

Online Backup Manager v7

Microsoft System State Backup and Restore Guide

8 September 2017

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Revision History

Date	Descriptions	Type of modification
26 July 2016	First Draft	New
3 Feb 2017	Added instructions and screen shots for Encryption key handling in Ch. 5.1	New
5 Apr 2017	Added Encryption Type option in Ch. 5.1 Create a MS Windows System State Backup Set section	New

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Introduction

The MS Windows System State Backup module of OBM provides you with a set of tools to protect your Windows operating system. This leverages Microsoft's native Wbadmin command-line tool (<http://go.microsoft.com/fwlink/?LinkId=140216>), and recovery feature.

The system components included in a system state backup depend on the server roles that are installed (e.g. Active Directory, Internet Information Service ... etc.).

System state data is comprised of the following files:

- ▶ Boot files, including the system files, and all files protected by Windows File Protection (WFP)
- ▶ Active Directory (on a domain controller only)
- ▶ Sysvol (on a domain controller only)
- ▶ Certificate Services (on certification authority only)
- ▶ Cluster database (on a cluster node only)
- ▶ Component Services Class registration database
- ▶ Performance counter configuration information
- ▶ Microsoft Internet Information Services (IIS) meta directory (on a IIS server only)
- ▶ Registry

Overview

This document contains information that are essential for understanding the MS Windows System State backup and recovery process:

1. [Requirement and Limitation](#)
2. [Best Practice and Recommendation](#)
3. [Restore Consideration](#)
4. [Starting OBM](#)
5. [Configuring a MS Windows System State Backup Set](#)
6. [Overview on the Backup Process](#)
7. [Running a Backup](#)
8. [Restore with a MS Windows System State Backup Set](#)

1 Requirement and Limitation

1.1 Hardware Requirement

Refer to the following article for the list of hardware requirements for OBM: [FAQ: Hardware Requirement List \(HRL\) for version 7.3 or above](#)

1.2 Software Requirement

Refer to the following article for the list of compatible Windows operating systems platforms: [FAQ: Software Compatibility List \(SCL\) for version 7.3 or above](#)

1.3 Other Requirement and Limitation

Ensure that the following requirements are met:

OBM Installation

Make sure that OBM is installed on the server to be backed up.

Backup Quota Requirement

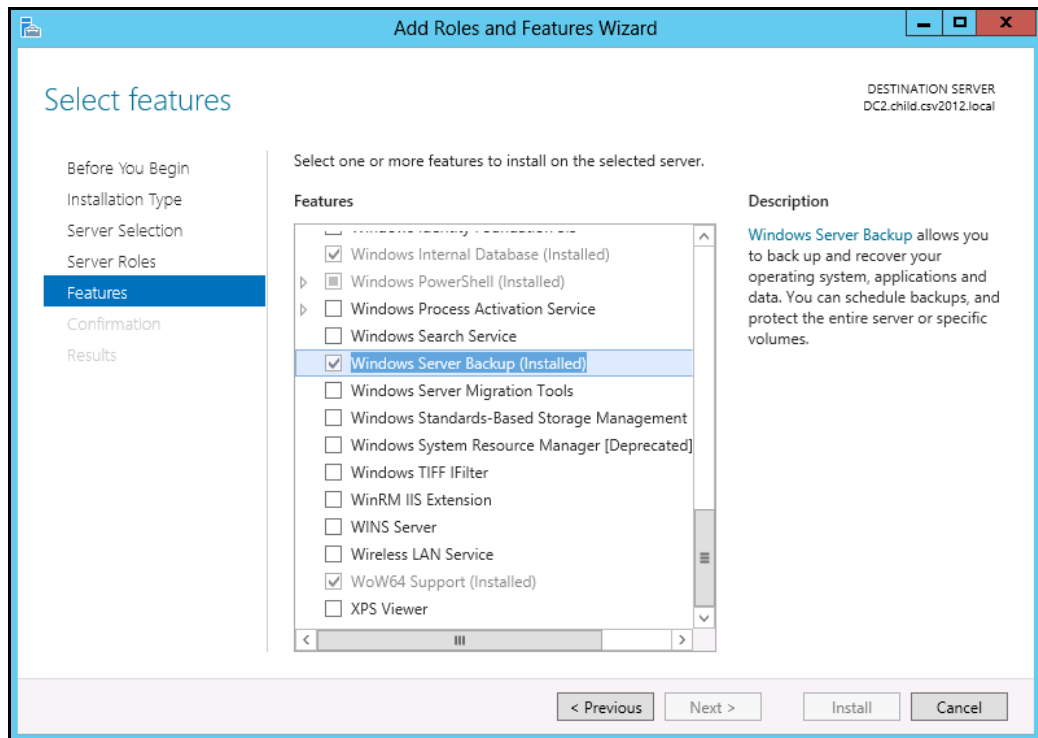
Make sure that your OBM user account has sufficient quota assigned to accommodate the storage for the system state backup.

The size of a set of system state backup data may vary from 10 - 15 GB, depending on the role installed. Contact your backup service provider for details.

Windows Server Backup (WSB) Features

The Windows Server Backup feature must be installed in order for either the system backup to take place.

Confirm in the Server Manager, the feature can be added by selecting **Add Roles and Features**.



1 Latest Service Packs from Microsoft

Ensure that you have the latest service packs installed.

Updates to the Windows operating system improve its performance and resolve known issues with Windows Server Backup.

1 Temporary Storage Location

Make sure that the storage location configure for the system state data is set to a supported location.

Refer to the following KB article for details on the restriction: <https://portal.vsl-net.com/backup/v7/FAQ/5165.pdf>

1 Disk Space Available in Temporary Storage Location

Make sure that there are sufficient disk spaces available in the storage location for the backup set.

The size of a set of system state backup data may vary from 10 - 15 GB, depending on the role installed on the server.

1 System Component Selection

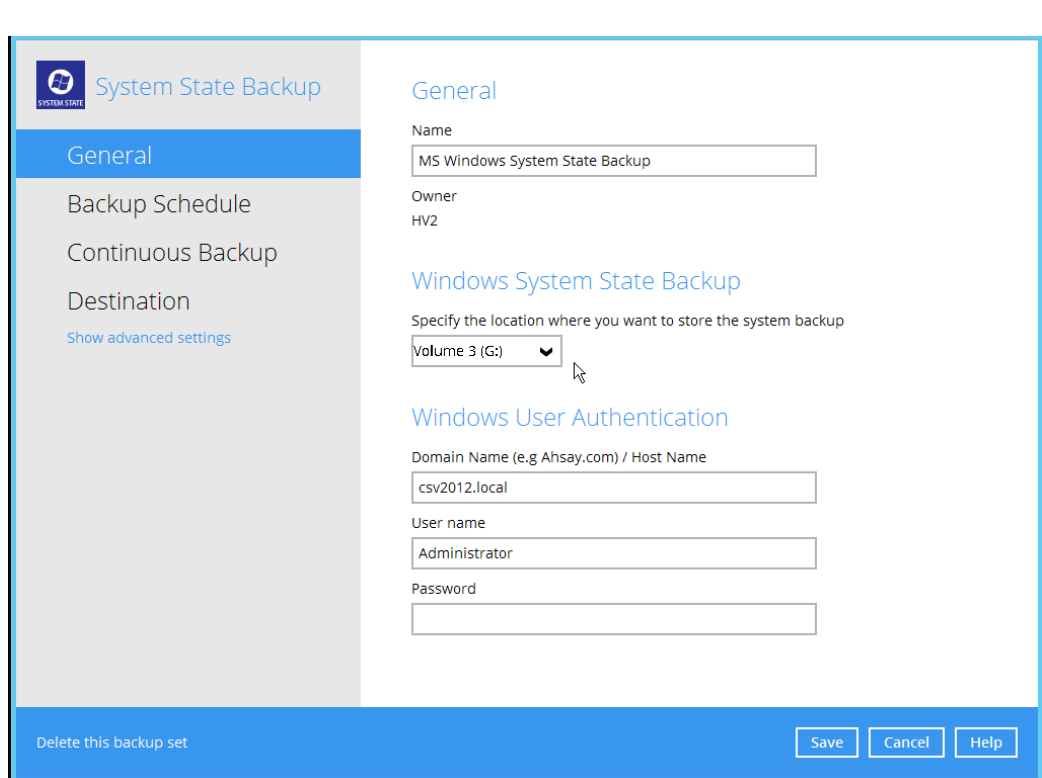
System state backup and restore operations include all system state data; you cannot choose to backup or restore individual components due to dependencies among the system state components.

Reference: <https://msdn.microsoft.com/en-us/library/windows/desktop/bb968830>

2 Best Practice and Recommendation

Please consider the following recommendations:

- 1 It is recommended that the latest version of OBM is installed on server to be backed up.
- 1 For best performance, it's recommended that the temporary storage location of a MS Windows System State backup set is set to a supported local volume, and not to a network volume (e.g. to improve I/O performance).



The screenshot shows the 'System State Backup' configuration window. On the left is a sidebar with navigation options: 'General' (selected), 'Backup Schedule', 'Continuous Backup', 'Destination', and a link for 'Show advanced settings'. The main area is titled 'General' and contains the following fields:

- 'Name': MS Windows System State Backup
- 'Owner': HV2
- 'Windows System State Backup': A section with the instruction 'Specify the location where you want to store the system backup' and a dropdown menu currently set to 'Volume 3 (G:)'. A mouse cursor is pointing at the dropdown.
- 'Windows User Authentication': A section with three fields: 'Domain Name (e.g. Ahsay.com) / Host Name' (containing 'csv2012.local'), 'User name' (containing 'Administrator'), and 'Password' (empty).

At the bottom of the window, there is a blue bar with a link 'Delete this backup set' on the left and three buttons 'Save', 'Cancel', and 'Help' on the right.

- 1 For best performance, consider to increase the memory allocation setting for OBM (Java heap space)

Refer to the following KB article for further instruction: <http://portal.vsl-net.com/backup/v7/FAQ/5003.pdf>

- 1 System Recovery Plan

Consider performing routine system recovery test to ensure your system state backup is setup and performed properly. Performing system recovery test can also help identify potential issues or gaps in your system recovery plan.

For best result, it is recommended that you should keep the test as close as possible to a real situation. Often when a recovery test is to take place, administrators will plan for the test (e.g. reconfigure the test environments,

restoring certain data in advance). For real recovery situation, you will not get a chance to do that.

It's important that you do not try to make the test easier, as the objective of a successful test is not to demonstrate that everything is flawless. There might be flaws identified in the plan throughout the test and it is important to identify those flaws

3 Restore Consideration

Please consider the following before performing a restore:

- Windows Account Permission

To perform recovery using Windows Server Backup, the operating system account that you use, must be a member of the Backup Operators or Administrators group.

- Caution on Recovery to Dissimilar Hardware

You can restore a system state backup to the same physical computer from which the system state backup was created, or to a different physical computer that has the same make, model, and configuration (identical hardware).

Microsoft does not support restoring a system state backup from one computer to a second computer of a different make, model, or hardware configuration.

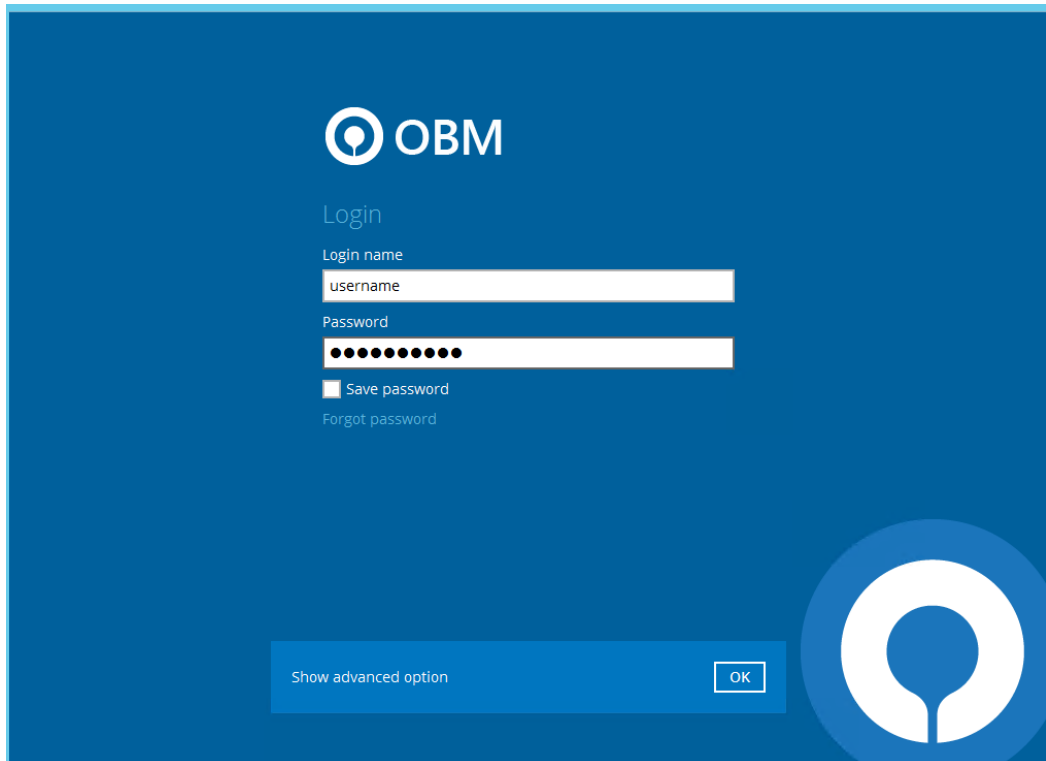
Reference: <http://support.microsoft.com/kb/249694>

4 Starting OBM

4.1 Login to OBM

1. Login to the OBM application user interface.

Double click the OBM desktop icon to launch the application.



2. Enter the **Login name** and **Password** of your OBM account.
3. Click **OK** afterward to login to OBM.

5 Configuring a MS Windows System State Backup Set

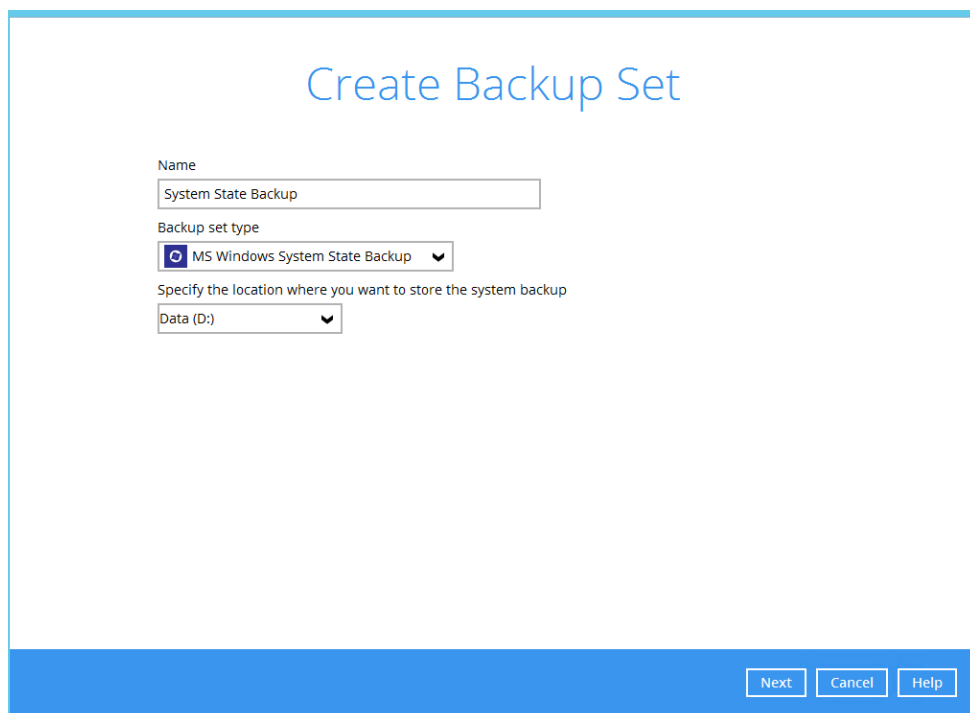
5.1 Create a MS Windows System State Backup Set

1. In the OBM main interface, click **Backup Sets**.



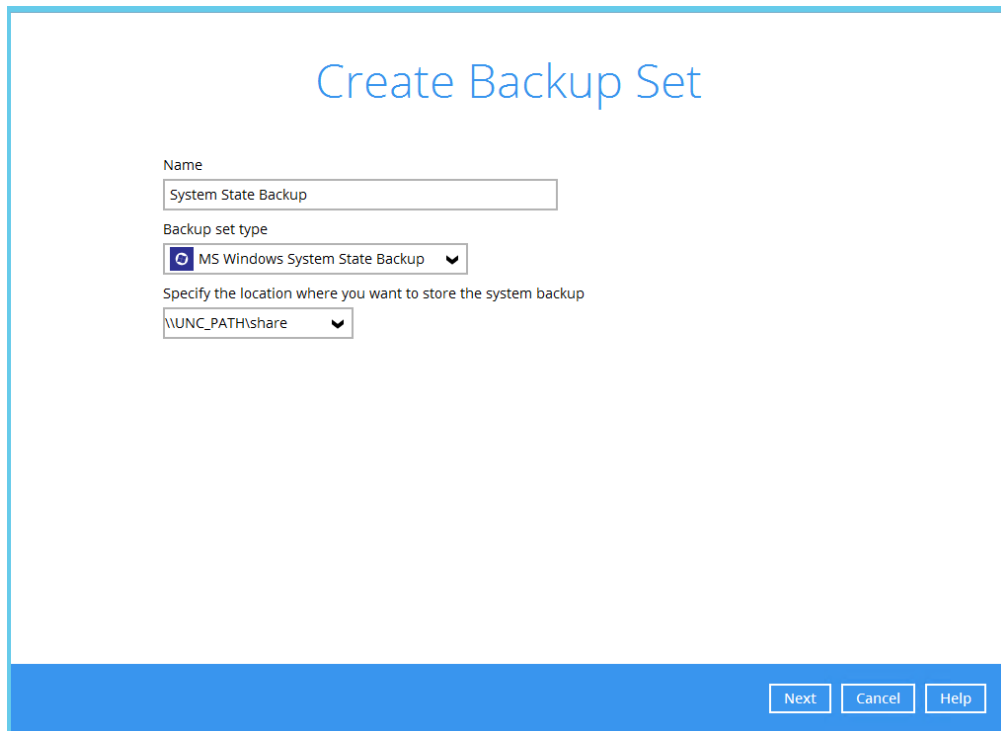
2. Create a MS Windows System State backup set by clicking the "+" icon next to **Add new backup set**.
3. Select **MS Windows System State Backup** as the **Backup set type**, and enter a **Name** for your backup set and select the location where you would like to store the system state backup file during a backup.

Select a local volume from the dropdown menu.

A dialog box titled "Create Backup Set" in blue text. It contains three input fields: "Name" with the text "System State Backup", "Backup set type" with a dropdown menu showing "MS Windows System State Backup" and a plus icon, and "Specify the location where you want to store the system backup" with a dropdown menu showing "Data (D:)". At the bottom right, there are three buttons: "Next", "Cancel", and "Help".

Or

Enter the UNC path to a network volume that is accessible to the client computer.



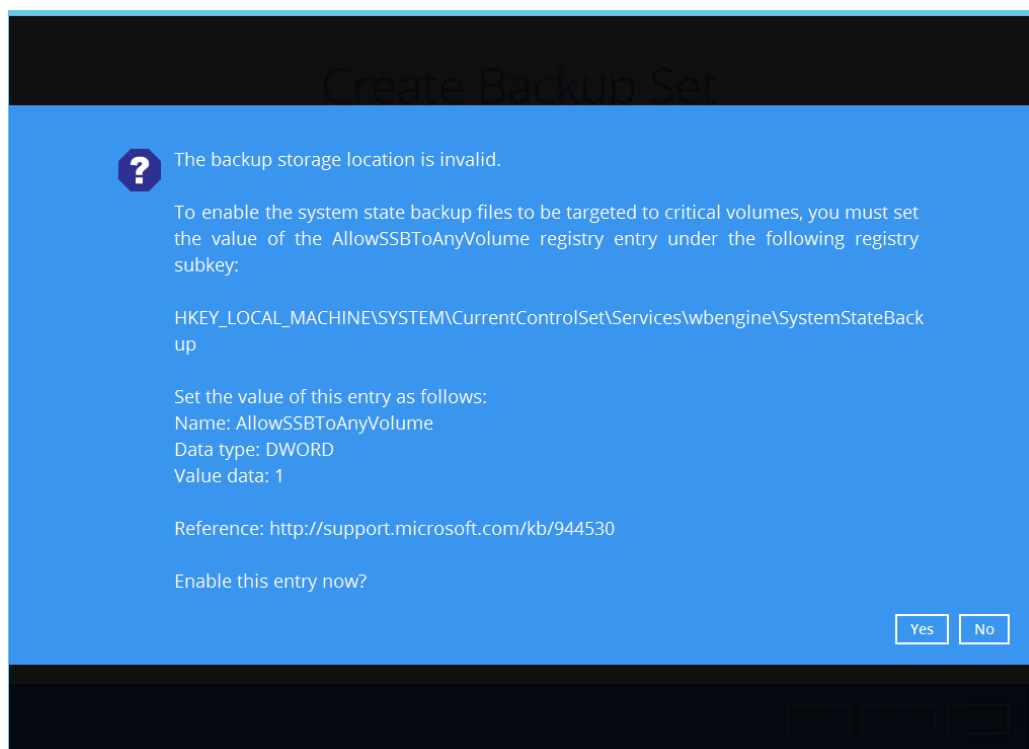
The 'Create Backup Set' dialog box is shown. It has a title bar and a main area with the following fields:

- Name:** A text box containing 'System State Backup'.
- Backup set type:** A dropdown menu with 'MS Windows System State Backup' selected.
- Specify the location where you want to store the system backup:** A dropdown menu with '\\UNC_PATH\share' selected.

At the bottom right, there are three buttons: 'Next', 'Cancel', and 'Help'.

Note: For Windows 2008 Server, the temporary storage location cannot be set to a network path.

Note: If the storage location is set to a critical volume (e.g. system volume), the following message will be displayed:



The 'Create Backup Set' dialog box is shown with a blue background and a black header. A message box with a question mark icon is displayed:

The backup storage location is invalid.

To enable the system state backup files to be targeted to critical volumes, you must set the value of the AllowSSBToAnyVolume registry entry under the following registry subkey:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\wbengine\SystemStateBackup

Set the value of this entry as follows:

- Name: AllowSSBToAnyVolume
- Data type: DWORD
- Value data: 1

Reference: <http://support.microsoft.com/kb/944530>

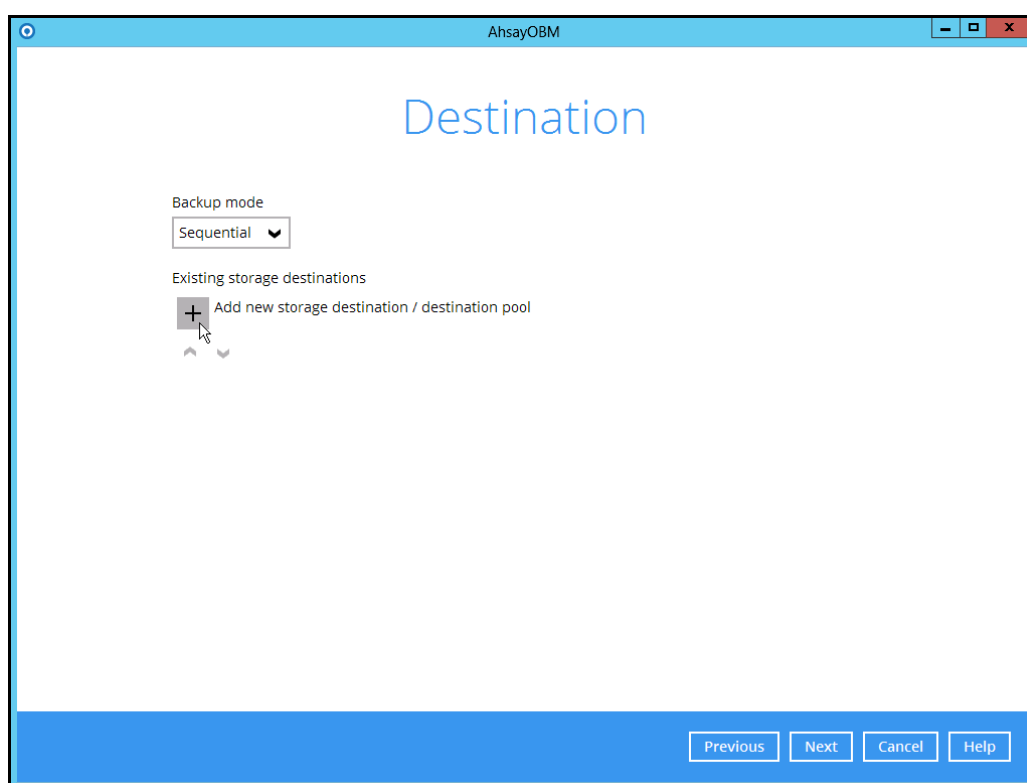
Enable this entry now?

At the bottom right, there are two buttons: 'Yes' and 'No'.

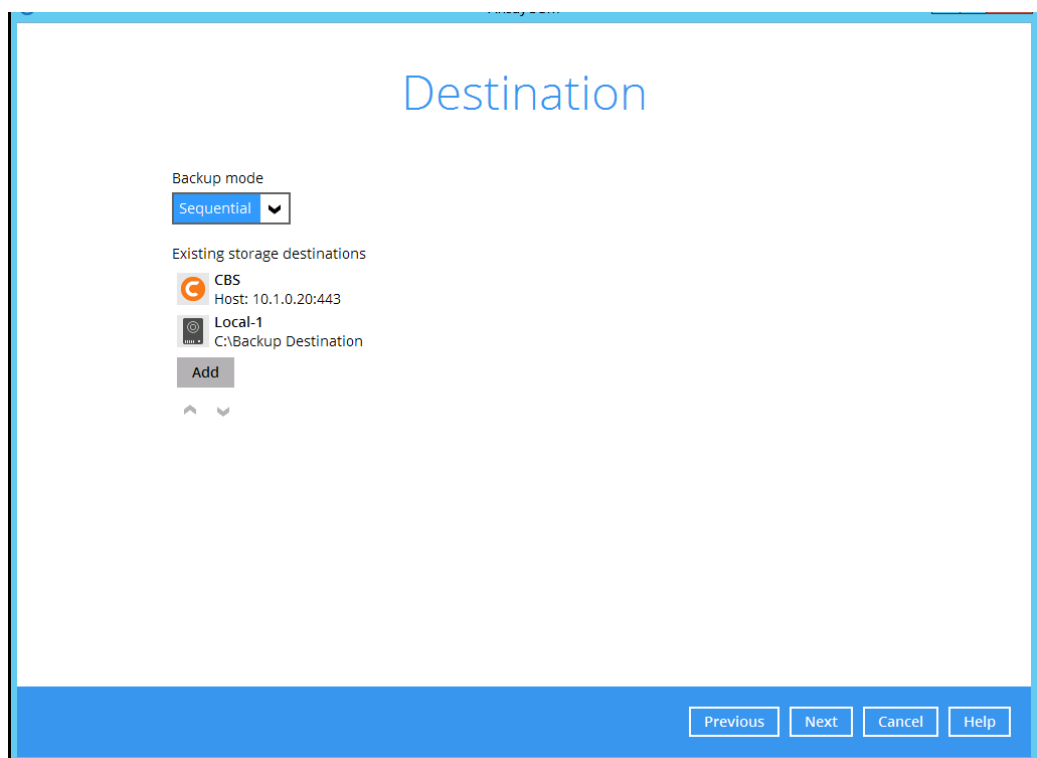
Click **Yes** for OBM to enable the registry entry, or click **No**, then change the storage location setting to another location.

Refer to the following KB article for details on the restriction: <https://portal.vsl-net.com/backup/v7/FAQ/5165.pdf>

4. In the Schedule menu, configure a backup schedule for backup job to run automatically at your specified time interval. Click **Add** to add a new schedule, then click **Next** to proceed afterward.
5. In the Destination menu, select a backup destination where the backup data will be stored. Click the “+” icon next to **Add new storage destination / destination pool** to add a local destination e.g. USB.

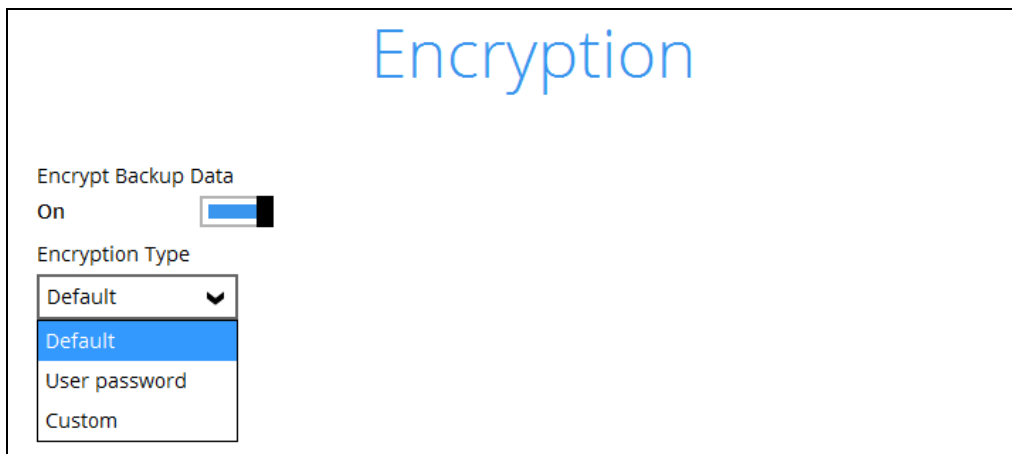


6. Continue by adding another destination for the backup set, or click **Next** to proceed.



Note: Multiple backup destinations can be configured for a single backup set.

7. In the Encryption window, the default **Encrypt Backup Data** option is enabled with an encryption key preset by the system which provides the most secure protection.

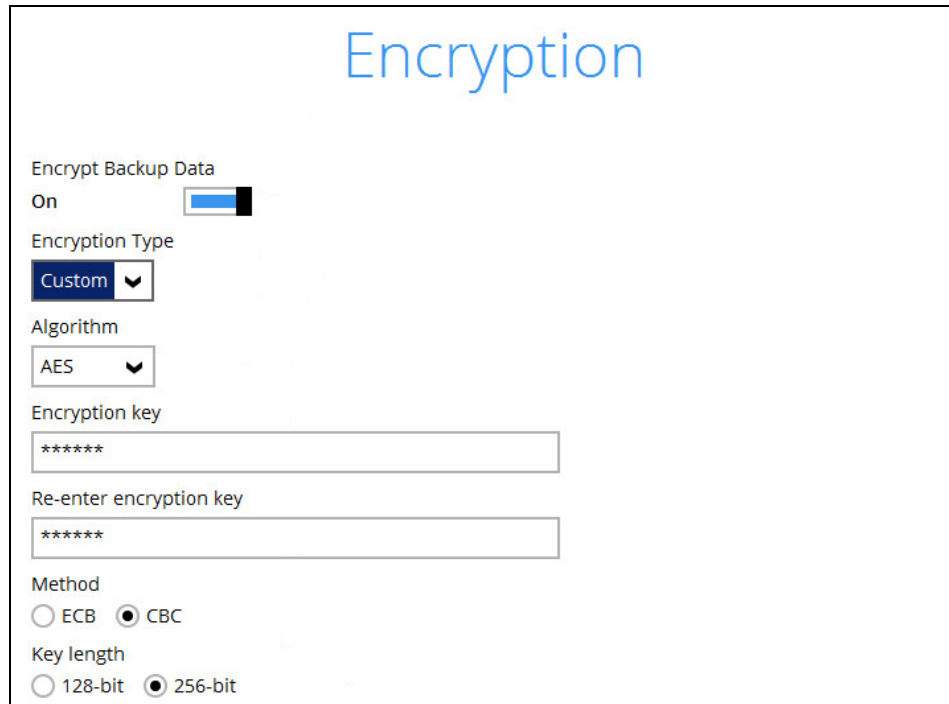


You can choose from one of the following three Encryption Type options:

- **Default** – an encryption key with 44 alpha numeric characters will be randomly generated by the system
- **User password** – the encryption key will be the same as the login password of your OBM at the time when this backup set is created. Please be reminded that if you change the OBM login password later, the

encryption keys of the backup sets previously created with this encryption type will remain unchanged.

- **Custom** – you can customize your encryption key, where you can set your own algorithm, encryption key, method and key length.

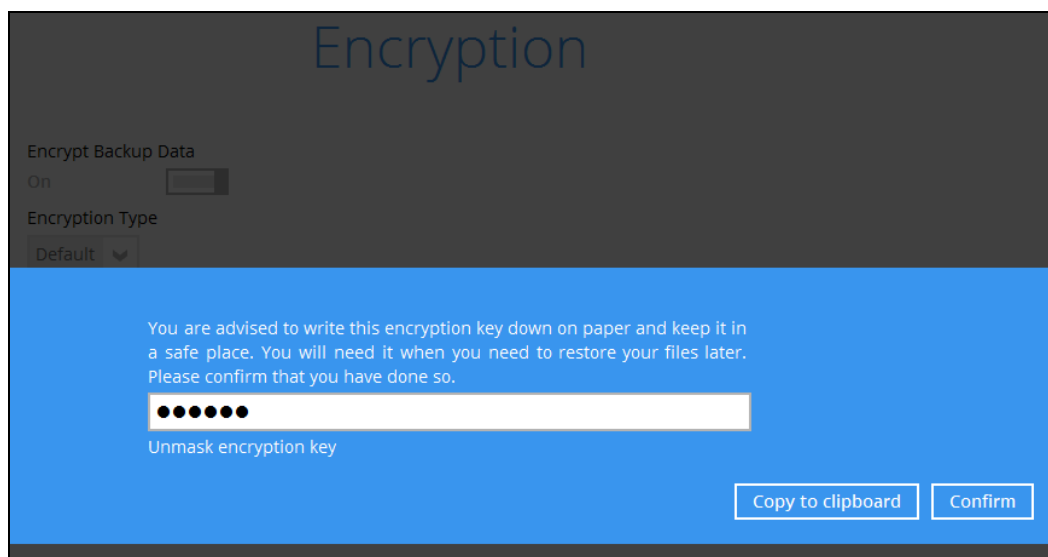


The screenshot shows the 'Encryption' settings window. At the top, the word 'Encryption' is displayed in a large blue font. Below it, the 'Encrypt Backup Data' toggle is set to 'On'. The 'Encryption Type' dropdown menu is set to 'Custom'. The 'Algorithm' dropdown menu is set to 'AES'. The 'Encryption key' field is masked with seven asterisks. The 'Re-enter encryption key' field is also masked with seven asterisks. The 'Method' section has two radio buttons: 'ECB' and 'CBC', with 'CBC' selected. The 'Key length' section has two radio buttons: '128-bit' and '256-bit', with '256-bit' selected.

Click **Next** when you are done setting.

WARNING: If a note of the encryption key is NOT taken, and the key is LOST, the data will be irretrievable. We recommend changing the DEFAULT encryption key to something memorable.

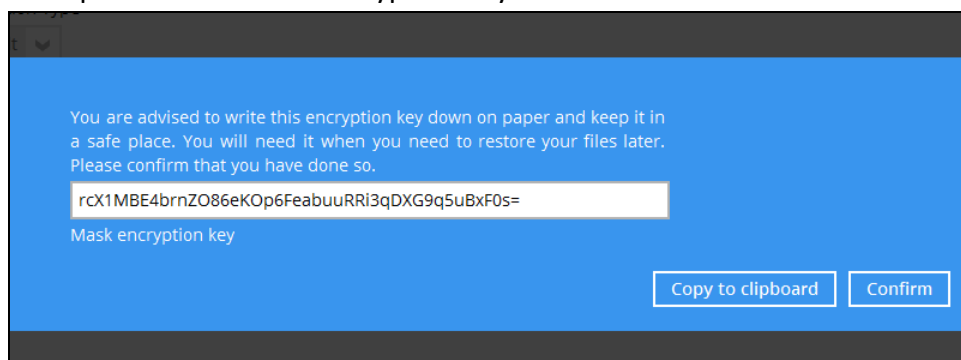
8. If you have enabled the Encryption Key feature in the previous step, the following pop-up window shows, no matter which encryption type you have selected.



The screenshot shows the 'Encryption' pop-up window. At the top, the word 'Encryption' is displayed in a large blue font. Below it, the 'Encrypt Backup Data' toggle is set to 'On'. The 'Encryption Type' dropdown menu is set to 'Default'. The main area of the window is blue and contains the following text: 'You are advised to write this encryption key down on paper and keep it in a safe place. You will need it when you need to restore your files later. Please confirm that you have done so.' Below this text is a text input field containing seven asterisks. Below the input field is the label 'Unmask encryption key'. At the bottom right of the window are two buttons: 'Copy to clipboard' and 'Confirm'.

The pop-up window has the following three options to choose from:

- **Unmask encryption key** – The encryption key is masked by default. Click this option to show the encryption key.



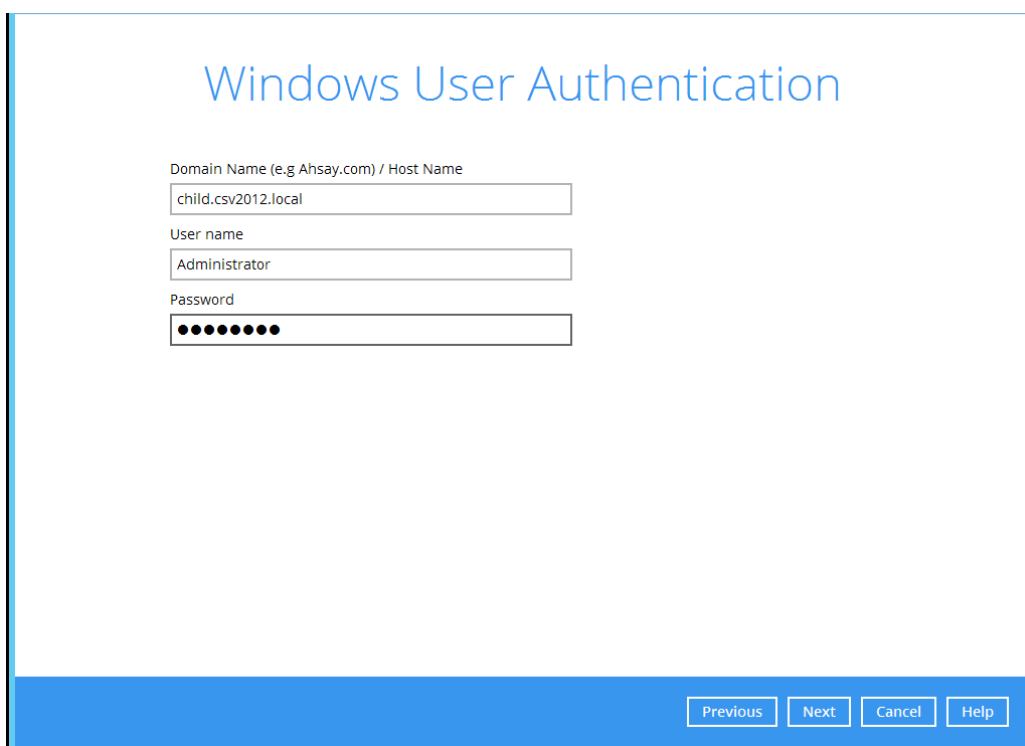
A screenshot of a blue pop-up window. At the top, it says: "You are advised to write this encryption key down on paper and keep it in a safe place. You will need it when you need to restore your files later. Please confirm that you have done so." Below this is a text box containing the encryption key: "rcX1MBE4brnZO86eKOp6FeabuuRRI3qDXG9q5uBxF0s=". Below the text box is a label "Mask encryption key". At the bottom right, there are two buttons: "Copy to clipboard" and "Confirm".

- **Copy to clipboard** – Click to copy the encryption key, then you can paste it in another location of your choice.

- **Confirm** – Click to exit this pop-up window and proceed to the next step.

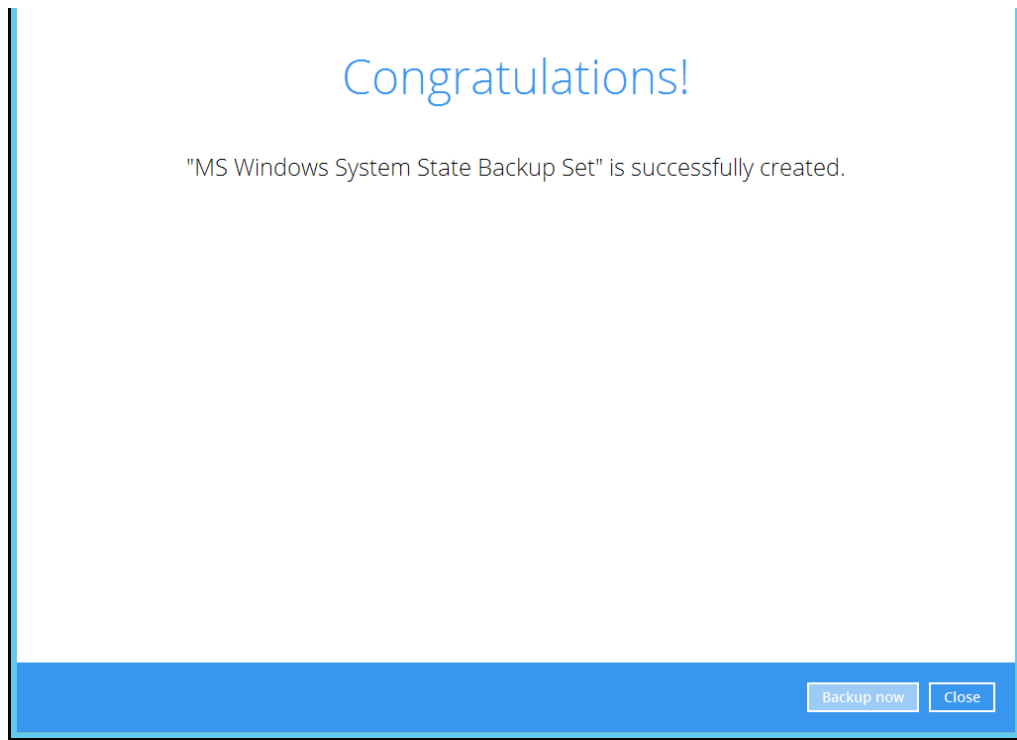
WARNING: If a note of the encryption key is NOT taken, and the key is LOST, the data will be irretrievable. We recommend changing the DEFAULT encryption key to something memorable.

9. Enter the **Domain Name / Host Name** of the computer, **User Name** and **Password** of the Windows account that will be running the backup.



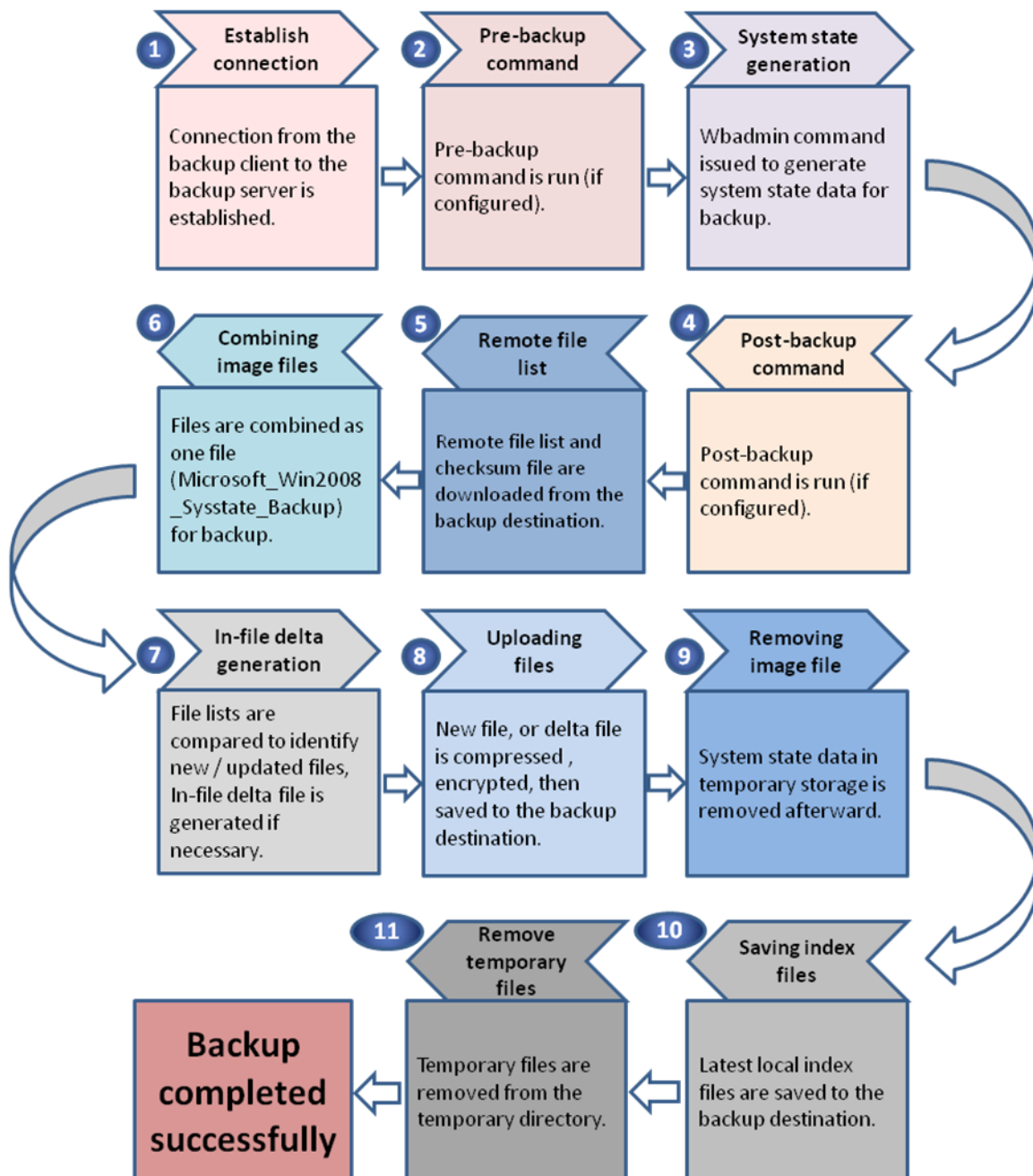
A screenshot of a "Windows User Authentication" window. The title "Windows User Authentication" is at the top in blue. Below it are three input fields: "Domain Name (e.g Ahsay.com) / Host Name" with the value "child.csv2012.local", "User name" with the value "Administrator", and "Password" with masked characters. At the bottom right, there are four buttons: "Previous", "Next", "Cancel", and "Help".

10. Click **Next** to create the backup set.
11. The following screen is displayed when the new MS Windows System State backup set is created successfully.



6 Overview on the Backup Process

The following steps are performed during a MS Windows System State backup job.



7 Running a Backup

7.1 Start a Manual Backup

1. Click the **Backup** icon on the main interface of OBM.



2. Select the backup set which you would like to start a backup for.



3. If you would like to modify the In-File Delta type, Destinations and Retention Policy Settings, click **Show advance option**.
4. Click **Backup** to start the backup.

7.2 Configure Backup Schedule for Automated Backup

1. Click the Backup Sets icon on the OBM main interface.



2. Select the backup set that you want to create a backup schedule for.
3. Click **Backup Schedule**, then create a new backup schedule by clicking **Add**.
4. Configure the backup schedule settings, then click **OK** to proceed.
5. Click **Save** to confirm your settings.

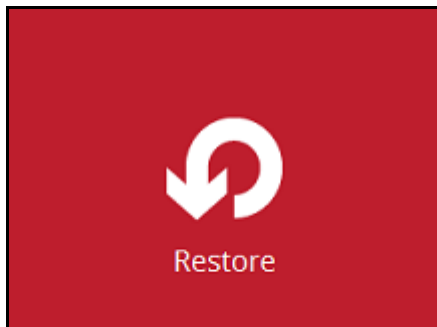
8 Restore with a MS Windows System State Backup Set

8.1 Login to OBM

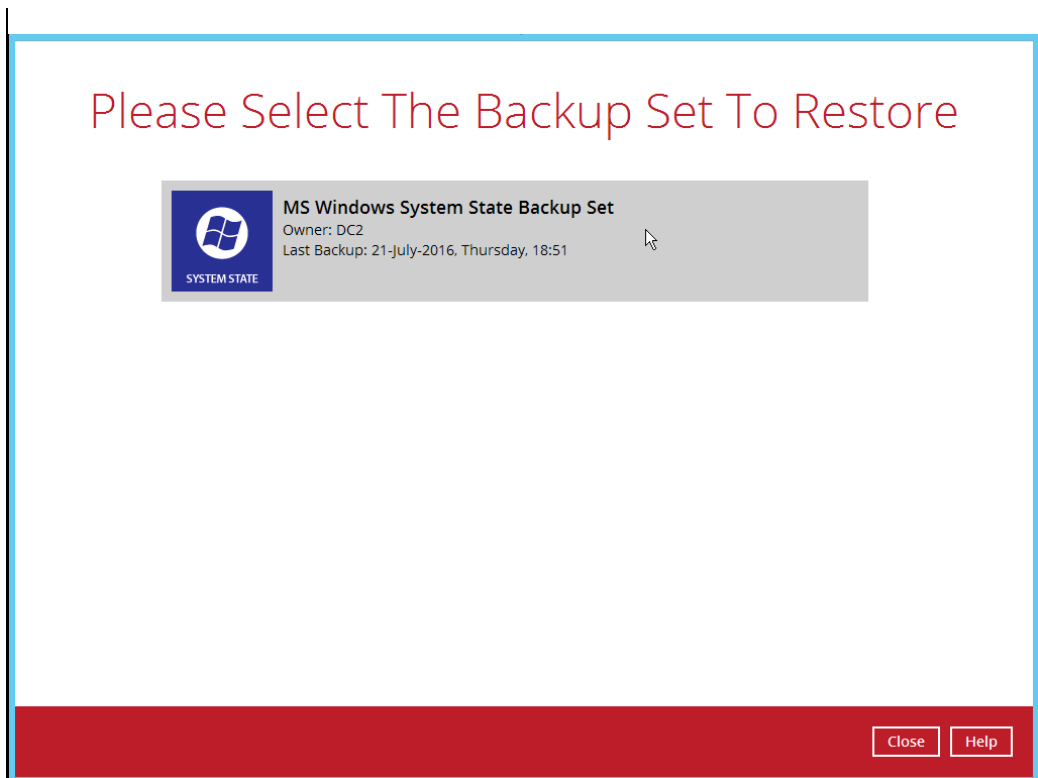
Login to the OBM application according to the instruction provided in the chapter on [Starting OBM](#).

8.2 Restore the System State Data

1. Click the **Restore** icon on the main interface of OBM.



2. Select the backup set that you would like to restore the system state data from.



3. Select the backup destination that contains the system state data that you would like to restore.

Select The Destination From Which To Restor...

MS Windows System State Backup Set

 Local-1
G:\Backup Destination

 CBS
Host: 10.1.0.10:80

Close

Help

4. Select to restore from a specific backup job, or the latest job available from the **Select what to restore** drop down menu.
5. Select System State backup file, then click **Next** to proceed.

Select Your Files To Be Restored

Select what to restore

Choose from files as of job ▼

2016-07-21 ▼

Latest ▼

Show filter

Folders		Name	Size	Date modified
 Local-1		☒ Microsoft_Win2008_Sysstate_Backup	7,994,7...	2016-07-21 19:00

Search

Items per page 50 ▼

Page 1 / 1 ▼

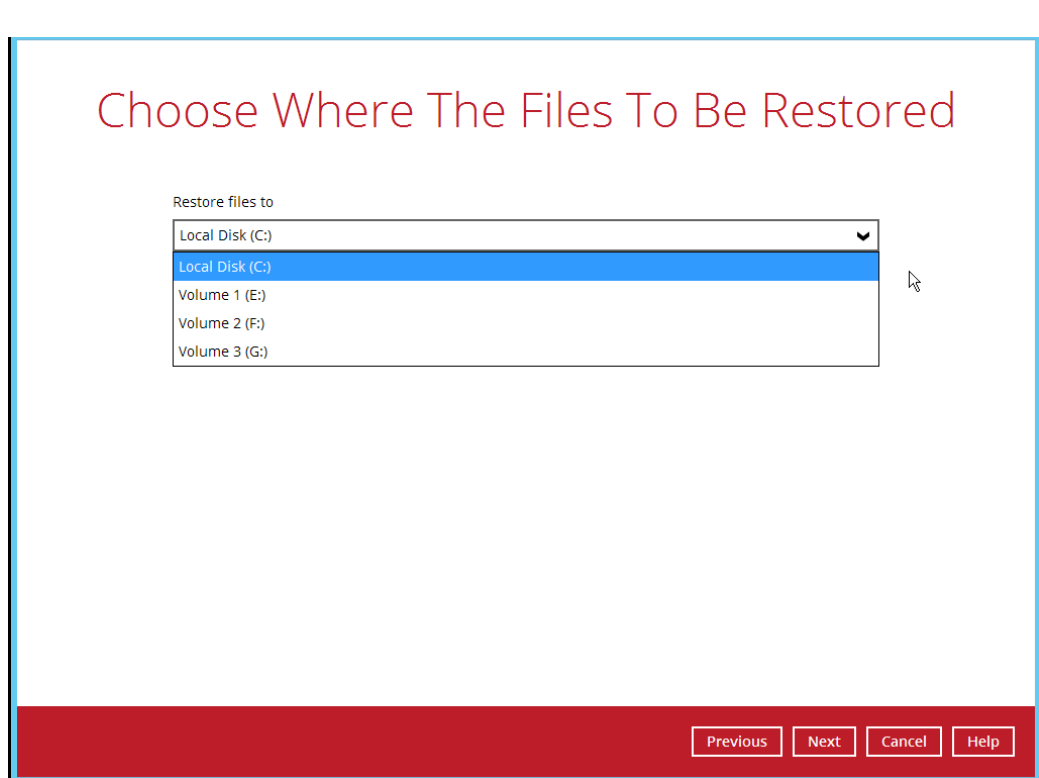
Previous

Next

Cancel

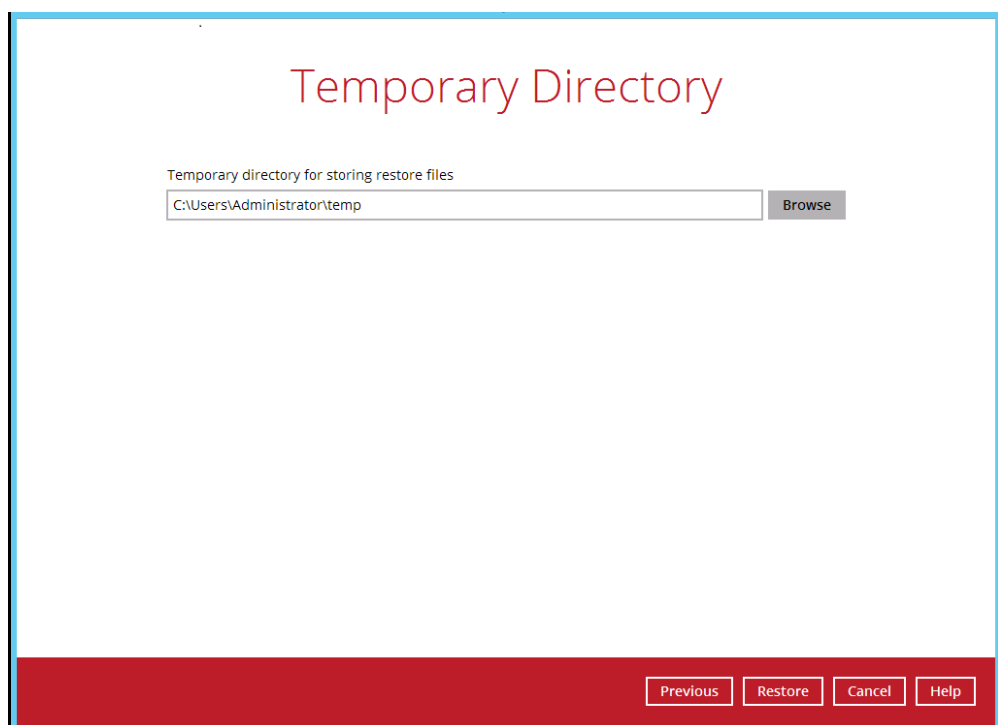
Help

6. Select to restore the system state data to a local volume or to a removable drive.

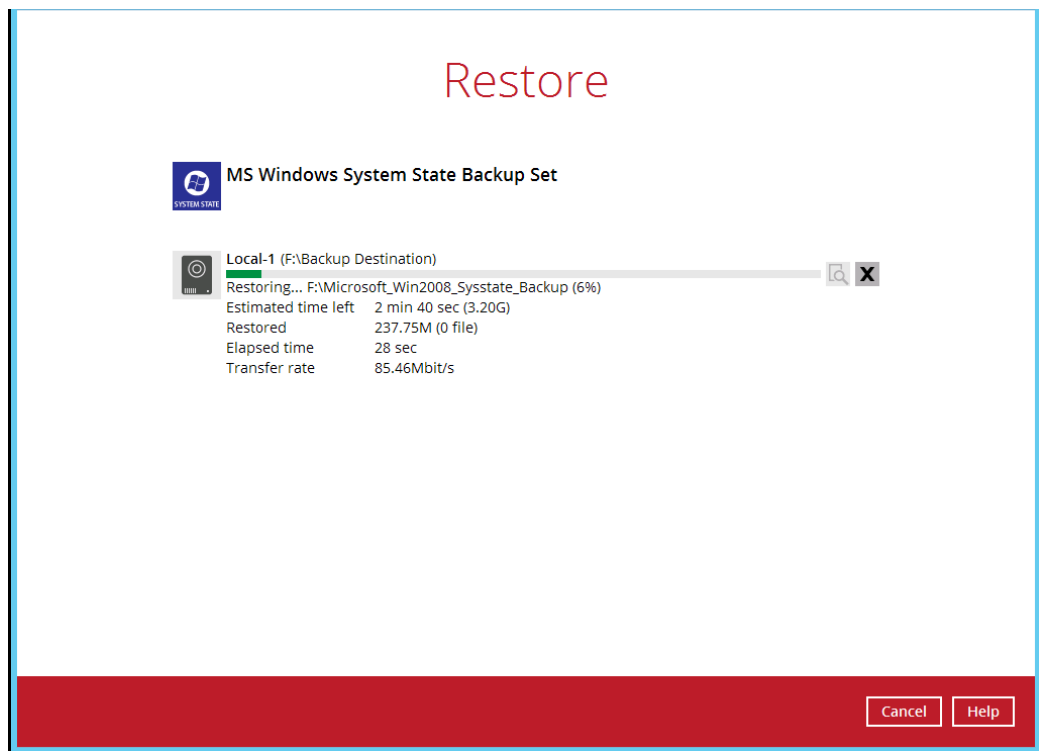


Click **Next** to proceed.

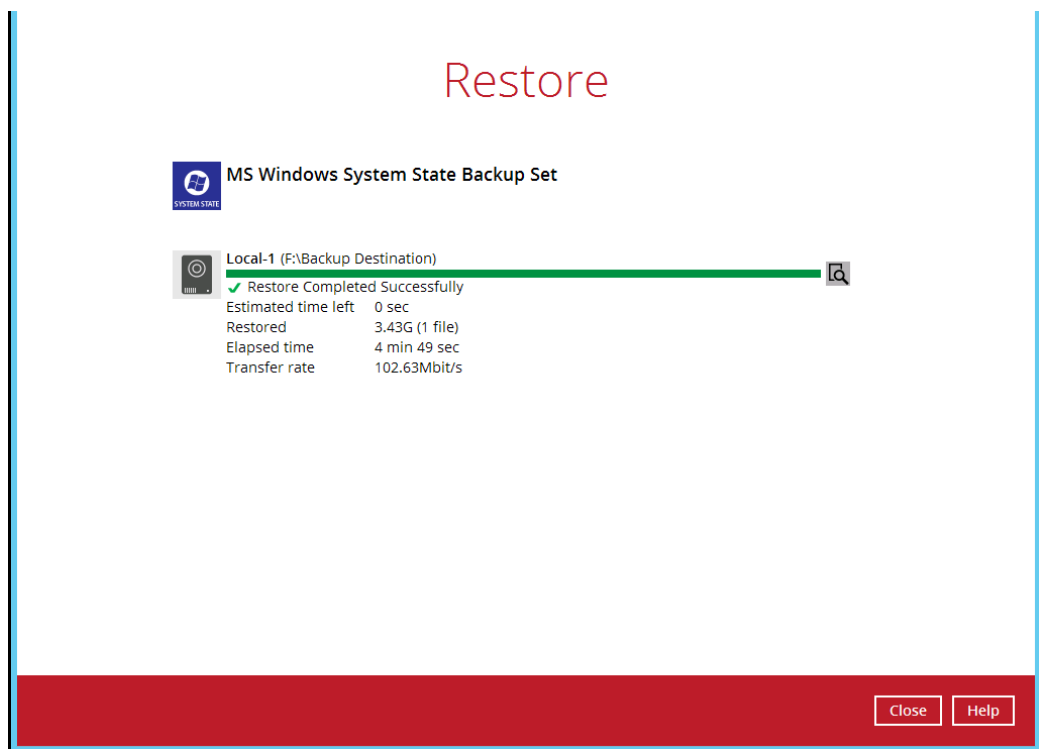
7. Select the temporary directory for storing temporary files.



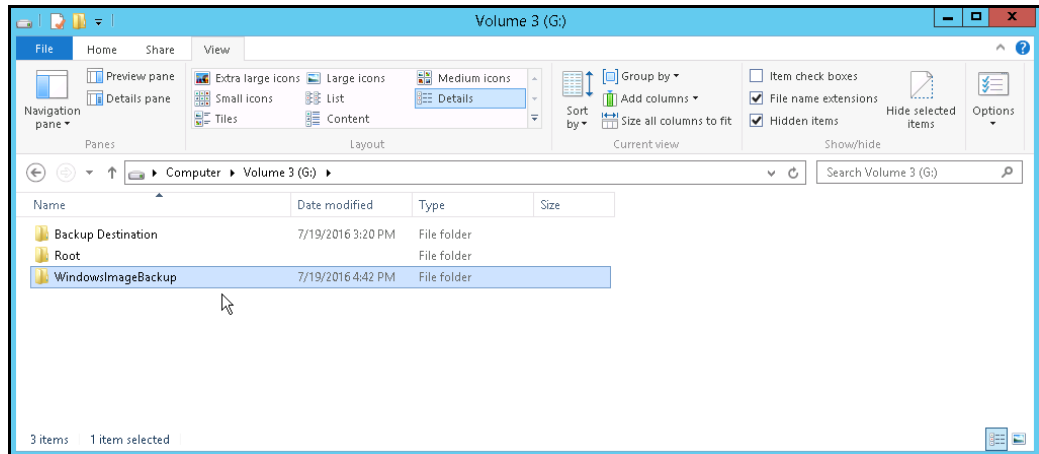
- Click **Restore** to start the restoration.



- The following screen is displayed when the system state data are restored successfully.



10. The restored system state data are stored in the **WindowsImageBackup** folder in the restore location.



Important: In addition to the system state data, the **WindowsImageBackup** folder includes catalog files that contain information about all backups in there up to the current backup, and MediaId, that contains the identifier for the backup storage location.

This information is required to perform a recovery. **Do not** alter the directory structure or delete any file / folder within the **WindowsImageBackup** folder

11. Copy the **WindowsImageBackup** folder and its content to the server that you want to perform the restore for, or to a network drive that is accessible to the server.

The folder must be copied to the root level of a volume (e.g. top-most level), unless you are copying the folder to a network drive.

12. Continue to the next section of the guide.

8.3 Apply the System State Data

Before you begin, make sure that the system state data restored with OBM are copied to a local disk (where you will perform the restore), or in a remote shared folder.

For Windows Server 2008 R2 or later, you can use the Recovery Wizard in Windows Server Backup or wadmin command to recover the system state.

For Windows Server 2008, you can only use the wadmin command to recover the system state.

For instructions specific to recovering Active Directory Domain Services, see <http://go.microsoft.com/fwlink/?LinkId=143754>

Note: Refer to the following page for syntax of the *wbadmin* command:
<http://go.microsoft.com/fwlink/?LinkId=140216>

To determine what can be recovered from your restored system state data, enter the following command in an elevated command prompt:

```
wbadmin get versions  
[-backupTarget:{<BackupTargetLocation> | <NetworkSharePath>}]
```

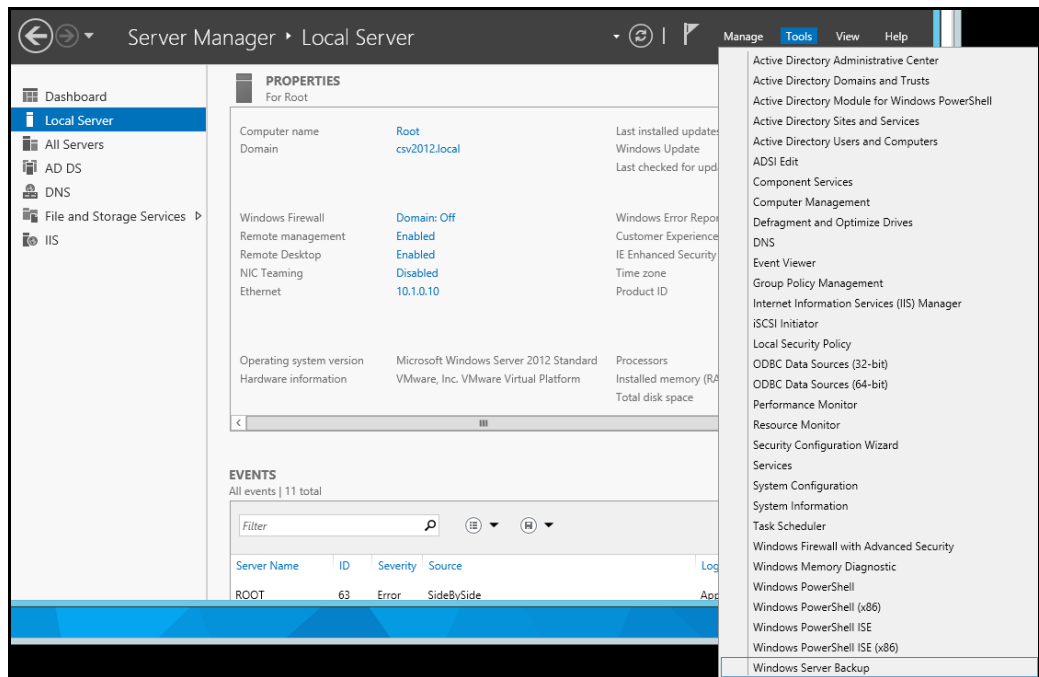
Example (system state restored to G: volume):

```
C:\Users\Administrator>wbadmin get versions -backupTarget:g:  
wbadmin 1.0 - Backup command-line tool  
(C) Copyright 2012 Microsoft Corporation. All rights reserved.  
  
Backup time: 7/19/2016 1:46 PM  
Backup target: 1394/USB Disk labeled Volume 3(G:)  
Version identifier: 07/19/2016-05:46  
Can recover: Volume(s), File(s), Application(s), Bare Metal Recovery, System State  
Snapshot ID: {feb9079c-9459-4034-908f-7b5a9b0bb1e5}
```

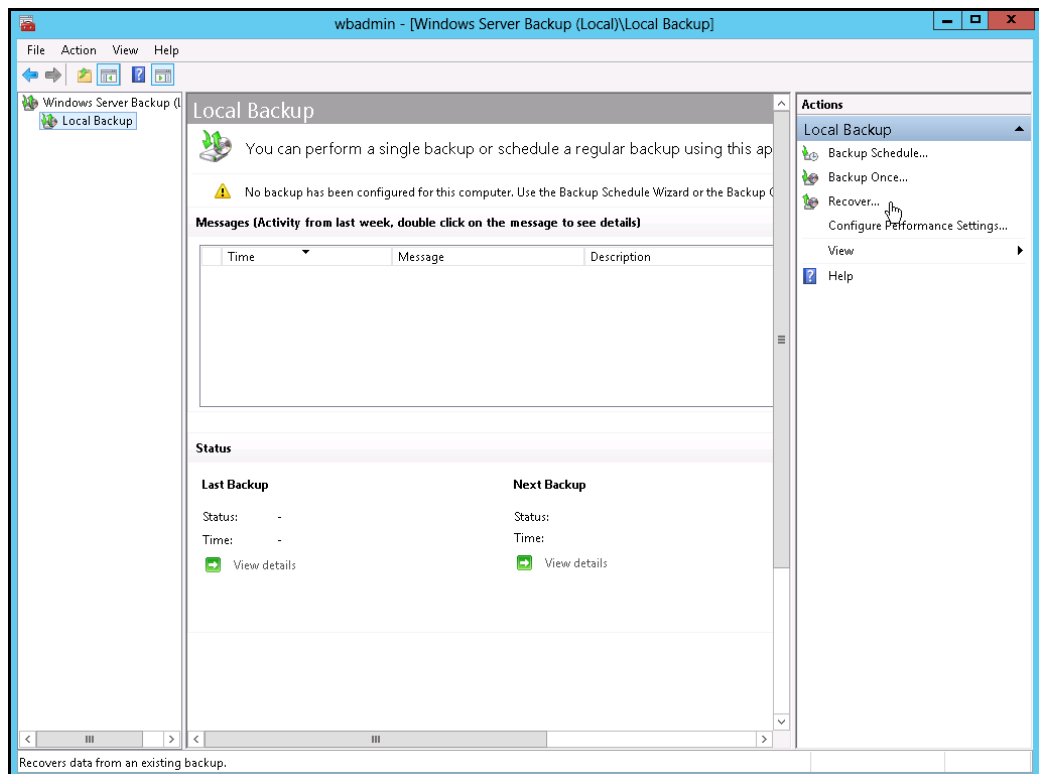
Note: File and folder recovery is not possible from a system state backup performed on Windows Server 2008.

To recover the system state using the Windows Server Backup user interface.

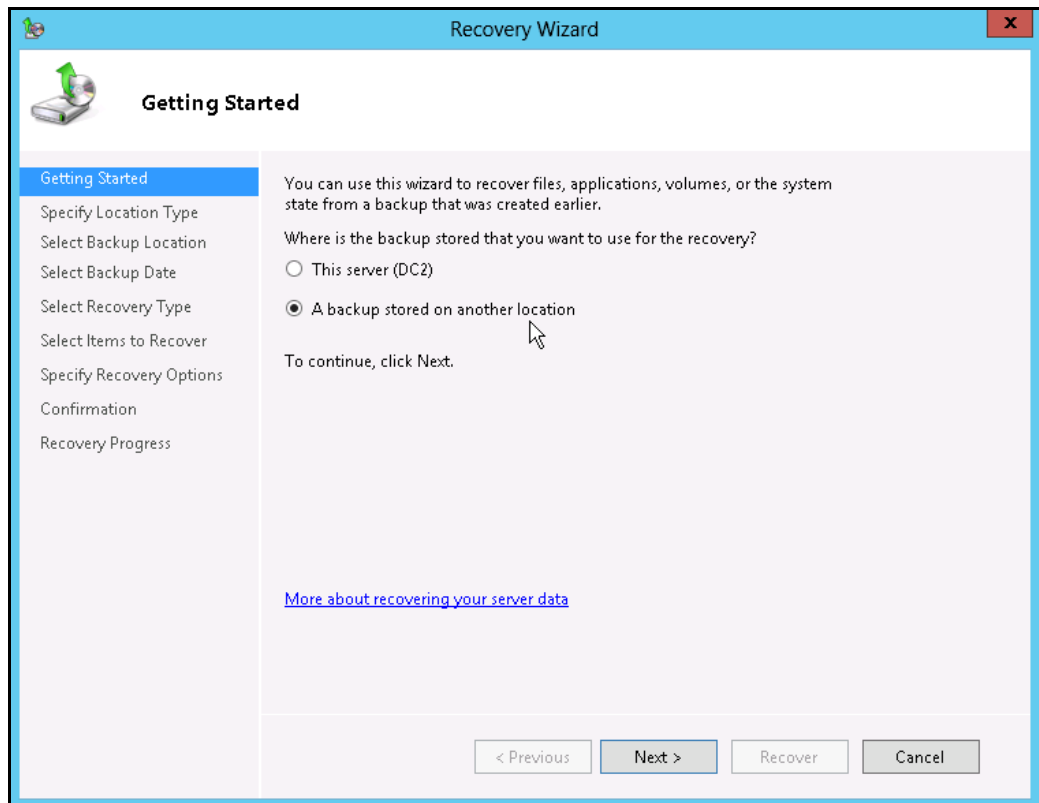
1. Open **Windows Server Backup** from **Administrative Tools** or **Server Manager**.



2. In the **Actions** panel under Windows Server Backup, click **Recover...**



3. On the **Getting Started** page, select **A backup stored on another location**, then click **Next**.



4. On the **Specify Location Type** page, select
 - ➊ Click **Local drives**, if the system state data were copied to a local volume on the server.
 - ➋ Click **Remote shared folder**, if the system state data were copied to a network path accessible to this server.

Specify Location Type

Getting Started
Specify Location Type
 Select Backup Location
 Select Backup Date
 Select Recovery Type
 Select Items to Recover
 Specify Recovery Options
 Confirmation
 Recovery Progress

What is the location type where the backup is stored?

☒ Local drives
 Example: local disk (D:), DVD drive (E:)

☐ Remote shared folder
 Example: \\MyFileServer\SharedFolderName

< Previous Next > Recover Cancel

5. On the **Select Backup Location** page, select the volume that contains the system state data.

Select Backup Location

Getting Started
 Specify Location Type
Select Backup Location
 Select Backup Date
 Select Recovery Type
 Select Items to Recover
 Specify Recovery Options
 Confirmation
 Recovery Progress

Choose the volume or drive that contains the backup. An external disk attached to this server is listed as a volume. If your backup is on a DVD and spans multiple DVDs, make sure that the last DVD of the backup is inserted into a DVD drive.

Backup location: Volume 2 (F:)

Total space in location: 59.87 GB

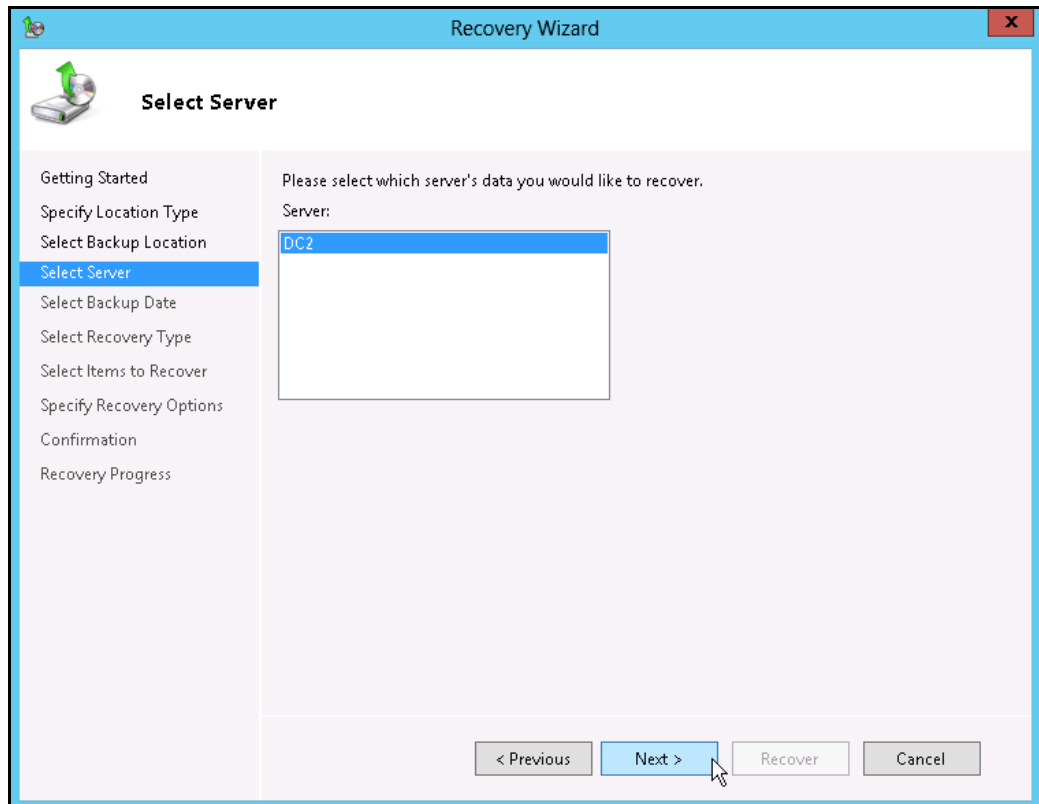
Free space in backup location: 48.70 GB

< Previous Next > Recover Cancel

Note: Assuming that the **WindowsImageBackup** folder was copied to the following

F:\ WindowsImageBackup

6. On the **Select Server** page, select the server whose data you want to recover.



7. On the **Select Backup Date** page, select the point in time of the backup you want to restore from.

Recovery Wizard

Select Backup Date

Getting Started
Specify Location Type
Select Backup Location
Select Server
Select Backup Date
Select Recovery Type
Select Items to Recover
Specify Recovery Options
Confirmation
Recovery Progress

Oldest available backup: 7/21/2016 6:51 PM
Newest available backup: 7/21/2016 6:51 PM

Available backups
Select the date of a backup to use for recovery. Backups are available for dates shown in bold.

Sun	Mon	Tue	Wed	Thu	Fri	Sat
3	4	5	6	7	1	2
10	11	12	13	14	8	9
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Backup date: 7/21/2016
Time: 6:51 PM
Recoverable items: [System state](#)

< Previous Next > Recover Cancel

- On the **Select Recovery Type** page, click **System state**.

Recovery Wizard

Select Recovery Type

Getting Started
Specify Location Type
Select Backup Location
Select Server
Select Backup Date
Select Recovery Type
Select Location for System...
Confirmation
Recovery Progress

What do you want to recover?

☐ Files and folders
You can browse volumes included in this backup and select files and folders.

☐ Hyper-V
You can restore virtual machines to their original location, another location or copy the virtual hard disk files of a virtual machine.

☐ Volumes
You can restore an entire volume, such as all data stored on C:.

☐ Applications
You can recover applications that have registered with Windows Server Backup.

☒ System state
You can restore just the system state.

[More about performing recoveries](#)

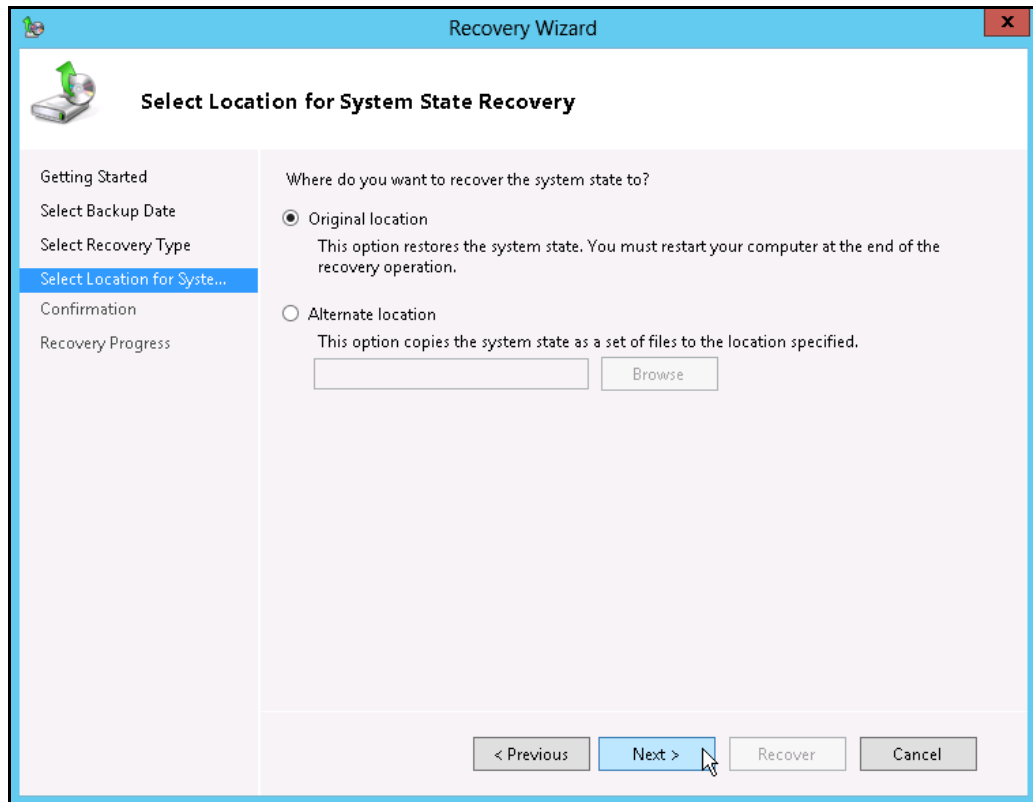
< Previous Next > Recover Cancel

- On the **Select Location for System State Recovery** page, select

- **Original location**, to restore the system state to the same physical computer from which the system state backup was created

Or

- **Alternate location**, to restore a copy of the system state as a set of files.



Note: The options displayed are different for system state containing Active Directory Domain Services.

You will also need to start the server in Directory Services Restore Mode (DSRM) to restore system state data containing Active Directory Domain Services.

For instructions specific to recovering system state to Active Directory server, see <http://go.microsoft.com/fwlink/?LinkId=143754>

Recovery Wizard

Select Location for System State Recovery

Getting Started
Specify Location Type
Select Backup Location
Select Server
Select Backup Date
Select Recovery Type
Select Location for System...
Confirmation
Recovery Progress

Where do you want to recover the system state of this Active Directory backup to?

☐ Original location
This option restores the system state. You must restart your computer at the end of the recovery operation.
☐ Perform an authoritative restore of Active Directory files.
This recovery option will reset all replicated content on this Domain Controller including SYSVOL. Other replicated folders on this server will also be affected by this recovery.

☒ Alternate location
This option copies the system state as a set of files to the location specified.
F:\Restore Destination
☐ Restore as Install From Media (IFM) files
Select this checkbox if you are using the IFM feature to copy the system state files to install an Active Directory database.

< Previous Next > Recover Cancel

10. On the **Confirmation** page, review the details, and then click **Recover** to restore the specified items.

Recovery Wizard

Confirmation

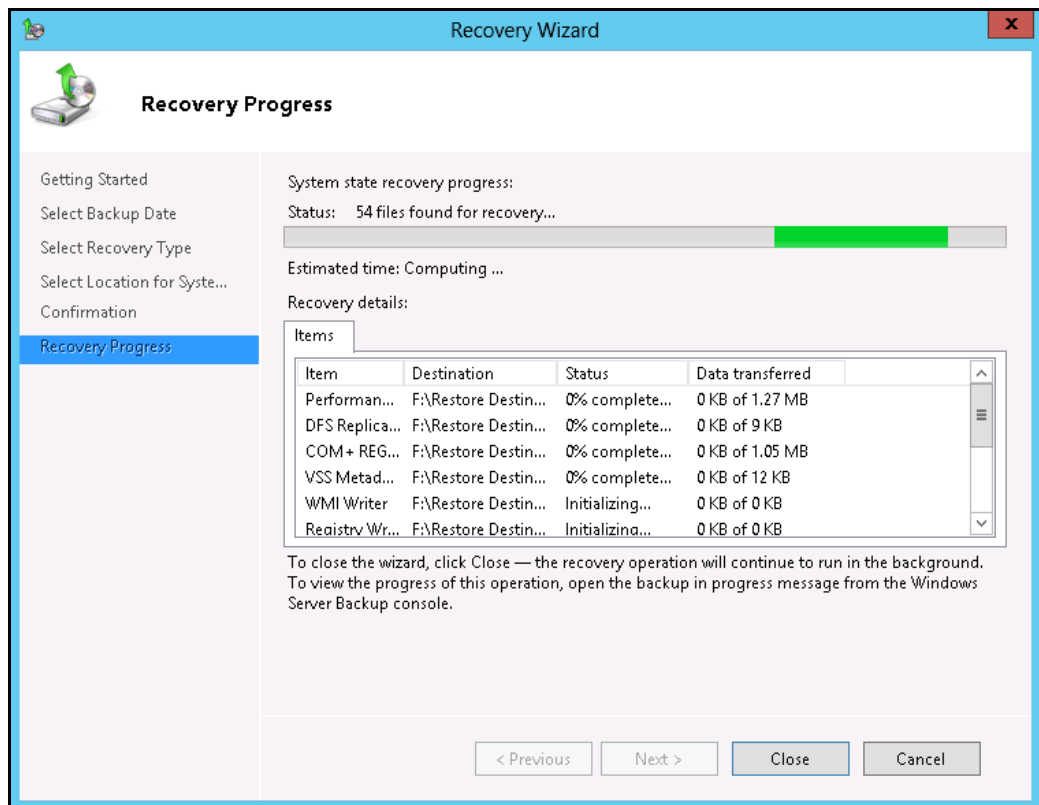
Getting Started
Select Backup Date
Select Recovery Type
Select Location for System...
Confirmation
Recovery Progress

From backup: 7/21/2016 6:51 PM
Recovery items:
System state

Recovery destination: F:\Restore Destination

< Previous Next > **Recover** Cancel

11. On the **Recovery progress** page, the status and result of the recovery operation is displayed.



Important: For restore to **Original location**, the system state recovery cannot be stopped once it is started, or the system could become unbootable.