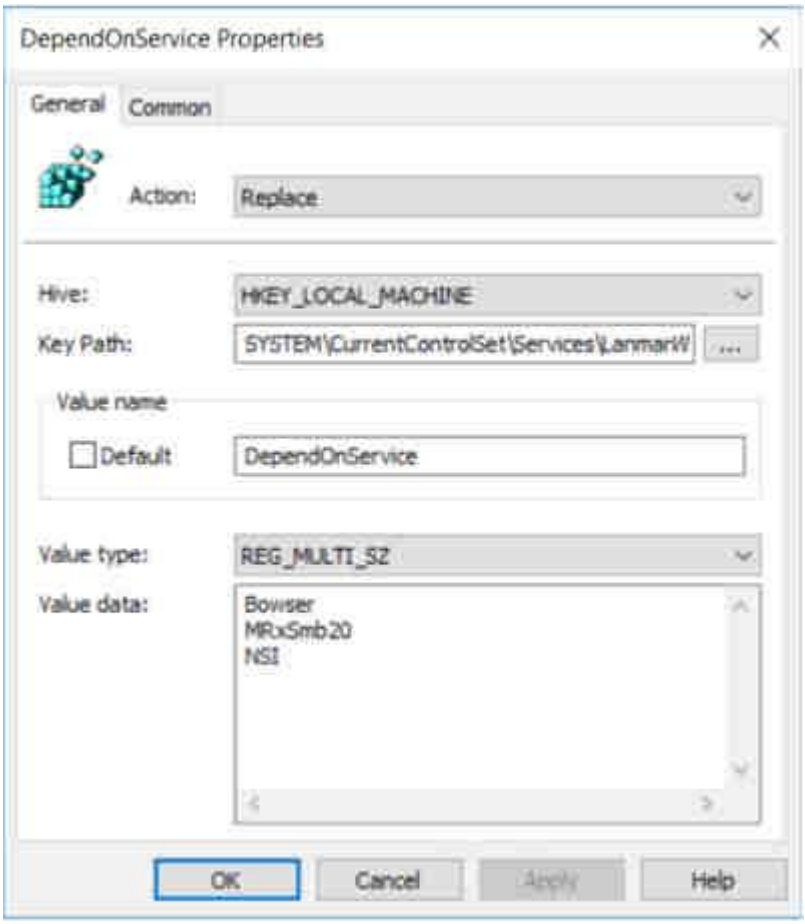
5. Then remove the dependency on the **MRxSMB10** that was disabled.

   In the **New Registry Properties** dialog box, select the following:

   - **Action**: Replace
   - **Hive**: HKEY_LOCAL_MACHINE
   - **Key Path**: SYSTEM\CurrentControlSet\Services\LanmanWorkstation
   - **Value name**: DependOnService
   - **Value type**: REG_MULTI_SZ
   - **Value data**:
     - Bowser
     - MRxSmb20
     - NSI

Note

These three strings will not have bullets (see the following screen shot).



The default value includes **MRxSMB10** in many versions of Windows, so by replacing them with this multi-value string, it is in effect removing **MRxSMB10** as a dependency for **LanmanServer** and going from four default values down to just these three values above.

> **Note**
>
> When you use Group Policy Management Console, you don't have to use quotation marks or commas. Just type each entry on individual lines.

6. Restart the targeted systems to finish disabling SMB v1.

Auditing SMBv1 usage

To determine which clients are attempting to connect to an SMB server with SMBv1, you can enable auditing on Windows Server 2016, Windows 10, and Windows Server 2019. You can also audit on Windows 7 and Windows Server 2008 R2 if the May 2018 monthly update is installed, and on Windows 8.1 and Windows Server 2012 R2 if the July 2017 monthly update is installed.

- Enable:

  PowerShell
  ```
  Set-SmbServerConfiguration -AuditSmb1Access $true
  ```
- Disable:

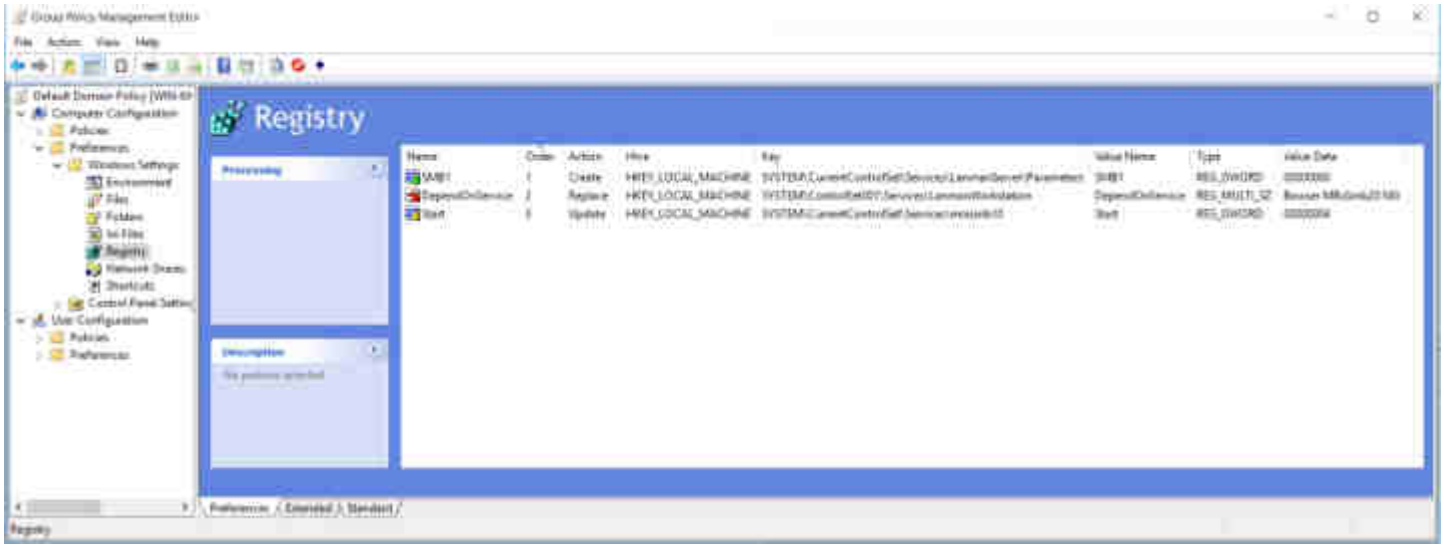
  PowerShell
  ```
  Set-SmbServerConfiguration -AuditSmb1Access $false
  ```
- Detect:

  PowerShell
  ```
  Get-SmbServerConfiguration | Select AuditSmb1Access
  ```

When SMBv1 auditing is enabled, event 3000 appears in the "Microsoft-Windows-SMBServer\Audit" event log, identifying each client that attempts to connect with SMBv1.

Summary

If all the settings are in the same GPO, Group Policy Management displays the following settings.



Testing and validation

After completing the configuration steps in this article, allow the policy to replicate and update. As necessary for testing, run **gpupdate /force** at a command prompt, and then review the target computers to make sure that the registry settings are applied correctly. Make sure SMBv2 and SMBv3 are functioning for all other systems in the environment.

Note

Don't forget to restart the target systems.