Ahsay Backup

Ahsay Online Backup Manager v9

Microsoft Exchange 2013 / 2016 / 2019 (EWS)

Mail Level Backup & Restore Guide

Ahsay Systems Corporation Limited

27 January 2023

A wholly owned subsidiary of
Ahsay Backup Software Development Company Limited
HKEx Stock Code: 8290

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Revision History

Date	Descriptions	Version
25 January 2022	▪ Ch. 4 – updated instructions	9.1.0.0
27 January 2023	▪ Ch. 3.1.3 – updated restore instructions	9.5.2.0

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1 Overview

1.1 Introduction

This user guide aims at providing detailed information for backing up and restoring individual mail items and public folder items stored in Microsoft Exchange Server 2013 / 2016 / 2019 with AhsayOBM, also known as the Mail Level backup.

Mail Level Backup must be utilized in conjunction with full Information Store Backup as Mail Level backup for Microsoft Exchange Server is not designed to fully protect an Exchange Server, but to facilitate easy backup and fast restoration of individual emails, contacts, calendars or public folder, etc.

AhsayOBM supports standalone backup option and Database Availability Group (DAG) backup option for Exchange server Mail Level backup.

Exchange Server 2013 / 2016 / 2019 Mail Level backup and restore can be performed by installing AhsayOBM either on the Exchange server 2013 / 2016 / 2019 hosting the database or on a remote backup machine.

1.2 What is this software?

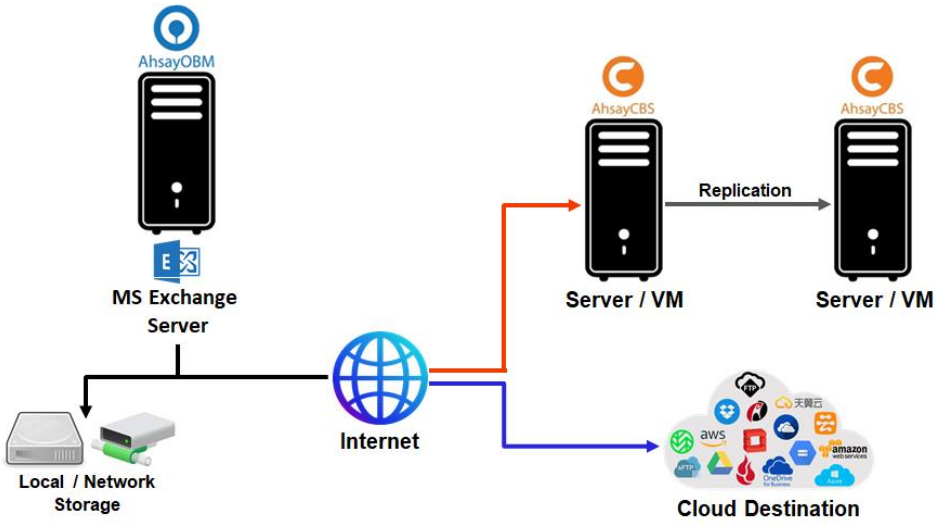
Ahsay brings you specialized client backup software, namely AhsayOBM, to provide a set of tools to protect your mailboxes and public folders on Microsoft Exchange Server 2013 / 2016 / 2019. This includes backup and recovery of individual emails, contacts, calendars and other mail items in your mailboxes and public folders, with snapshots / versioning, and retention policy to protect even email that you may have accidentally deleted from your Exchange 2013 / 2016 / 2019 mailboxes or public folders.

1.3 System Architecture

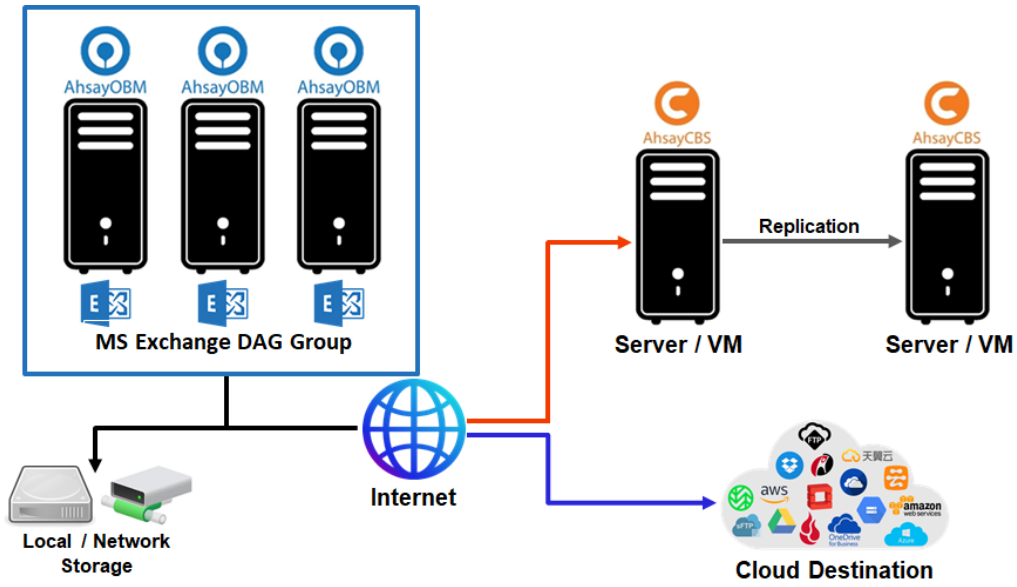
Below is the system architecture diagram illustrating the major elements involved in the backup and restore process among the Microsoft Exchange Server 2013/ 2016 / 2019, AhsayOBM and AhsayCBS.

1. **AhsayOBM v9.0.0.0 or above installed on Exchange Server 2013/ 2016 / 2019.**

   - **Standalone:** The latest version of AhsayOBM is installed on the Exchange server which is connected to AhsayCBS backup server through LAN or internet.

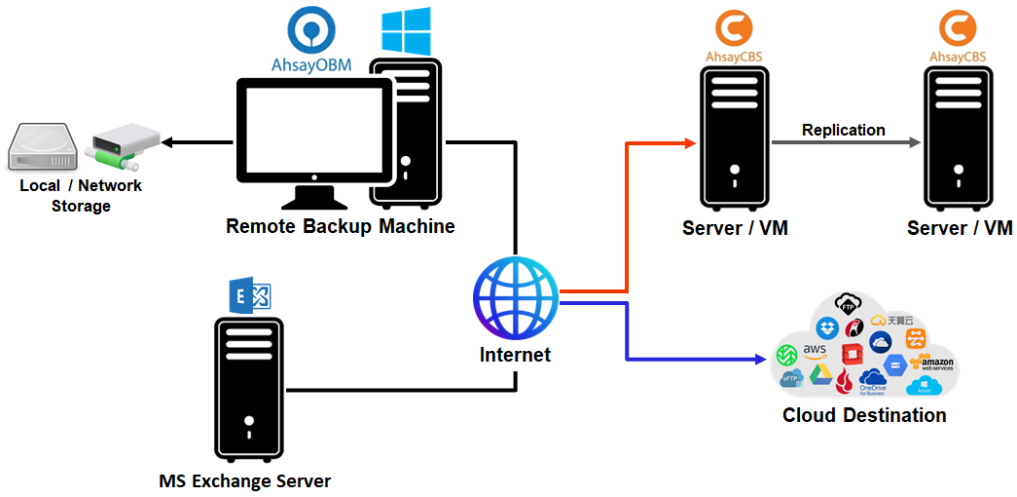


- **Database Availability Group (DAG):** The latest version of AhsayOBM is installed on all the DAG members on Exchange server which is connected to AhsayCBS backup server through LAN or internet, and all the DAG members share the same backup set.

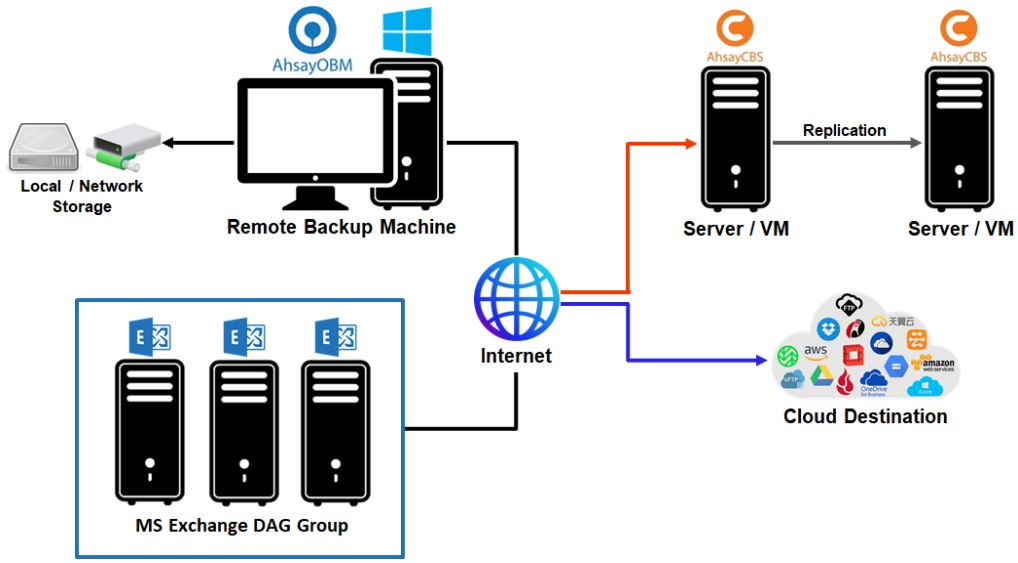


2. **AhsayOBM v9.0.0.0 or above installed on Remote Backup Machine.**

- **Standalone:** The latest version of AhsayOBM is installed on the remote backup machine which is connected to Exchange server and AhsayCBS backup server through LAN or internet.

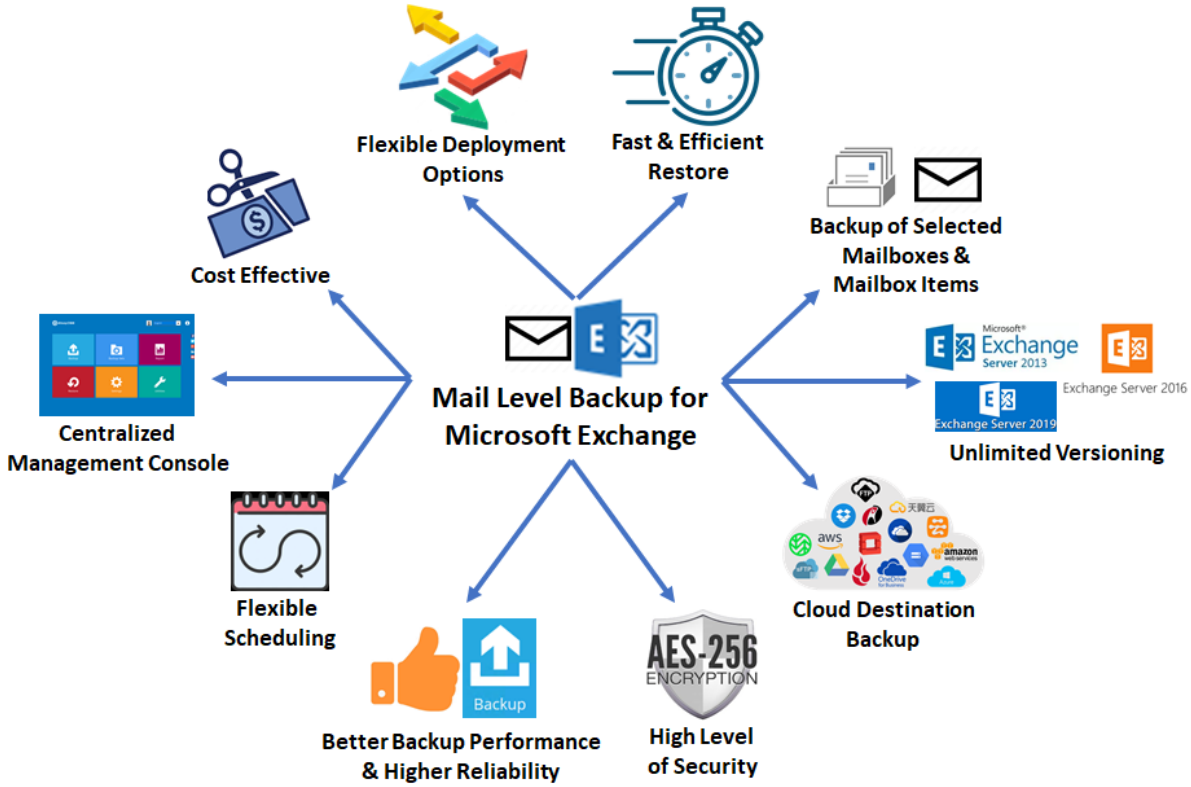


- **Database Availability Group (DAG):** The latest version of AhsayOBM is installed on the remote backup machine which is connected to DAG members on Exchange server and AhsayCBS backup server though LAN or internet, and all the DAG members share the same backup set.



1.4 Why should I use AhsayOBM to back up my Mailboxes and Public Folders?

We are committed to bringing you a comprehensive Exchange 2013 / 2016 / 2019 Mail Level backup solution with AhsayOBM. Below are some key areas that we can help to make your backup experience a better one.



1. **Fast and Efficient Restore**

   We understand that restore could be a time and resources consuming process, which is why AhsayOBM is designed with advanced technologies to make restore a fast and efficient process by restoring individual mail items without the need to restore the whole Exchange server database.

   AhsayOBM supports recovery directly to a live production MS Exchange server, so there is no service interruption or downtime incurred, and also the user mailboxes do not have to be disabled and can function normally during the recovery procedure.

2. **Backup of Selected Mailboxes & Mailbox Items**

   The backup resources can be mailbox level, folder level and even item level.

   - Flexible backup options:
     - Only select the required mailboxes, specific folders or items for backup.
   - Flexible restore options:
     - Restore the whole mailbox contents or just one email.
     - Restore mail items to the original mailbox or an alternate mailbox
     - Restore mail items to an alternate mailbox on another email domain

3. **Unlimited Versioning**

   AhsayOBM provides backup and restore option for different version of exchange server to fulfill your requirement.

4. **Flexible Scheduling**

   You may wish to run backup at a specified time interval of your choice, that's why we also allow you to set your own backup schedules so that you can take full control of the time when to perform backup.

   - **Block Level Incremental Backup** – this technology breaks down the backup files into multiple blocks and only the changed blocks will be backed up each time.

5. **High Level of Security with AES 256-bit Encryption**

   We understand your Exchange mail objects may contain sensitive information that requires to be protected, that is why your backup data will be encrypted with the highest level of security measure.

   - **Un-hackable Encryption Key** – to provide the best protection to your backup data, you can turn on the encryption feature which will default encrypt the backup data locally with AES 256-bit truly randomized encryption key.
   - **Encryption Key Recovery** – Furthermore, we have a backup plan for you to recover your encryption key in case you have lost it. Your backup service provider can make it mandatory for you to upload the encryption key to the centralized management console, the encryption key will be uploaded in hashed format and will only be used when you request for a recovery.

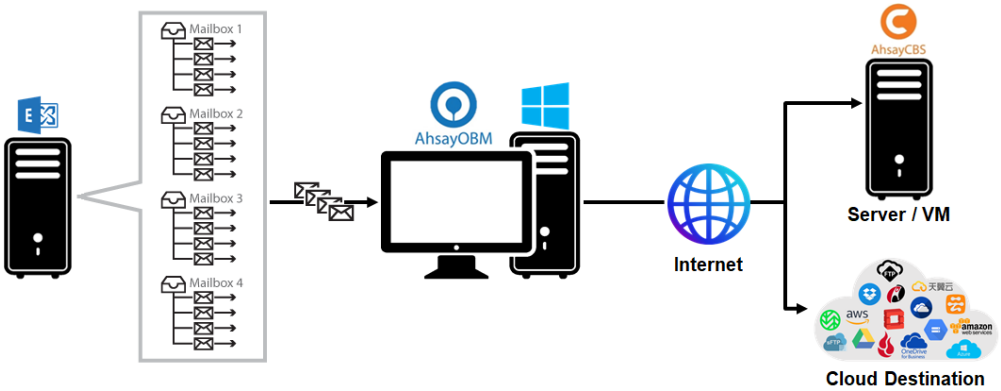
6. Better Backup Performance & Higher Reliability

Better Performance:

- Multi-thread Backup: The technology utilizes the computing power of multiple CPU cores for creating multiple backup and restore threads to produce fast backup and restore performance.

  The default setting for MS Exchange 2013 / 2016 / 2019 mail level backup sets supports:

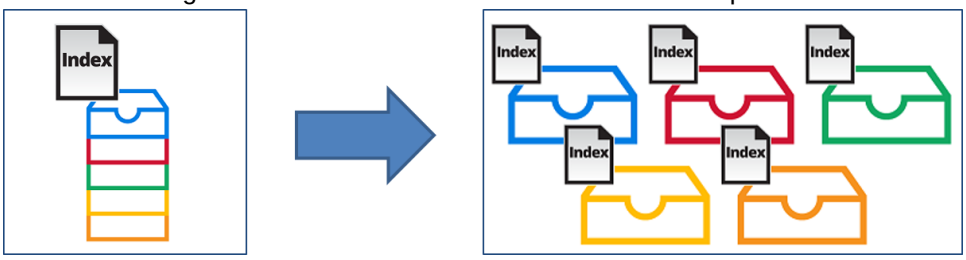
  - Backup of 4 mailboxes concurrently (4 threads).
  - For each of the 4 mailboxes, now supports a maximum 4 mail items concurrently (4 threads).



  As shown the technology translate into a total of 16 concurrent threads compared with a total 4 concurrent backup threads for Exchange 2007/ 2010/ 2013 mail level backup.

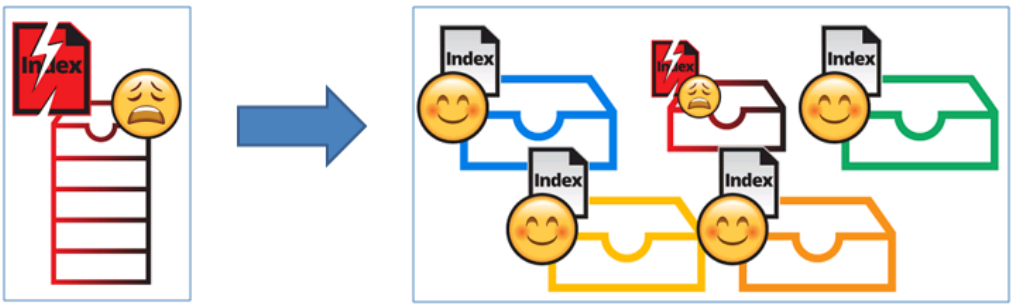
- Index File Structure: The index file structure has been re-designed to improve the backup and restore performance.

  Each Exchange 2013 / 2016 / 2019 mailbox will have its own individual index file instead of a single index file for all mailboxes within the backup set.



  This new design eliminates any potential I/O performance bottlenecks when the index file is updated during each backup job, which can occur when using single index file structure for multi-thread concurrent backup.

Higher Reliability: The implementation of one index file per mailbox can significantly improve the overall resilience of backup and restore from index related issues.



For example, if a single index file is corrupted, it will only affect the corresponding mailbox, while other mailboxes selected for backup are unaffected.

7. Cloud Destination Backup

To offer you with the highest flexibility of backup destination, you can now back up mail objects to a wide range of cloud storage destinations. Utilizing cloud destination backup gives you an extra layer of protection in the event of a local drive corruption, where you will still be able to retrieve data from the cloud destination.

Below is a list of supported cloud destinations.

Aliyun*	**Microsoft Azure**
CTYun*	**Microsoft OneDrive**
Amazon S3	**Microsoft OneDrive for Business**
AWS S3 Compatible Cloud Storage	**Rackspace**
Wasabi	**OpenStack**
Backblaze	**Dropbox**
Google Cloud Storage	**FTP**
Google Drive	**SFTP**

* Available on computers with China or Hong Kong local settings

8. **Centralized Management Console**

Our enriched features on the centralized web console offers you a one-stop location for monitoring and managing your backup and restore. Below is an overview of what you can do with it. For more details regarding the setup and operations of the centralized management console, refer to the AhsayCBS v9 User Guide for details.

- Create / update / delete backup set
- Configure user settings
- Configure backup settings
- View and download backup and restore reports
- Monitor backup and restore live activities
- Monitor storage statistic

9. **Cost Effective**

License is based on per user mailbox, so you only need to pay for the mailboxes that you wish to backup.

10. **Flexible Deployment Options**

AhsayOBM supports Mail Level backup and restore of Exchange Server 2013 / 2016 / 2019 by installing the client agent either on the Exchange server hosting the database, or on a remote backup machine.

Below is a comparison table on the differences on backup and restore with AhsayOBM installation on an Exchange server and on a remote backup machine.

	On Server Backup	Remote Backup
Backup	➢ Backup jobs will utilize the Exchange server's resources, so it may impact the server performance. If the load on Exchange server is already high, this can impact the backup performance. ➢ There is minimal performance issue with the transfer of mail items from the Exchange mail store to AhsayOBM.	➢ Backup jobs will utilize the remote backup machine's resources, therefore, there is minimal impact on the Exchange server performance. ➢ Backup performance can be affected by the network connection speed between the Exchange server and the remote backup machine, especially for connection over the Internet. ➢ General backup performance issues can be easily resolved by installing AhsayOBM on a more powerful backup machine.

Large Number of Mailboxes	➢ Backup of a large number of mailboxes can take more time to complete. For example, it may not be possible to run multiple mail level backup sets concurrently on the Exchange server for 1000 user mailboxes, as it may affect the server performance, so administrator may be limited to start one backup set at a time. 1 backup set can only have a total of 16 concurrent threads by default.	➢ Backup of a large number of mailboxes can take less time to complete. For example, 1000 user mailboxes can be divided into 5 separate backup sets of 200 mailboxes each. The 5 backup sets can be started concurrently on 1 machine or started by multiple machines. 5 backup sets * 16 concurrent threads = 80 concurrent threads
Backup Scheduling	➢ For environment with limited backup window, there may not be sufficient time to complete both database and mail level backup jobs on a daily basis.	➢ For environment with limited backup window, remote backup may be a good option as the mail level backup can be completed remotely, while the database backup can be completed on the Exchange server at the same time period. ➢ Continuous backup can be enabled without significant impact on the Exchange server performance, as backup jobs will utilize the resources of the remote backup machine.
Costs	➢ For Exchange DAG setup, the number of AhsayOBM licenses required is equal to the number of DAG members (nodes). For example, if there are 3 DAG members then 3 AhsayOBM licenses are required. ➢ If the Exchange server is already setup for database backups, then there is no additional license cost. ➢ Do not require provision of additional Windows machine.	➢ Only requires 1 AhsayOBM license as remote backup of Exchange DAG only requires AhsayOBM to be installed on 1 machine. ➢ May require provision of additional Windows machine. It may also be possible to reuse existing AhsayOBM installation on a Windows machine.

Restore	➢ The restore of mailbox items to another (standby) MS Exchange server, requires installation of AhsayOBM on the new MS Exchange server.	➢ Easily restore mailbox items to another (standby) MS Exchange server, without the need to reinstall AhsayOBM. ➢ Restore mailbox items without direct / physical access to the MS Exchange server. ➢ Restore performance can be affected by any network connection issue between the Exchange server and the remote backup machine, especially if the connection is over the Internet.

1.5 About This Document

1.5.1 Document Main Part

The document can be divided into 3 main parts.

Part 1: Preparation for Exchange 2013 / 2016 / 2019 Mail Level Backup & Restore

Requirements
Requirements on AhsayOBM, Exchange Server 2013 / 2016 / 2019 and Windows Operating System

Supported Backup Source & Limitation
Supported backup source of Exchange Server 2013 / 2016 / 2019 and limitation

Best Practice and Recommendation
Items recommended to pay attention to before backup and restore

Part 2: Perform Mail Level Backup and Restore for Microsoft Exchange 2013 / 2016 / 2019 on Exchange Server

Standalone Backup Option
Create Mail Level backup set, run Mail Level backup job and restore Mail Level backup

Database Availability Group (DAG) Backup Option
Create Mail Level backup set, run Mail Level backup job and restore Mail Level backup

Part 3: Perform Mail Level Backup and Restore for Microsoft Exchange 2013 / 2016 / 2019 on Remote Backup Machine

Standalone Backup Option

Create Mail Level backup set, run Mail Level backup job and restore Mail Level backup

Database Availability Group (DAG) Backup Option

Create Mail Level backup set, run Mail Level backup job and restore Mail Level backup

1.5.2 What should I expect from this document?

After reading through this documentation, you can expect to have sufficient knowledge to set up your system to make Mail Level backup of Exchange Server 2013 / 2016 / 2019 on AhsayOBM, as well as to carry out an end-to-end backup and restore process.

1.5.3 Who should read this document?

This documentation is intended for backup administrators and IT professionals who are responsible for the Exchange Server 2013 / 2016 / 2019 Mail Level backup and restore.

2 Preparing for Backup and Restore

2.1 Requirement

You are strongly recommended to configure or check all the settings below to confirm all the requirements are met before you proceed with the Exchange Mail Level backup and restoration.

2.1.1 Software Requirement

Refer to the following article for the list of compatible operating systems and application versions.
FAQ: Ahsay Software Compatibility List (SCL) for version 9.1 or above

2.1.2 Antivirus Exclusion Requirement

To optimize performance of AhsayOBM on Windows, and to avoid conflict with your antivirus software, refer to the following article the list of processes and directory paths that should be added to all antivirus software white-list / exclusion list:

FAQ: Suggestion on antivirus exclusions to improve performance of Ahsay software on Windows

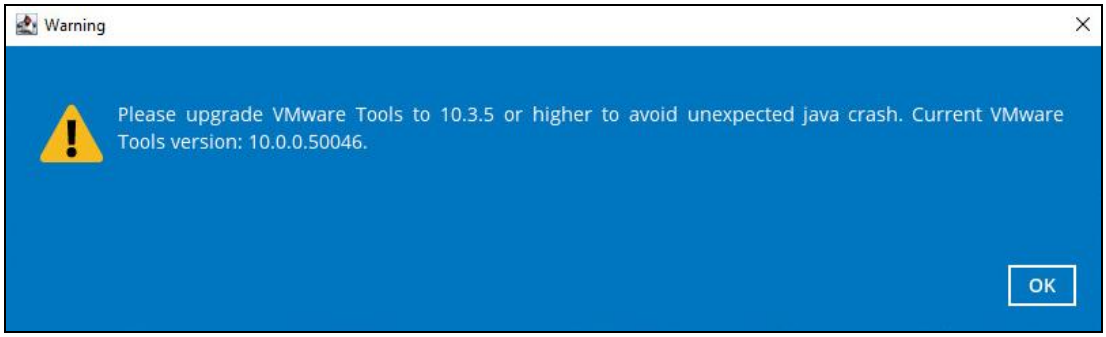
NOTE

The bJW.exe process is automatically added to Windows Defender exclusion list for Windows 10 and 2016 during installation / upgrade via installer or upgrade via AUA.

2.1.3 Upgrade VMware Tools Requirement

To avoid unexpected java crash, if the Windows machine is a guest VM hosted on a VMware Host then it is highly recommended that the VMware tools version installed on the guest VM must be 10.0.5 or above.

Below is the warning message that will be displayed if the version of the VMware Tools is less than 10.0.5.



NOTE

For more information about the upgrade of VMware Tools, refer to this article ISSUE: AhsayOBM / ACB crash when performing backup or restore on a VMware virtual machine with VMware Tools pre-10.3.5 installed.

2.1.4 AhsayOBM Installation

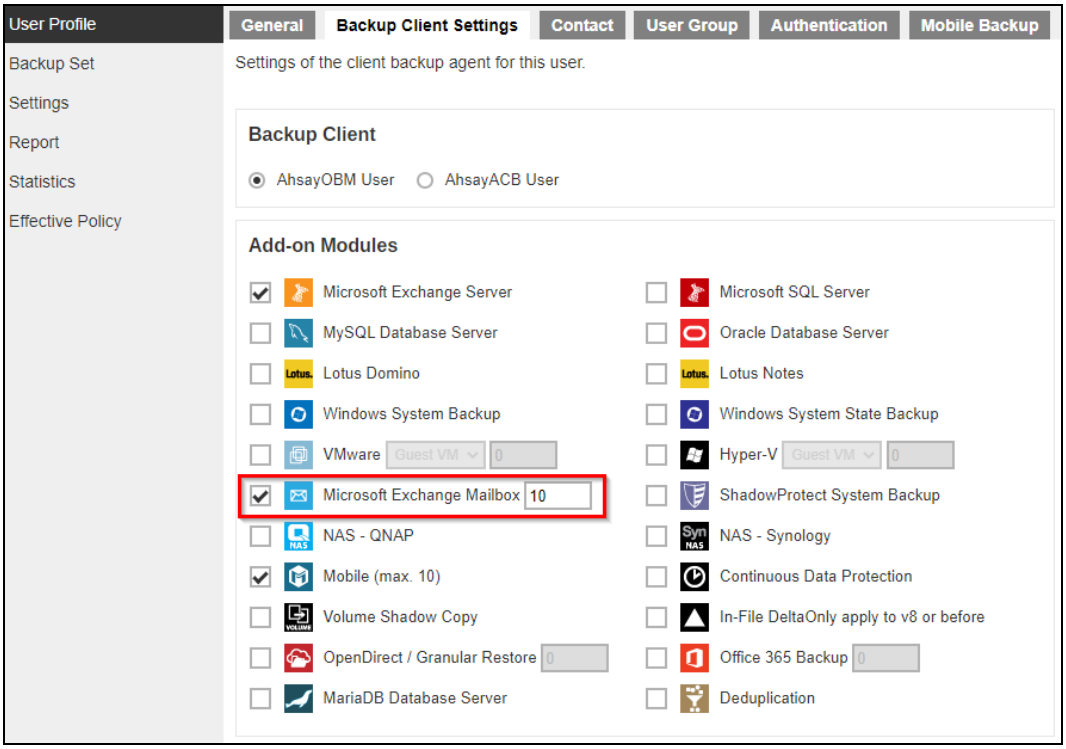
AhsayOBM v9.0.0.0 or above must be installed either on the Exchange Server 2013 / 2016 / 2019 hosting the database or on the remote backup machine.

2.1.5 Microsoft Exchange Mailbox Add-On Module

One Microsoft Exchange Mailbox license is required for the backup of each user mailbox. No license is required for public folder.

Make sure the Microsoft Exchange Mailbox feature has been enabled as an add-on module in your AhsayOBM user account and there is sufficient Microsoft Exchange Mailbox license quota to cover the backup of your mailboxes.

Please contact your backup service provider for more details.



2.1.6 AhsayOBM Licenses

AhsayOBM licenses are calculated on a per device basis.

1. For backup of mailboxes on a standalone Microsoft Exchange 2013 / 2016 / 2019 Server, one AhsayOBM license is required.

2. For backup of mailboxes on a Microsoft Exchange Server 2013 / 2016 / 2019 DAG setup, the number of AhsayOBM licenses required is equal to the number of DAG members in the DAG. For example, if there are three DAG members then three AhsayOBM licenses are required.

   Please contact your backup service provider for more details.

2.1.7 Backup Quota Requirement

Make sure that your AhsayOBM user account has sufficient storage quota assigned to accommodate the storage of additional Exchange mailbox and public folder items for the new mail level backup set and retention policy.

Please contact your backup service provider for more details.

2.1.8 Continuous Backup Module

The Continuous backup add-on module is required if you would like to enable the continuous backup feature.

2.1.9 Java Heap Size

The default Java heap size setting on AhsayOBM is 2048MB. For Exchange 2013 / 2016 / 2019 mail level backup, it is highly recommended to increase the Java heap size setting to be at least 4096MB to improve backup and restore performance. The actual heap size is dependent on amount of free memory available on your Exchange 2016 / 2019 server.

2.1.10 Temporary Directory Folder

Temporary Directory folder is used by AhsayOBM for storing backup set index files and any incremental or differential delta files generated during a backup job. To ensure optimal backup/restoration performance, it is recommended that the temporary directory folder is located on a local drive with sufficient free disk space.

2.1.11 Scheduled Backup for Exchange Server in Data Availability Group (DAG)

Scheduled backup is required if you choose to back up in DAG option on Exchange server as AhsayOBM on all DAG members will base on the scheduled backup time to start backup on all the individual DAG member at the same time.

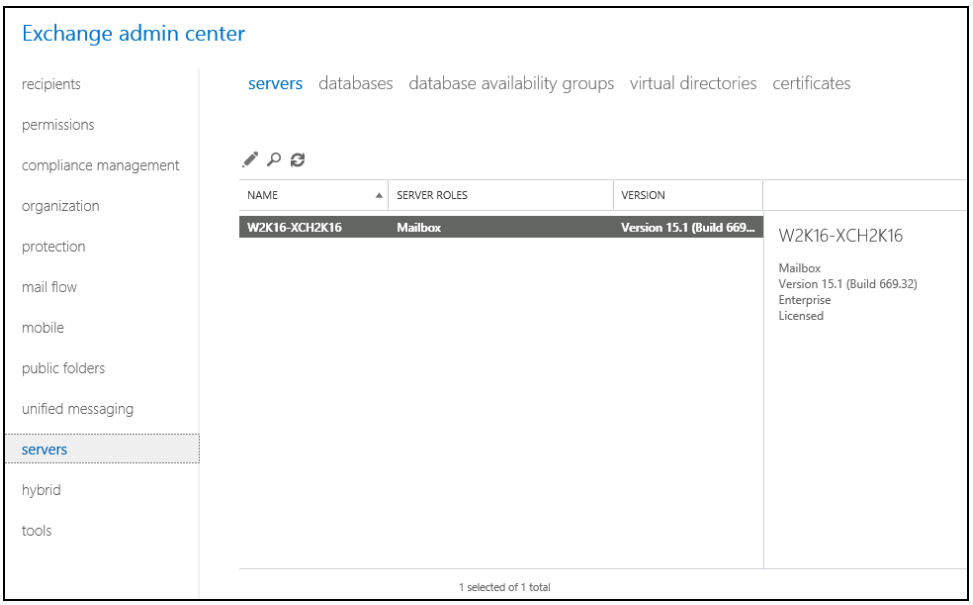
1. A DAG backup cycle is considered complete only when scheduled backup on all DAG members have been carried out. An email report will be generated when a complete DAG backup cycle has taken place.

2. Please keep in mind that manual backup will only be considered as individual Mail Level backup, and therefore will not be counted as part of the DAG backup cycle.

However, for backup and restore on a remote backup machine, as the operation for single node can be done either manually or automatically, a scheduled backup is not required.

2.1.12 Mailbox Role

Ensure all nodes have mailbox role. This can be checked by accessing the Exchange admin center (EAC).



2.1.13 Operating System

1. For AhsayOBM installed on the Exchange Server 2013/2016/2019, the operating system must be Windows Server 2012/ 2012 R2/ 2016 / 2019 or above.

2. For AhsayOBM installed on the remote backup machine, the operating system must be Windows 7/ 8/ 8.1/ 10 or Windows Server 2008/ 2008 R2/ 2012/ 2012 R2/ 2016 / 2019 or above.

2.1.14 Supported Exchange Server 2013 / 2016 / 2019 Version

- MS Exchange Server 2013 Cumulative Update 3 (CU3) or later is supported.
- MS Exchange Server 2016 Cumulative Update 4 (CU4) or later is supported.
- MS Exchange Server 2019 Cumulative Update 1 (CU1) or later is supported

2.1.15 Exchange Servers Properties

To check the properties of Exchange Servers, use the Get-ExchangeServer cmdlet found in the Exchange Management Shell.

Example: Get-ExchangeServer | Format-List Name, Edition,AdminDisplayVersion

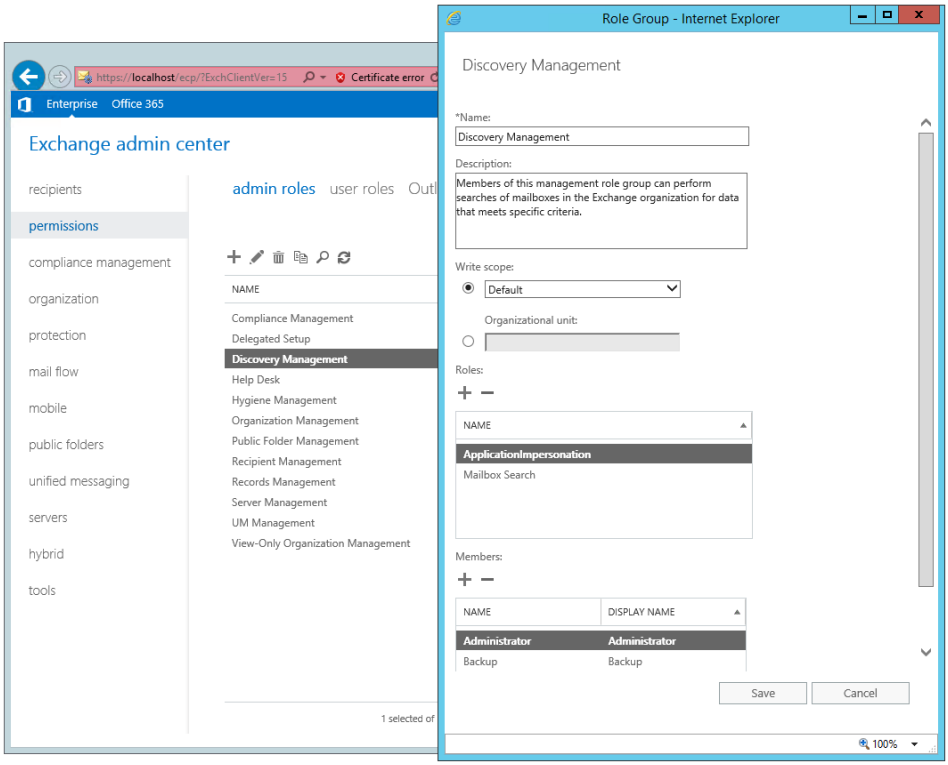
Please refer to the following Microsoft article for details of MS Exchange build numbers and releases: Exchange Server build numbers and release dates

2.1.16 Windows User Account Permission

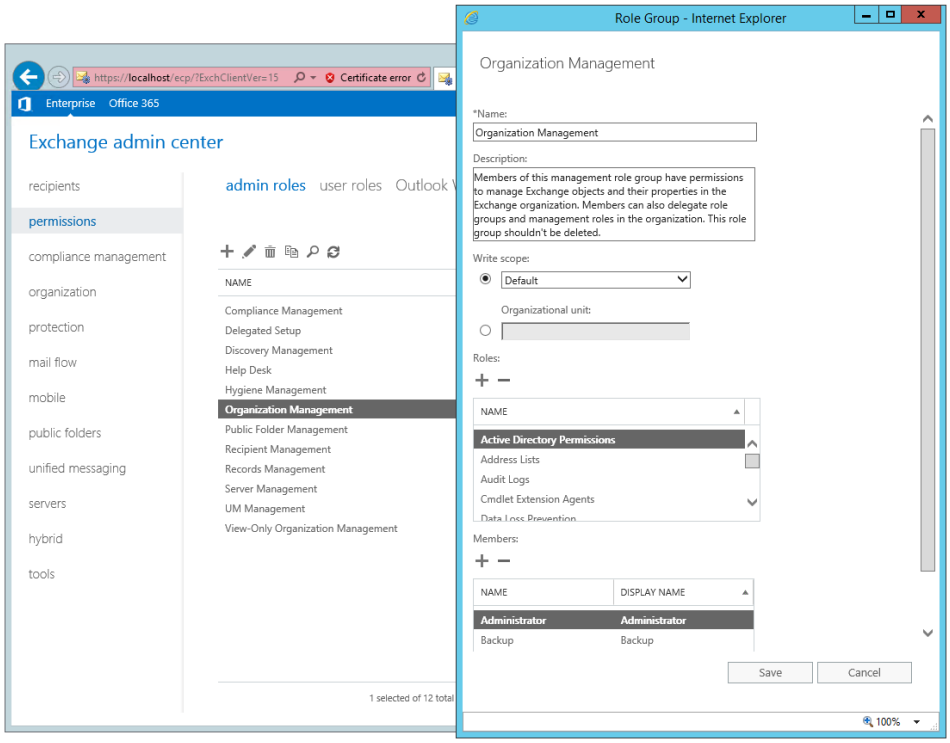
The Windows user account used for the backup must be a member of the following security groups.

Exchange Server 2013/2016/2019

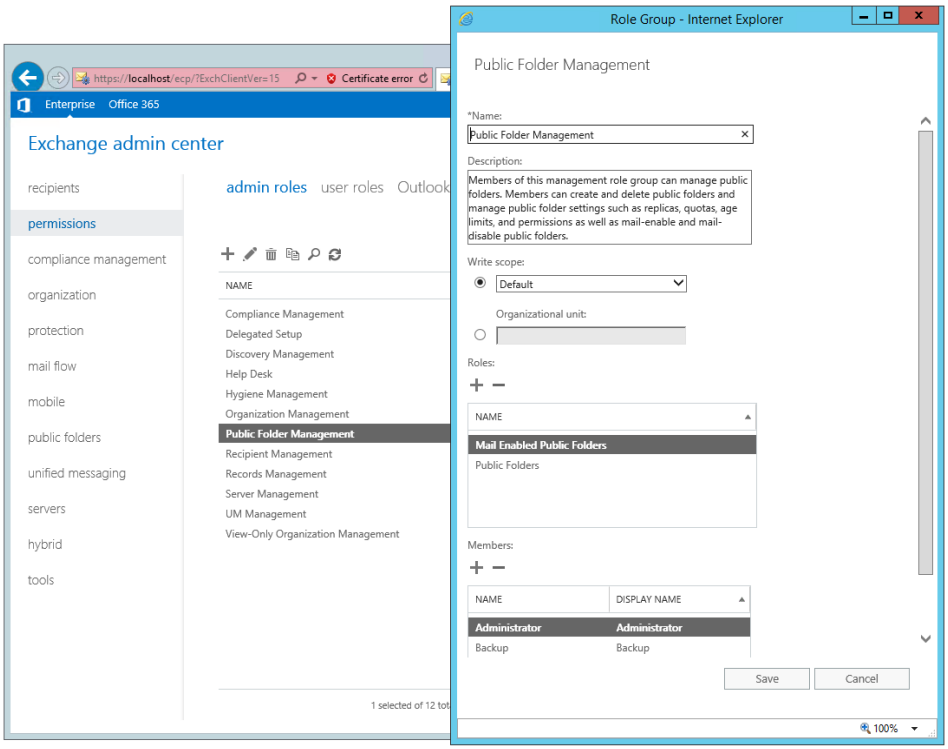
- Discovery Management (including ApplicationImpersonation and Mailbox Search)



- Organization Management



- Public Folder Management

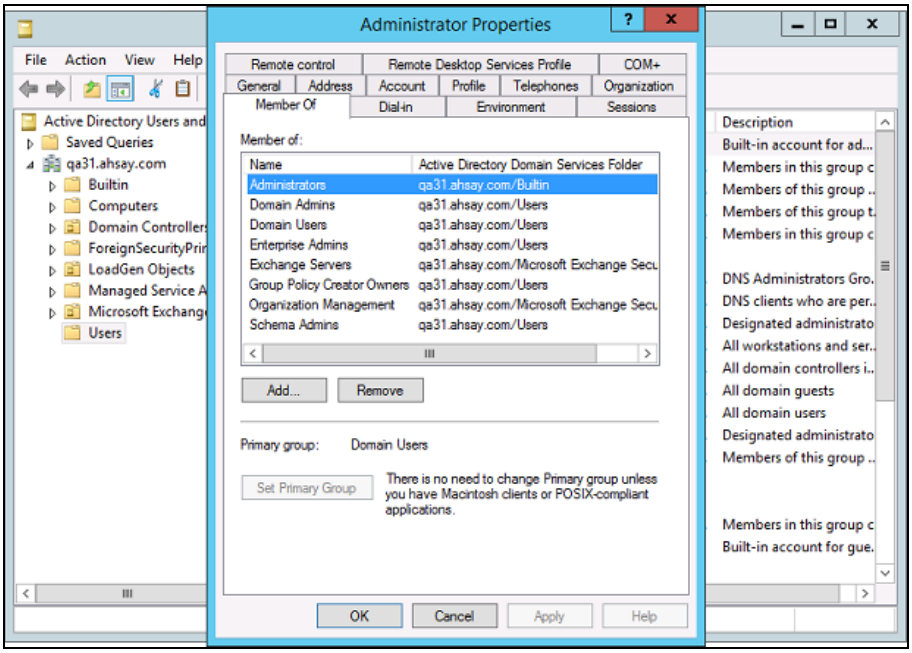


Login to the Exchange admin center, under **permissions**, **admin roles**. Assign the user to be running the backup as member of the following **admin roles**:

- Discovery Management (including the following Roles):
  - ApplicationImpersonation
  - Mailbox Search
- Organization Management
- Public Folder Management

Exchange Server 2013

- Microsoft Exchange Security \ Organization Management
- Users \ Administrator
- Users \ Domain Admins
- Users \ Enterprise Admins



Steps to check the current settings

1. Click Start > **Control Panel** > **Administrative Tools**, and then click **Active Directory Users and Computers**.

2. Browse to the organization unit containing the corresponding operating system account.

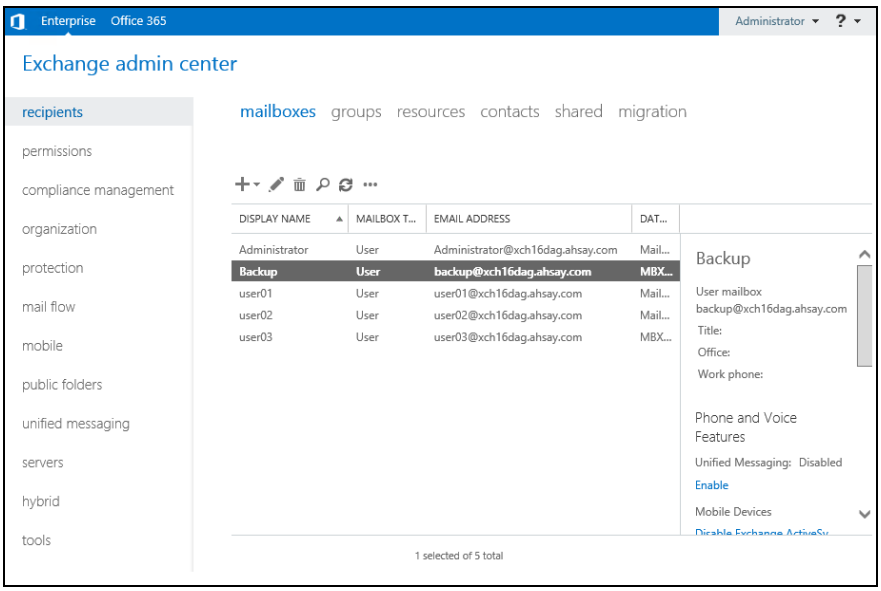
3. Right click on the user and select **Properties**.

   Select the **Member Of** tab to check on the membership setting.

2.1.17 Enabling Mailbox

The Windows user account must have an Exchange Server mailbox. Refer to the URL below for more information.

Exchange Server 2013/2016/2019



Refer to the following article from Microsoft for more details on how to check if an account is mailbox enabled and how to enable it: Create user mailboxes in Exchange Server

Exchange Server 2013

Refer to the following article from Microsoft for more details on how to check if an account is mailbox enabled: Create user mailboxes

Grant Mailbox Access Permission (Full Access)

Enter the following command in the Exchange Management Shell

Get-Mailbox | Add-MailboxPermission –User "%os_username%" –AccessRights FullAccess

Example: granting permission to "administrator" account

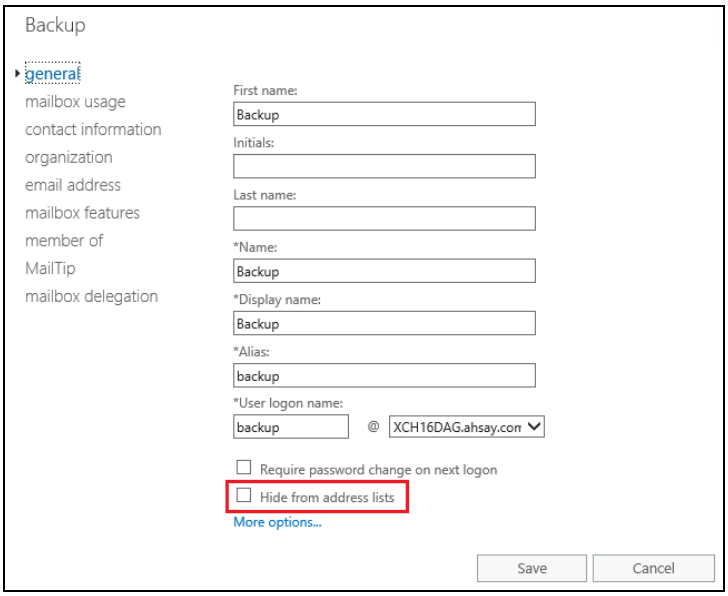
Get-Mailbox | Add-MailboxPermission –User "administrator" –AccessRights FullAccess

2.1.18 Login Name Format Requirement

Make sure the Username for connecting the Exchange Server is entered in the format of "user@hostname" (e.g. admin@ahsay.local). It is the same one you can find under the mailbox setting of the Exchange user account on Exchange Admin Center.

2.1.19 Backup Source Requirement

Ensure that the "**Hide from address lists**" option is unchecked for all mailboxes to be selected for backup. Mailbox hidden from the address list will not be shown in the backup source selection menu.



2.1.20 Network Drive Requirements

The login accounts for network drives must have read and write access permission to ensure that backup and restore would be successful.

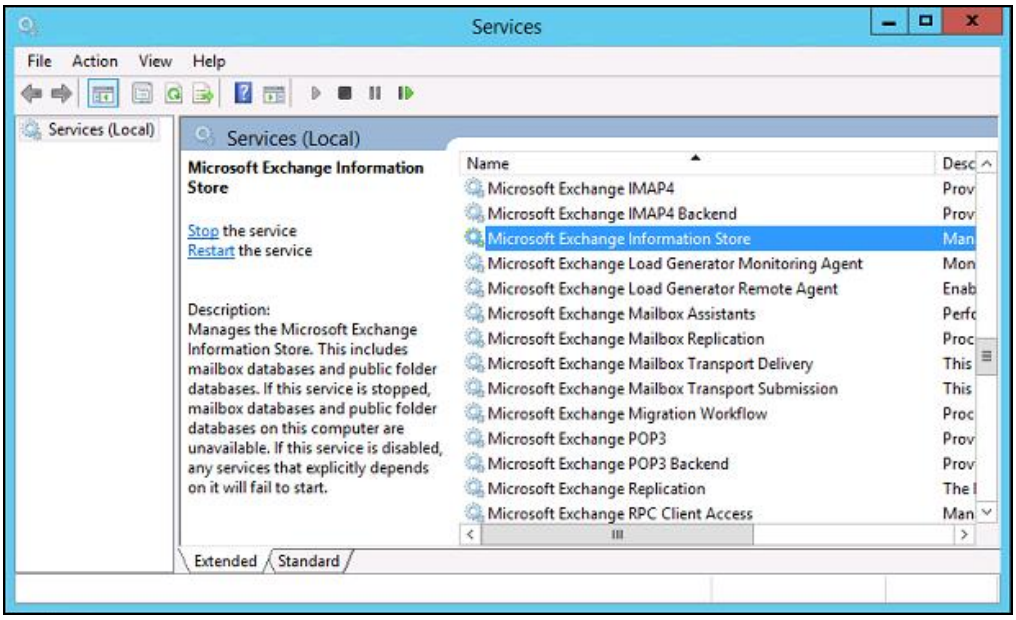
2.1.21 Port Configuration

As Exchange 2013 / 2016 / 2019 mail level backup and restore is implemented using Microsoft EWS API (Exchange Web Services), which enables AhsayOBM to access mailbox items such as email message, meetings, notes, calendar, contact, etc., without any additional installation or complicated setup required on the Exchange 2013 / 2016 / 2019 Server or remote backup machine, only **port 443** must be configured to allow communication between AhsayOBM and Exchange server.

2.1.22 Exchange related Windows Services

Ensure all MS Exchange related services have been started, particularly the **MS Exchange Information Store.**

To verify this setting, launch the **Services** menu by clicking **Start** then typing “Services” in the search box. All Exchange related services should be started by default, in case it is not, turn it on by right clicking the item and then select **Start**.

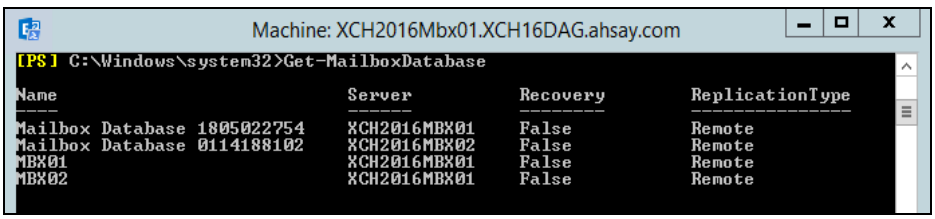


2.1.23 MS Exchange Databases

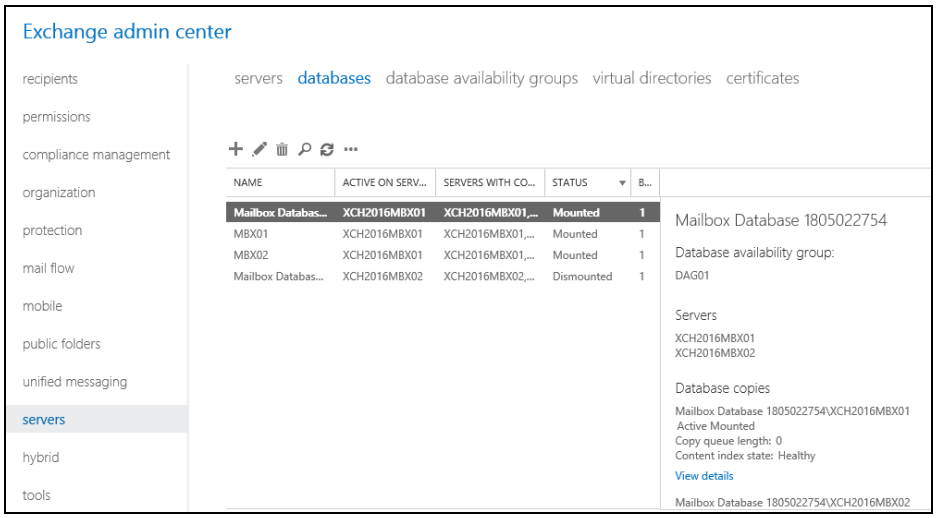
Ensure the MS Exchange Mailbox and Public Folder databases are mounted. This can be verified by Exchange Management Shell or Exchange Admin Center (EAC).

- Type the following command in the Exchange Management Shell.

```
Get-MailboxDatabase
```



- Exchange Admin Center (EAC)



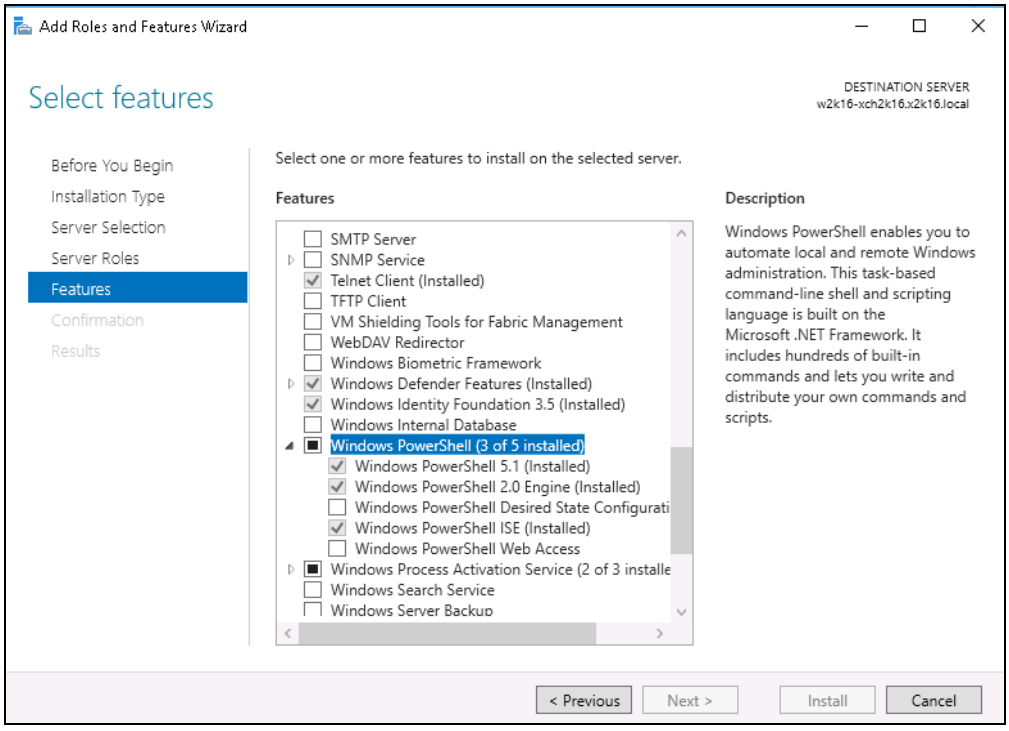
2.1.24 Windows PowerShell

Windows PowerShell 5.1 Engine for Exchange Server 2016/2019

Ensure that Windows PowerShell 5.1 Engine is installed.

To install the feature:

1. Navigate to **Server Manager** > **Manage**, then select **Add Roles and Features**.
2. On the **Select installation type** screen, select **Role-based or feature-based** installation.
3. **Select** the target server.
4. On the Select **features** screen, go to the **Features** option, check the box next to **Windows PowerShell 5.1 Engine**.

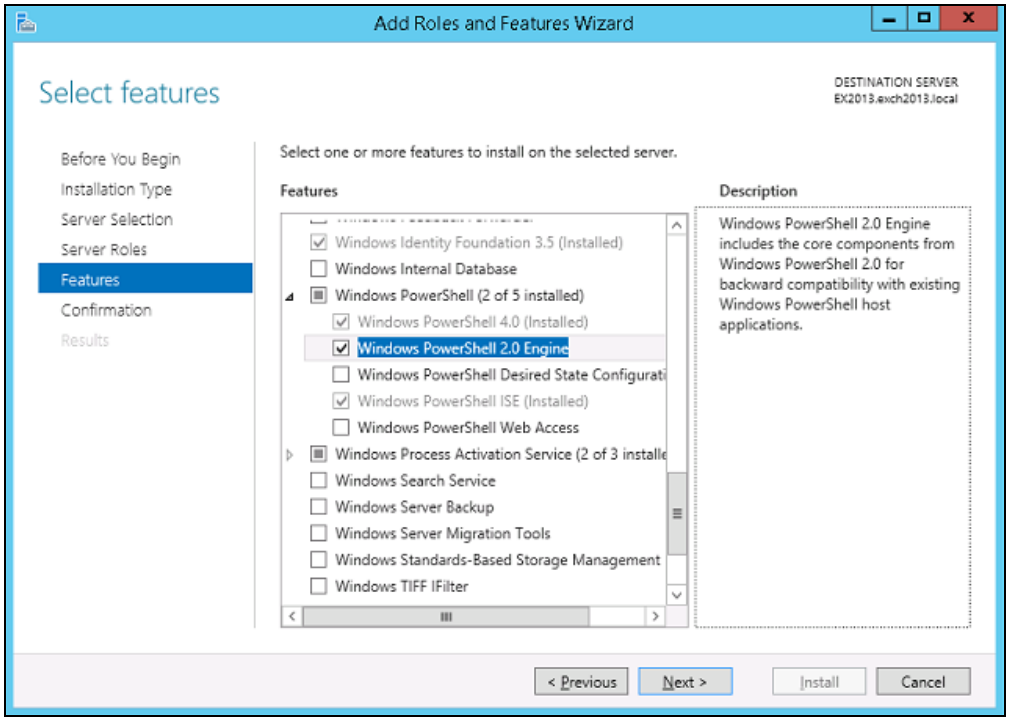


Windows PowerShell 2.0 Engine for Exchange Server 2013

Make sure the Windows PowerShell 2.0 Engine is installed.

To install the feature:

1. Navigate to **Server Manager** > **Manage**, then select **Add Roles and Features**.
2. On the **Select installation type** screen, select **Role-based or feature-based** installation.
3. Select the target server.
4. On the **Select features** screen, go to the **Features** option, check the box next to **Windows PowerShell 2.0 Engine**.

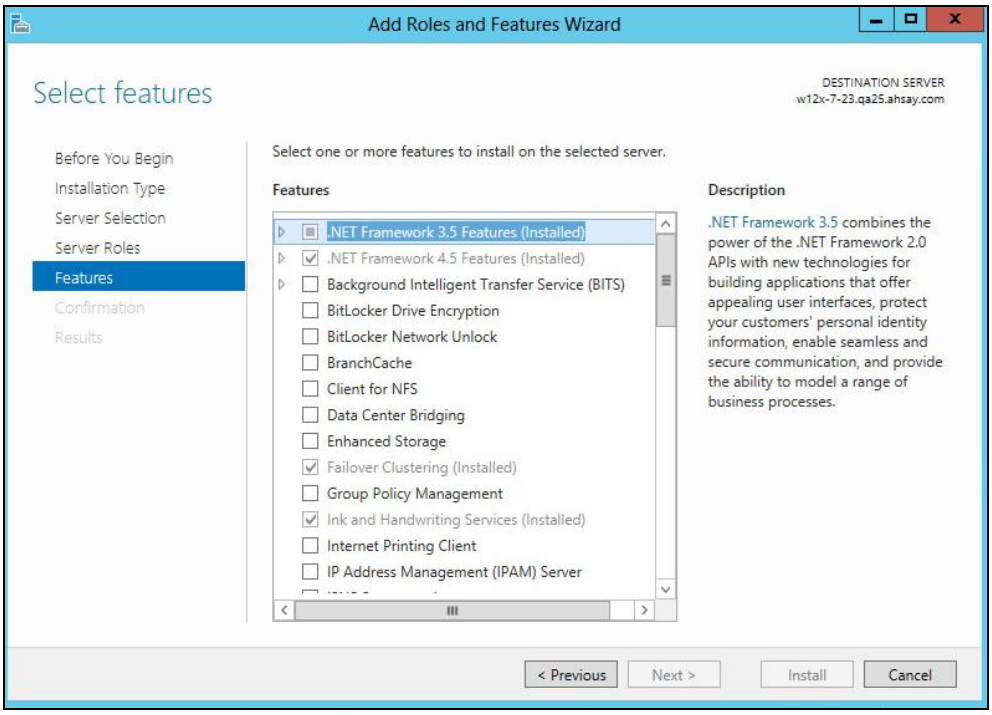


2.1.25 .Net Framework

.Net Framework 4.6.2 Features for Exchange Server 2016/2019

Ensure **.Net Framework 4.6.2 Features** is installed. Please refer to the following URL for detailed information: [Exchange Server system requirements]

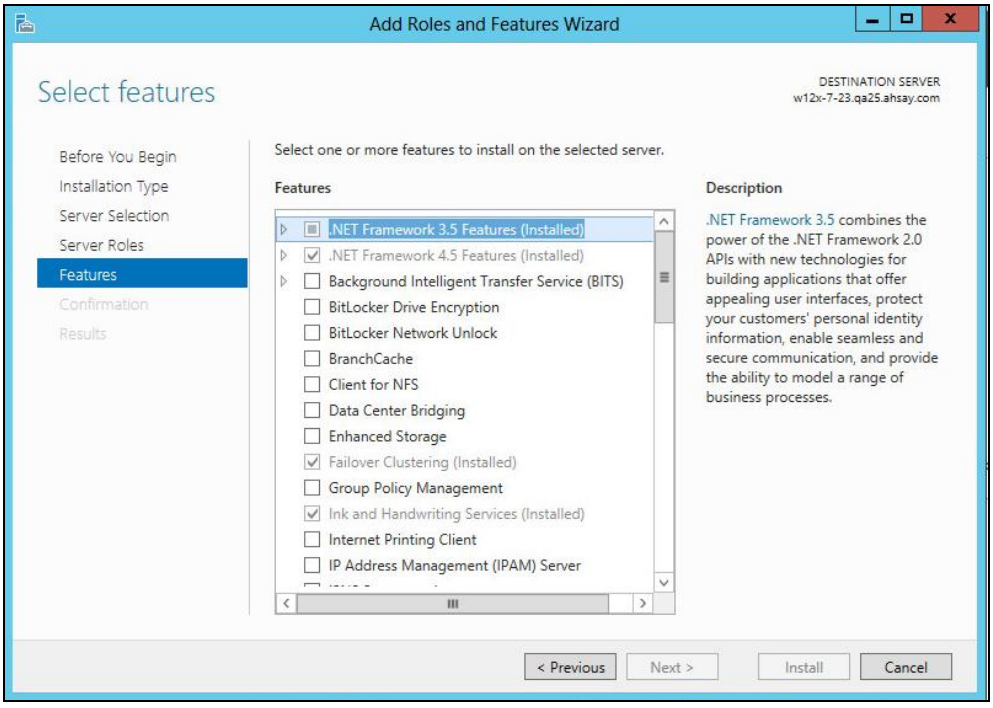
This feature can be enabled by accessing **Server Manager > Dashboard > Manage > Add Roles and Features Wizard > Feature Page**.



.Net Framework 4.6.2 Features for Exchange Server 2013

If you are using Exchange server 2013 on Windows server 2012, please install **.Net Framework 3.5 Features**.

This feature can be enabled by accessing **Server Manager** > **Dashboard** > **Add Roles and Features Wizard** > **Feature Page**.



2.1.26 Remote Exchange Management Shell

For setup on MS Exchange Server 2013, the Remote Exchange Management Shell must be enabled for the operating system account used for the backup.

Enter the following command in Exchange Management Shell to enable this feature.

```
>Set-User "%os_username%" -RemotePowerShellEnabled $True
```

Reboot the Exchange Server after executing the command.

NOTE

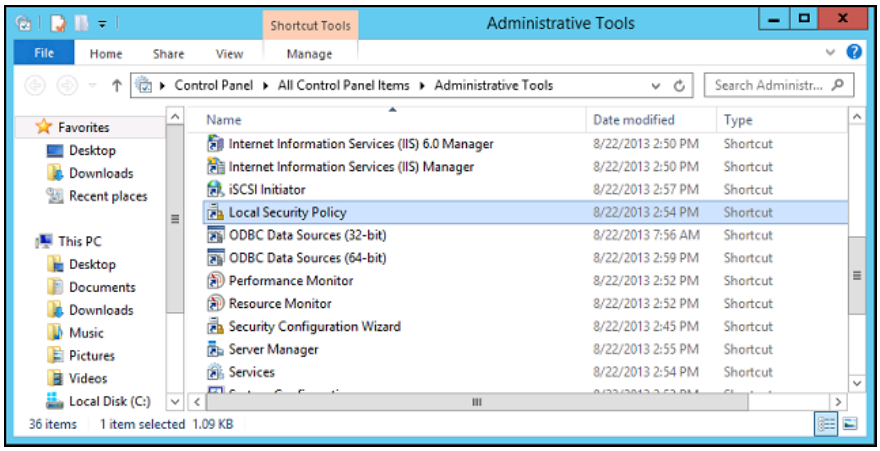
Remote Shell in Microsoft Exchange Server enables you to manage your server running Exchange.

2.1.27 LAN Manager Authentication Level

Exchange Server 2013

The LAN Manager Authentication level configured on the Exchange Server must be level 3 or above. Follow the steps below to check the settings.

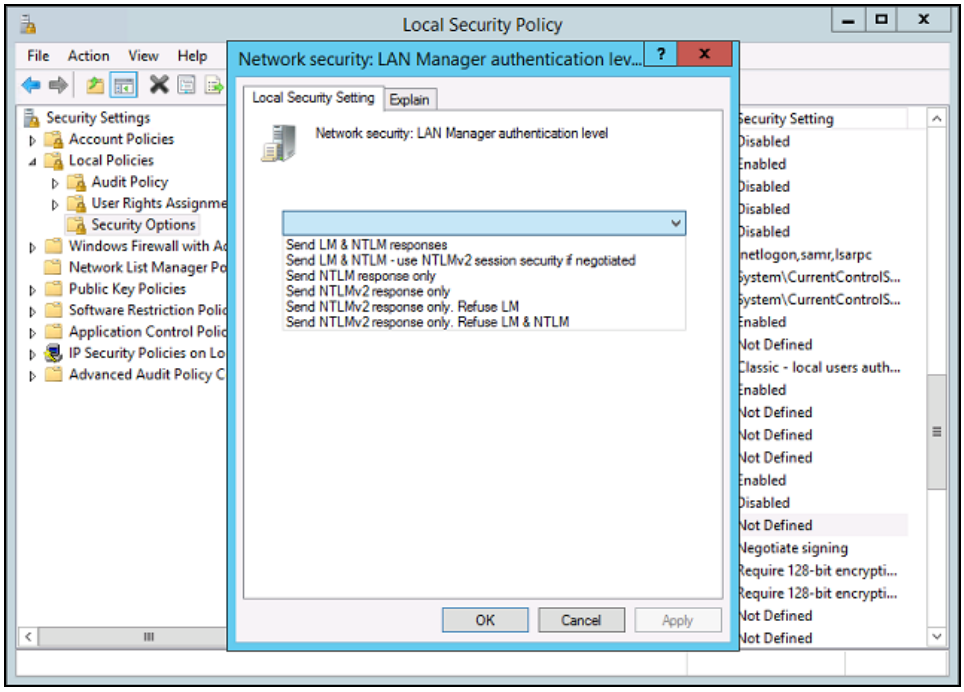
1. Click **Start** > **Control Panel** > **Administrative Tools**, and then click **Local Security Policy.**



2. Under **Security Settings**, expand **Local Policies** > **Security Options**, then click **Network security: LAN Manager authentication level**.

3. Make sure that the setting is configured to use NTLMv2, for example:

   - Send NTLMv2 response only
   - Send NTLMv2 response only. Refuse LM
   - Send NTLMv2 response only. Refuse LM & NTLM



2.1.28 IISAuthenticationMethods Setting

Verify if the IISAuthenticationMethods is set to **Basic** only. If so, change the setting with the commands below.

Exchange Server 2013

1. Click **Start** > **Microsoft Exchange Server** > **Exchange Management Shell**.
2. Enter the following command to check on the IISAuthenticationMethods setting:

```
>Get-OutlookAnywhere
```

3. If it is set to {Basic} only, enter the following command to modify the setting:

```
>Set-OutlookAnywhere -Identity:"%Server%\Rpc (Default Web
Site)" -IISAuthenticationMethods Basic,NTLM,Negotiate
```

4. Reboot the Exchange server.

2.2 Supported Source

Below is the supported mailbox type of Exchange Server 2013 / 2016 / 2019 Mail Level backup.

Mailbox Level			
Item	**Supported?**	**Item**	**Supported?**
User mailbox	✓	Room Mailbox	✓
Public Folder	✓	Equipment Mailbox	✓
Public Folder Mailbox	✓	Shared Mailbox	✓

Below are the items that you can back up or restore from an Exchange Server 2013 / 2016 / 2019 Mail Level backup set.

Folder Level			
Item	**Supported?**	**Item**	**Supported?**
Inbox	✓	RSS Feeds	✓
Drafts	✓	Junk Email	✓
Sent Items	✓	Tasks	✓
Deleted Items	✓	Calendar	✓
Archive	✓	Contacts	✓
Notes	✓		

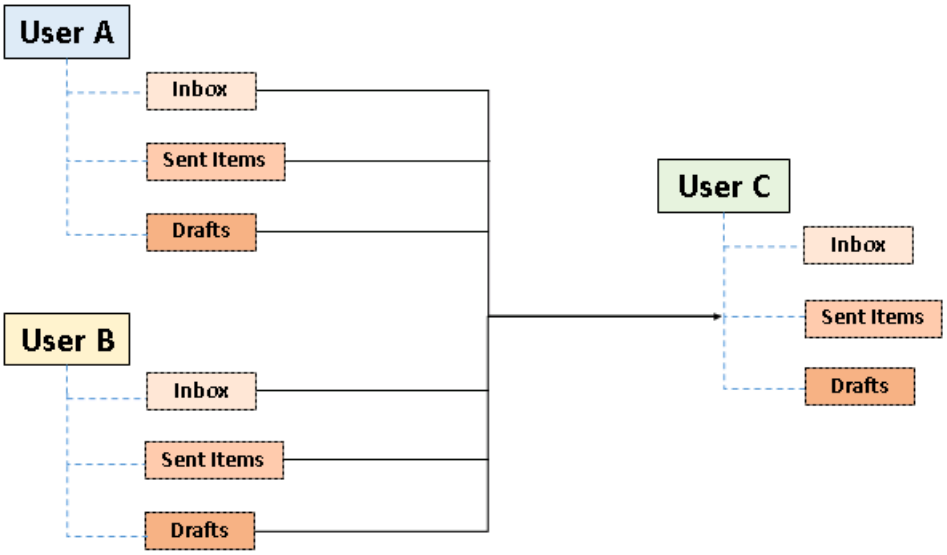
2.3 Limitation

For backup and restoration of Exchange 2013 / 2016 / 2019 Mail Level backup set, here are some limitations:

1. If you are trying to restore item(s) from one mailbox to an alternate location mailbox, AhsayOBM will restore the item(s) to their respective destination folder(s) with the same name of the original folder(s).

   Example: Item from “Inbox” folder of Mailbox-A will be restored to the “Inbox” folder of the alternate location Mailbox-B; Item from “Drafts” folder of Mailbox-A will be restored to the “Drafts” folder of the alternate location Mailbox-B.

2. If you are trying to restore item(s) from several mailboxes to an alternate location mailbox, AhsayOBM will restore the item(s) to their respective destination folder(s) in alternate location mailbox with the same name of the original folder(s).



Example: Item from “Inbox” folder of Mailbox-A and Mailbox-B will be restored to the “Inbox” folder of the alternate location Mailbox-C.

3. Restore of mailbox items or public folder items is only supported if the according mailbox or public folder exists.

4. The restore process cannot create a mail item under the user’s Exchange root folder, it can only restore to the supported folders listed in Chapter 2.2.

5. Only Alternate Location is supported for restoring mailbox items to another domain.

6. Restore of mailbox item(s) in public folder to an alternate location mailbox is not supported.

   Example: Restore of mailbox item(s) in public folder from Mailbox-A to alternate location Mailbox-B is not supported.

7. If you are trying to restore the mailbox item to a destination mailbox which has a different language setting than the original mailbox, AhsayOBM will restore mailbox item(s) to their respective destination folder based on the translation listed below.

   For folders such as ‘Calendar’ or ‘Notes’, a new folder ‘Calendar’ or ‘Notes’ will be created.

Backup source (English)	Action	Destination mailbox with Chinese as default language settings
Inbox	Merge	收件箱
Outbox	Merge	寄件匣
Sent Items	Merge	寄件備份
Deleted Items	Merge	刪除的郵件
Drafts	Merge	草稿
Junk E-Mail	Merge	垃圾電郵
Calendar	Create new folder	Calendar
Notes	Create new folder	Notes

2.4 Best Practices and Recommendations

The following are some best practices or recommendations we strongly recommend you follow before you start any Exchange Server 2013 / 2016 / 2019 Mail Level backup and restore.

- Mail Level Backup must be utilized in conjunction with Database Level Backup to fully protect an Exchange Server.
- Active Directory server should be protected by regular full Window System Backup at least once every two weeks.
- For AhsayOBM installed on Exchange Server, enable scheduled backup jobs when system activity is low to achieve the best possible performance.
- The remote backup machine should be on the same LAN as the MS Exchange server for optimal backup and restore performance.
- It is highly recommended to set the temporary directory folder to another location with sufficient free disk space other than Drive C: (e.g. Drive E:).
- To provide maximum data protection and flexible restore options, it is recommended to configure:
  - At least one offsite or cloud destination
  - At least one local destination for fast recovery
- Perform test restores periodically to ensure your backup is set up and performed properly. Performing recovery test can also help identify potential issues or gaps in your recovery plan. 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.
- **Distributed Backup Solution:** For backup of multiple or mass backup sets, to achieve better backup performance and to minimize any unnecessary loading on the Exchange server, please consider deploying AhsayOBM on remote backup machines as distributed backup solution instead of on the MS Exchange server.
- **Handling Large Number of Mailboxes:** There are two options in backing up large number of mailboxes:
  - Dividing the mailboxes into multiple smaller backup sets
  - Increasing the number of backup threads available

  Dividing the mailboxes into multiple smaller backup sets

  By default, the MS Exchange 2013 / 2016 / 2019 mail level backup module can back up a maximum of 4 mailboxes concurrently (4 concurrent backup threads), while backing up a maximum of 4 mail items concurrently per mailbox (4 concurrent backup threads). Therefore, each backup set supports a maximum of 4x4=16 backup threads at a time. By splitting up all mailboxes into separate backup sets, the more backup sets, the faster the backup process can achieve.

  Example-1: There are 100 mailboxes that need to be backup, you can divide 20 mailboxes into one backup set.

Backup Set Name	Mailbox Number
Backup-Set-1	No.1 -- 20
Backup-Set-2	No.21 -- 40
Backup-Set-3	No.41 -- 60
Backup-Set-4	No.61 -- 80
Backup-Set-5	No.81 -- 100
Note: If there are new mailboxes added, you can create new backup set for the new mailboxes.	

Example-2: There are 100 mailboxes that needs to be backup, you can divide mailboxes into backup sets in alphabetical order.

Backup Set Name	Mailbox Name Start with
Backup-Set-1	A -- E
Backup-Set-2	F -- J
Backup-Set-3	K --O
Backup-Set-4	P -- T
Backup-Set-5	U -- Z
Note: If there are new mailboxes added, you can add the new mailboxes into the original backup set by the corresponding alphabetical order.	

Increasing the number of backup threads available

Apart from splitting up one large Exchange Mail Level backup set into multiple smaller backup sets, another approach is to increase the number of threads available for the backup job.

The number of backup threads is 4 by default. The number of backup threads can be increased (or reduced) by adding the following setting in the AhsayOBM **afc.opt** file located in C:\Program Files\AhsayOBM\afc.opt:

In this example, the number of threads will be increased from 4 to 8.

core.action.BackupExchangeMailCmd.maxConcurrentSubCmd=8

To configure the number of threads, follow the instructions below:

1. Make sure there are no active backup/restore job running.

2. Close the AhsayOBM GUI application.
3. Stop the Ahsay Online Backup Manager services.
4. Go to C:\Program Files\AhsayOBM folder and look for the **afc.opt** file.
5. Open the **afc.opt** file using a text editor such as Notepad or Notepad++.
6. Add the following setting and save the **afc.opt** file.
   core.action.BackupExchangeMailCmd.maxConcurrentSubCmd=8
7. Start the Ahsay Online Backup Manager services.

If you choose to use this option, it is strongly recommended that it will used with AhsayOBM deployed on a remote backup machine running on the same LAN as the MS Exchange 2013/2016/2019 server to minimize the load on the Exchange server.

NOTE

The maximum number of threads you can set is entirely dependent on the free resource available (CPU and memory) on each individual MS Exchange server or remote backup machine. In some cases, using more threads may have the opposite effect as it may end up overloading the MS Exchange server or the staging machine.

There are Pros and Cons in choosing an option for handling large number of mailboxes.

Options in Handling Large Number of Mailboxes	Pros	Cons
Dividing the mailboxes into multiple smaller backup sets	Splitting up all mailboxes into separate backup sets will result to faster backup process.	➢ Creation of multiple backup sets is required, and the individual mailboxes have to be manually selected which can be time consuming. ➢ Requires user maintenance of the multiple back sets as the deleted mailboxes need to be unselected and new mailboxes need to be added which can also take time to complete.
Increasing the number of backup threads available	➢ Does not require splitting up large number of mailboxes into multiple back up sets. ➢ Maximum number of concurrent backup threads can be configured easily.	The number of threads that can be set will rely on the available resource (CPU and memory) on each individual MS Exchange server or remote backup machine. Thus, using more threads may overload the MS Exchange server or the remote backup machine.

- **Periodic Backup Schedule:** The periodic backup schedule should be reviewed regularly to ensure that the interval is sufficient to handle the data volume on the machine. Over time, data usage pattern may change on a production server, i.e. the number of new files created, the number of files which are updated/deleted, and new users may be added etc.

  Consider the following key points to efficiently handle backup sets with periodic backup schedule.

  - Hardware – to achieve optimal performance, compatible hardware requirements is a must. Ensure you have the backup machine's appropriate hardware specifications to accommodate frequency of backups,
    - so that the data is always backed up within the periodic backup interval
    - so that the backup frequency does not affect the performance of the production server
  - Network – make sure to have enough network bandwidth to accommodate the volume of data within the backup interval.
  - Retention Policy – also make sure to consider the retention policy settings and retention area storage management which can grow because of the changes in the backup data for each backup job.

3 On Exchange Server

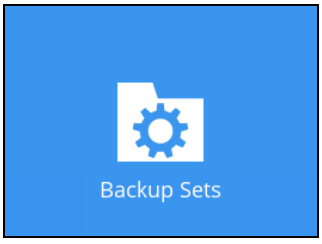
3.1 Standalone Backup Option

3.1.1 Create Mail Level Backup Set

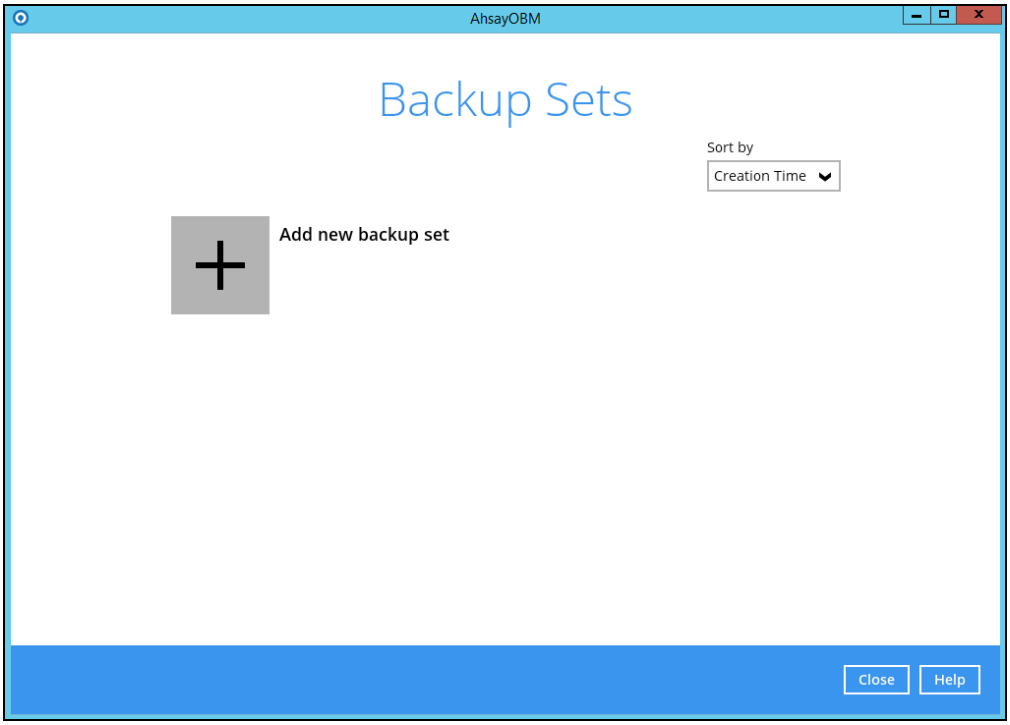
1. A shortcut icon for AhsayOBM should have been created on your Windows desktop after installation. Double click the icon to launch the application and log in.

   For instructions on how to do this please refer to Chapter 8 of the AhsayOBM v9 Quick Start Guide for Windows.

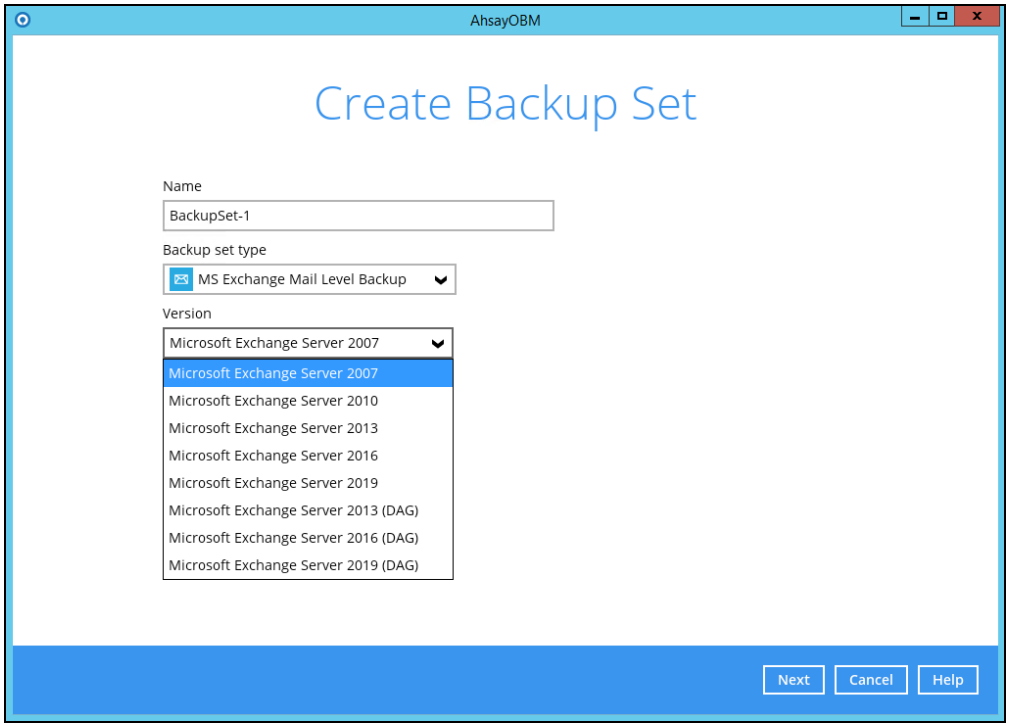
2. Click the **Backup Sets** icon on the main interface of AhsayOBM.



3. Create a new backup set by clicking the "**+**" icon next to **Add new backup set**.



4. Select the Backup set type as **MS Exchange Mail Level Backup.** The system will automatically detect and select the Exchange Server version, make sure the version selected is correct.

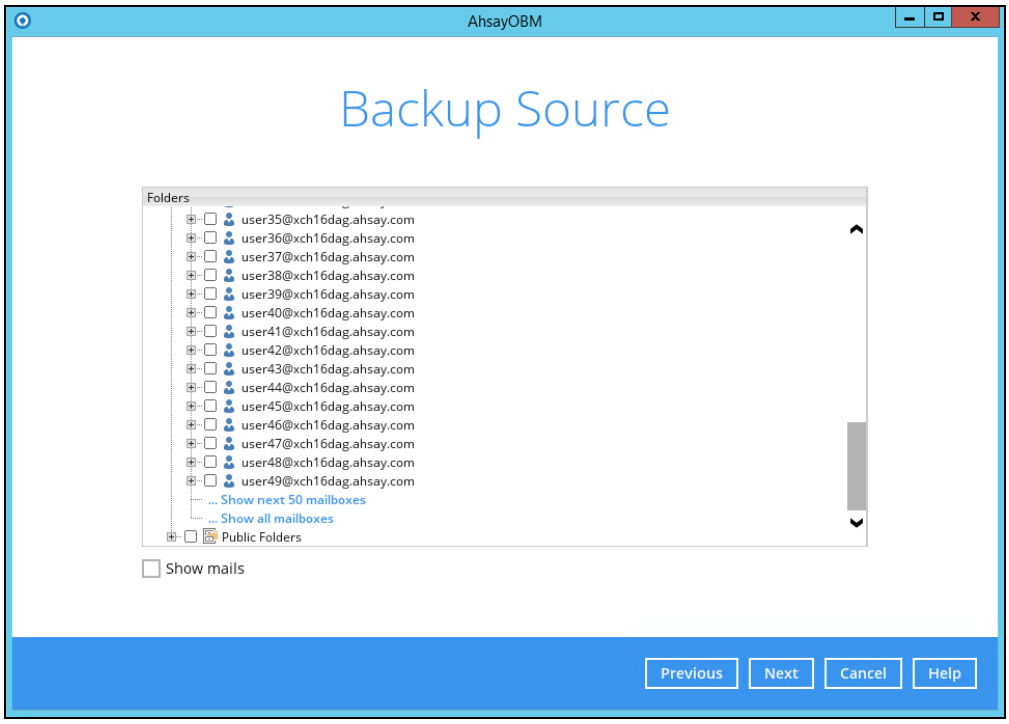


- Name your new backup set.
- Select from the following version:
  - Microsoft Exchange Server 2013
  - Microsoft Exchange Server 2016
  - Microsoft Exchange Server 2019
  - Microsoft Exchange Server 2013 (DAG)
  - Microsoft Exchange Server 2016 (DAG)
  - Microsoft Exchange Server 2019 (DAG)

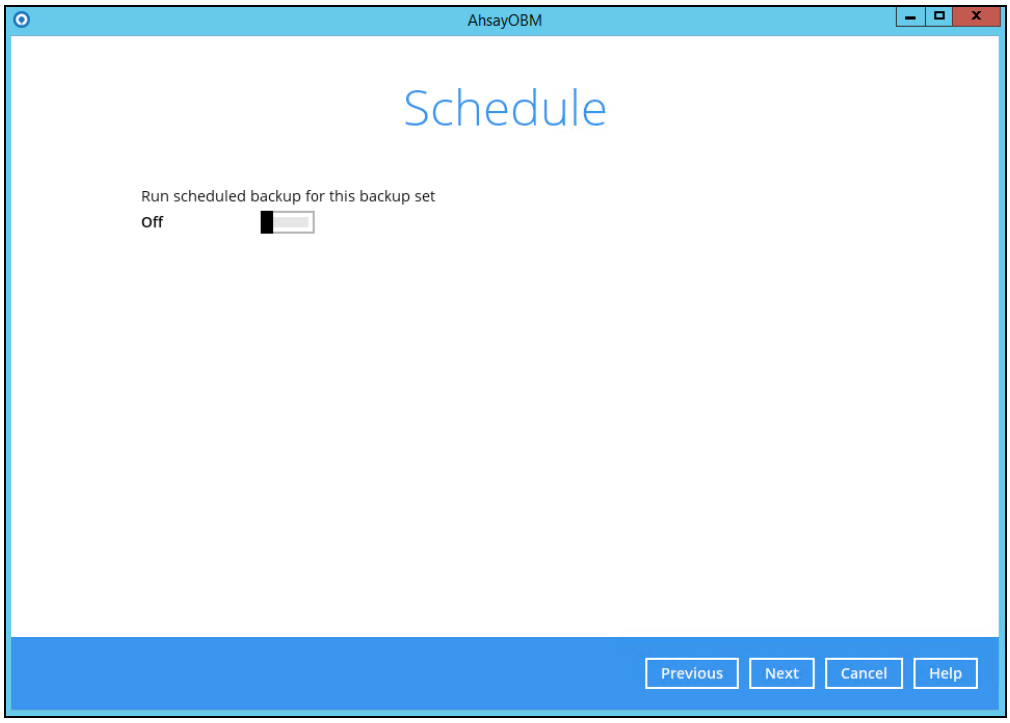
  As AhsayOBM is installed directly on the MS Exchange server. The correct MS Exchange version will be automatically selected.
- Enter the hostname of Exchange server.
- Enter the username and password of the Windows user account used for backup.
- Check the “Access the Internet through proxy” if required.
- Click the **Test** button to verify the login details.

Then click **Next** to proceed.

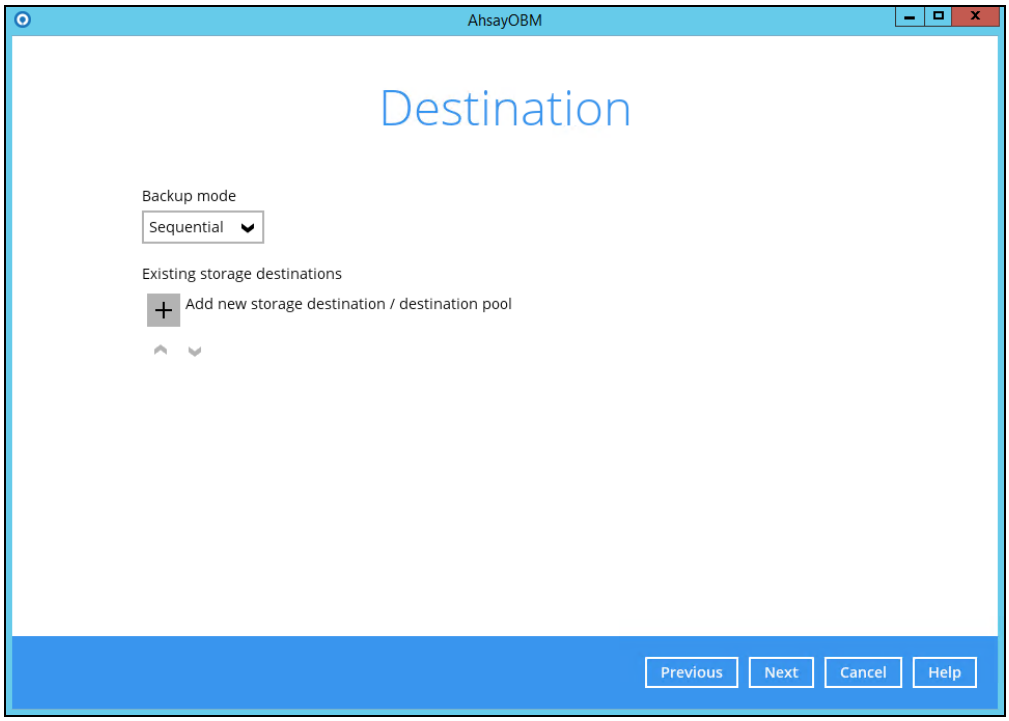
5. In the **Backup Source** menu, select the mailboxes or public folders for backup. Fifty (50) users will be displayed by default. If the MS Exchange Server account consists of more than fifty (50) users or above, click the **show next 50** button to display the next users. You can expand the mailbox or public folder to select which mail folder to back up by clicking the [+] button. You can also click **Show mails** to select an individual mail to back up. Once done, click **Next** to proceed.



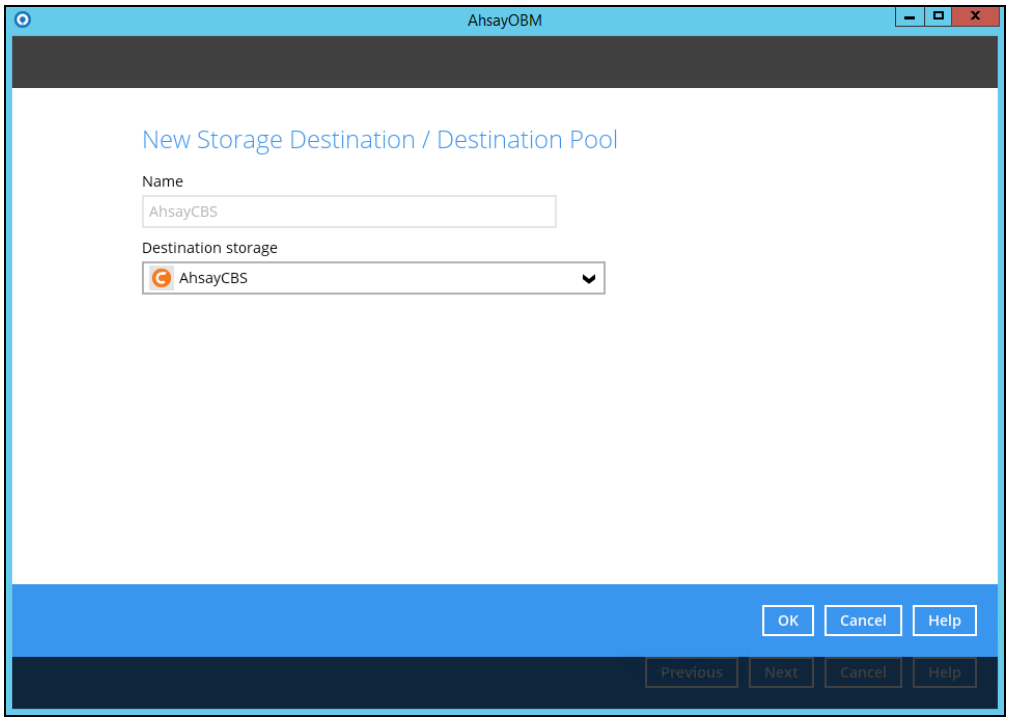
6. In the Schedule menu, you can configure a backup schedule for backup job to run automatically at your specified time interval. By default, the **Run scheduled backup for this backup set** option is disabled. Enable it, then click the "**+**" icon next to **Add new schedule**. Click **Next** to proceed when you are done setting.



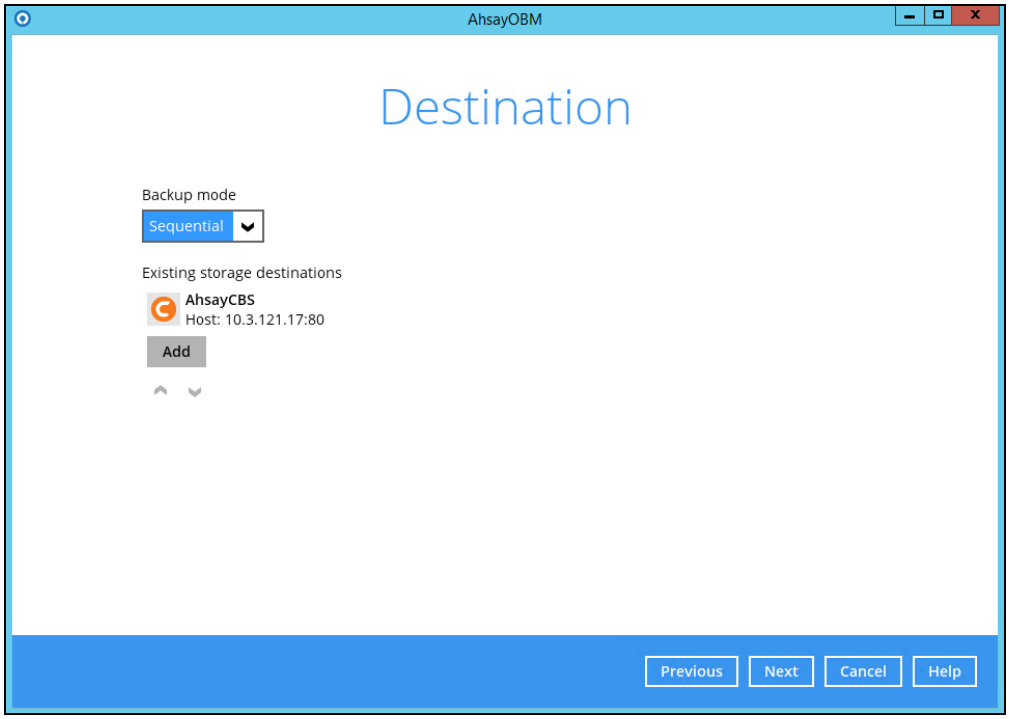
7. In the Destination menu, select a backup destination where the backup mail will be stored. Click the "**+**" icon next to **Add new storage destination / destination pool**.



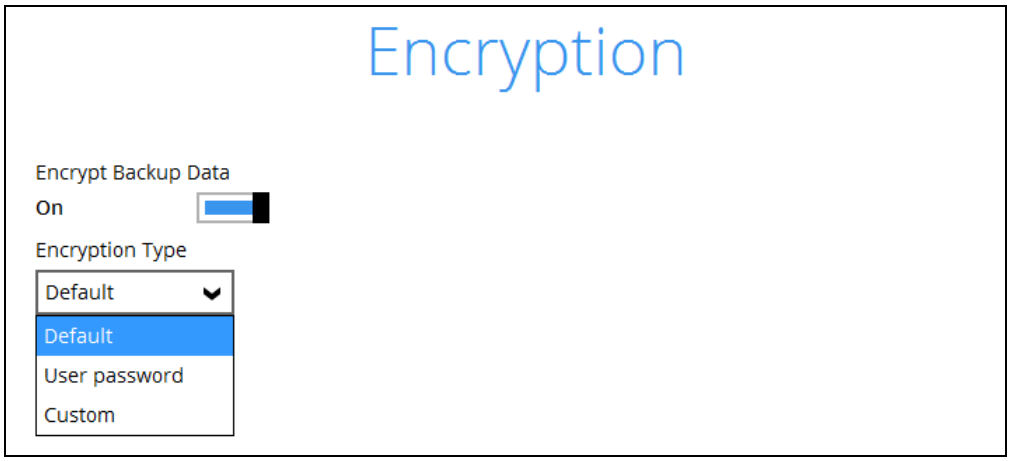
8. Select the destination storage, then click **OK** to proceed.



9. Click **Next** on the Destination menu page to proceed.



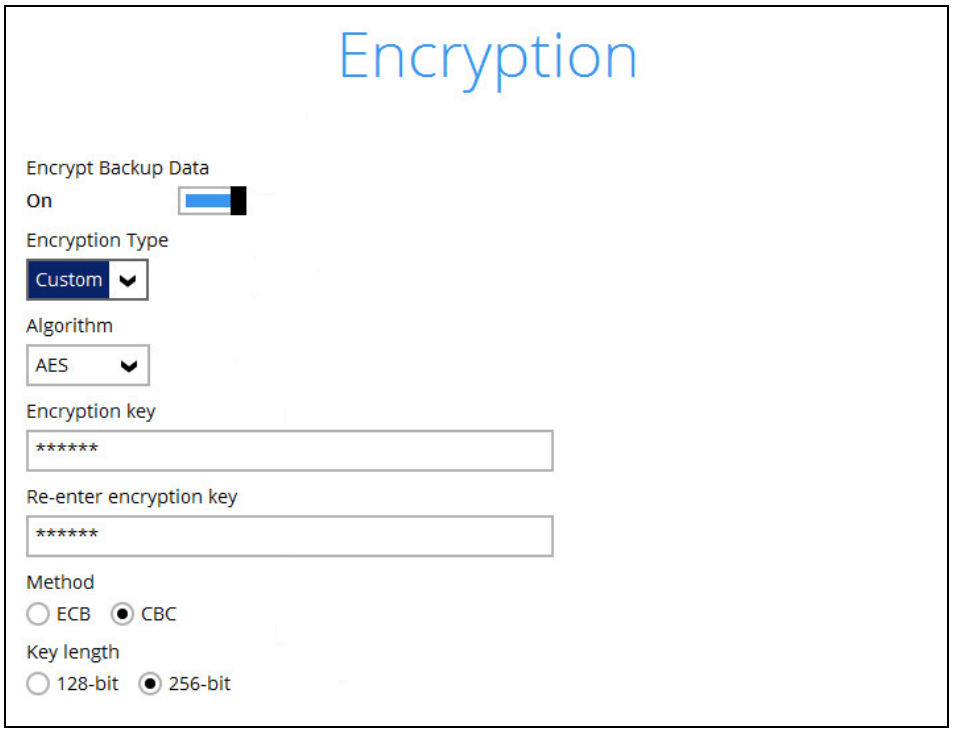
10. In the Encryption window, the default **Encrypt Backup Data** option is enabled with an encryption key preset by the system which provides the most secure protection.



11. 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 AhsayOBM at the time when this backup set is created. Please be reminded that if you change the AhsayOBM 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.

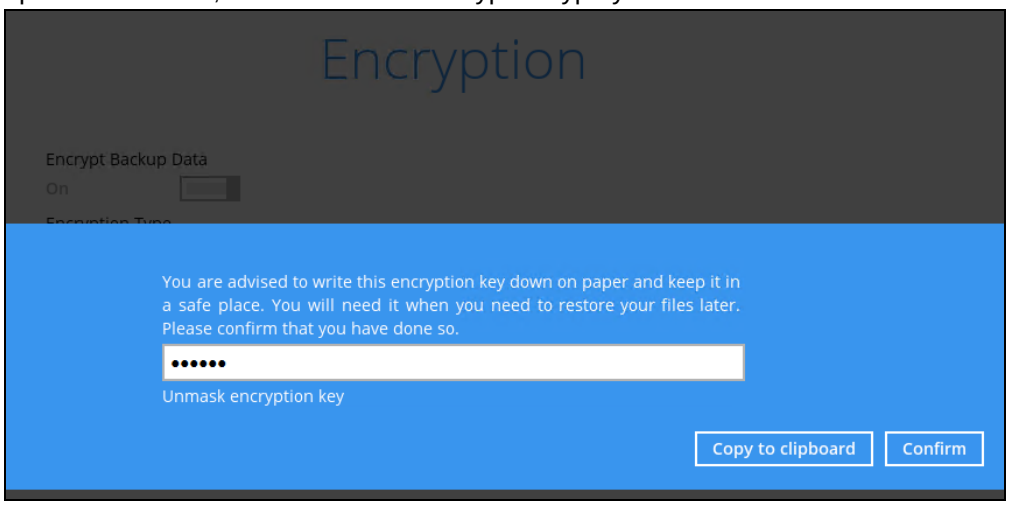


NOTE

For best practice on managing your encryption key, refer to the following article: Best Practices for Managing Encryption Key on AhsayOBM or AhsayACB.

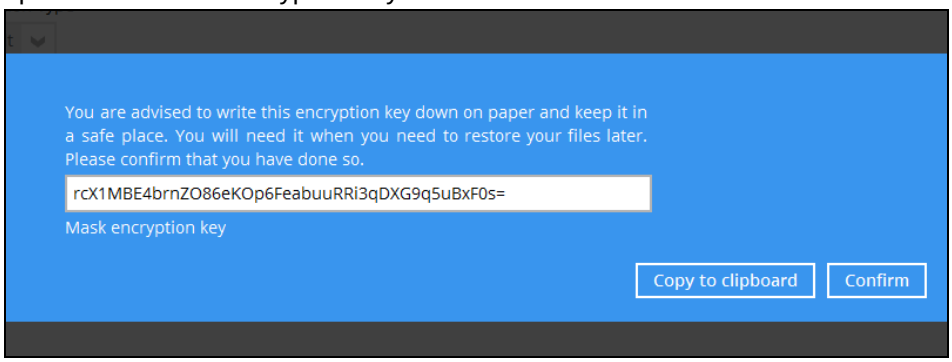
Click **Next** when you are done.

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

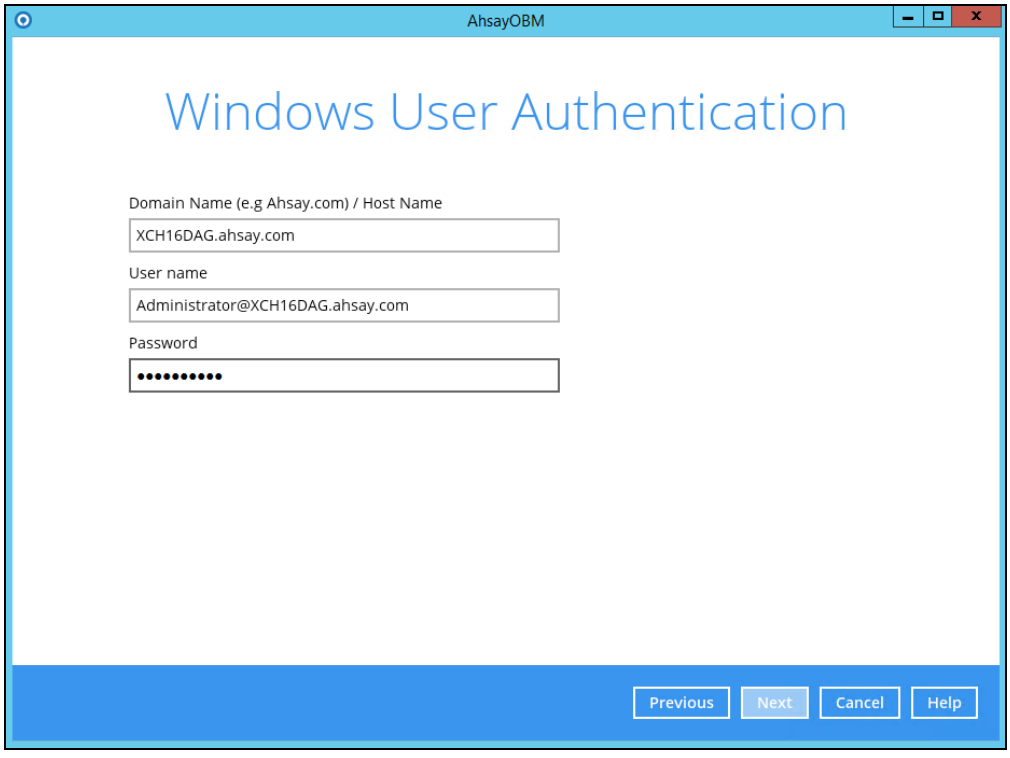
- **Unmask encryption key** – The encryption key is masked by default. Click this option to show the encryption key.



- **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

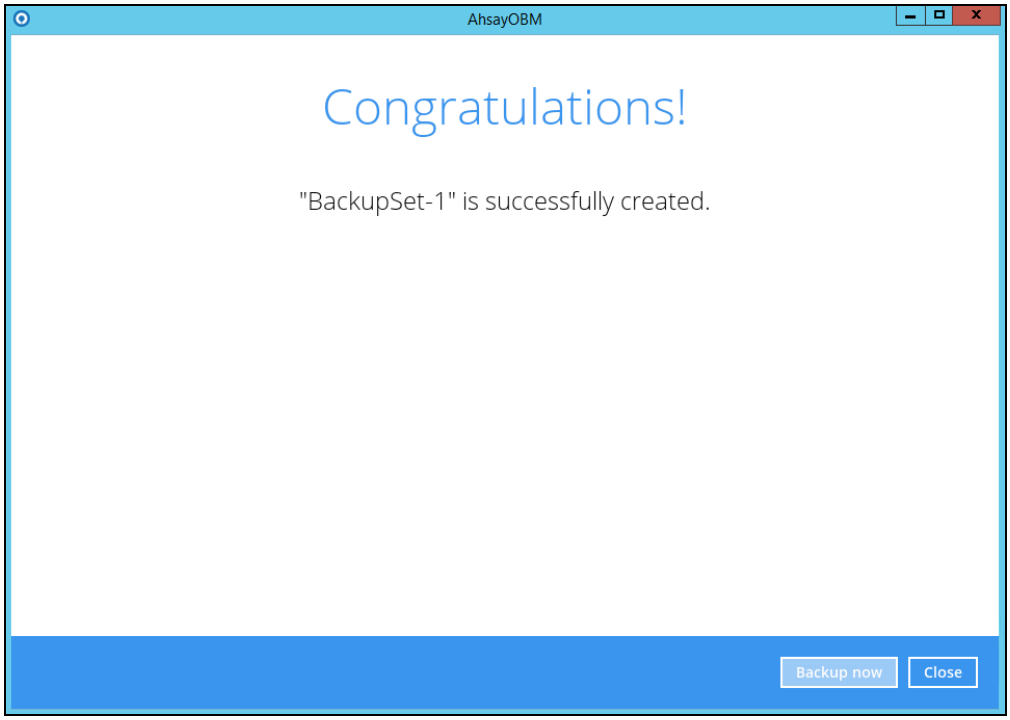
13. Enter the Windows login credentials for user authentication. Click **Next** to proceed. The User name should be entered in the following format “user@hostname”, i.e. administrator@ahsay.com



NOTE

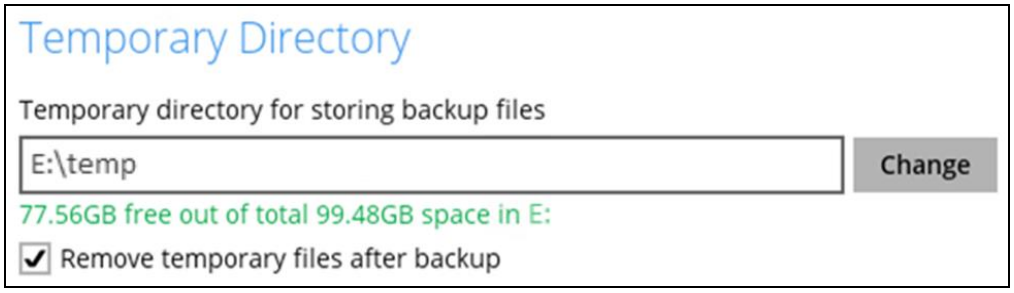
The Windows User Authentication interface will show only if scheduled backup is enabled and set successfully.

14. The following screen shows when the new backup set is created successfully.



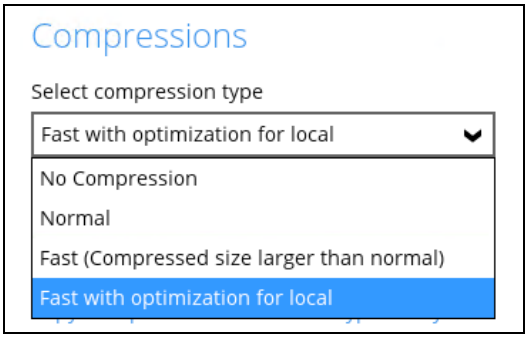
15. Click **Backup now** to start a backup immediately, or you can run a backup job later by following the instructions in Run Mail Level Backup Job.

16. Based on Best Practices and Recommendations, it is highly recommended to set the **temporary directory** to another location other than Drive C: (e.g. Drive E:). To do this, go to **Backup Sets > Others > Temporary Directory** and click the **Change** button to browse for another location.

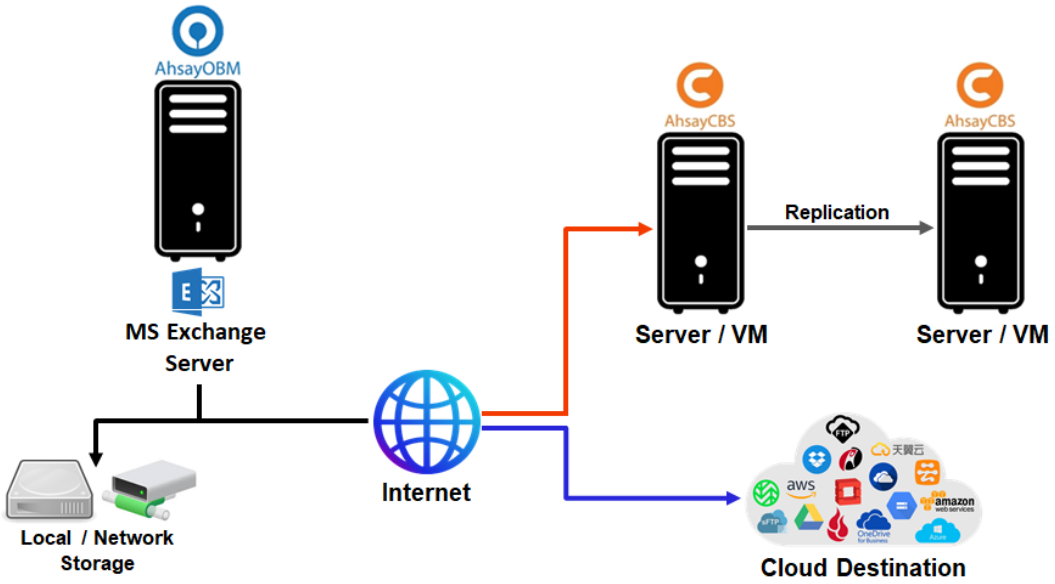


17. Optional: Select your preferred **Compression** type. By default, the compression type is Fast with optimization for local.

    Go to **Others > Compressions**, then select from the following:



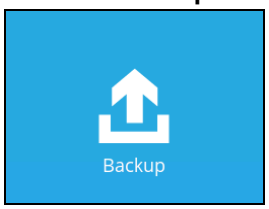
3.1.2 Run Mail Level Backup Job



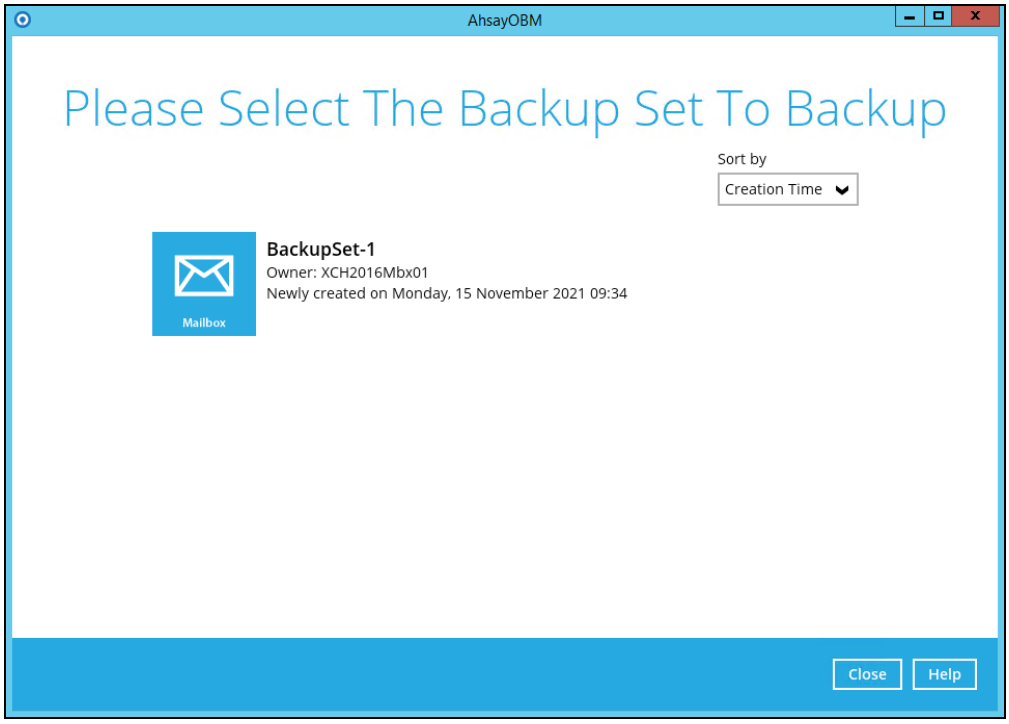
For an overview of the backup process, please refer to Chapter 12 of the AhsayOBM v9 Quick Start Guide for Windows.

Below are the steps of the backup process.

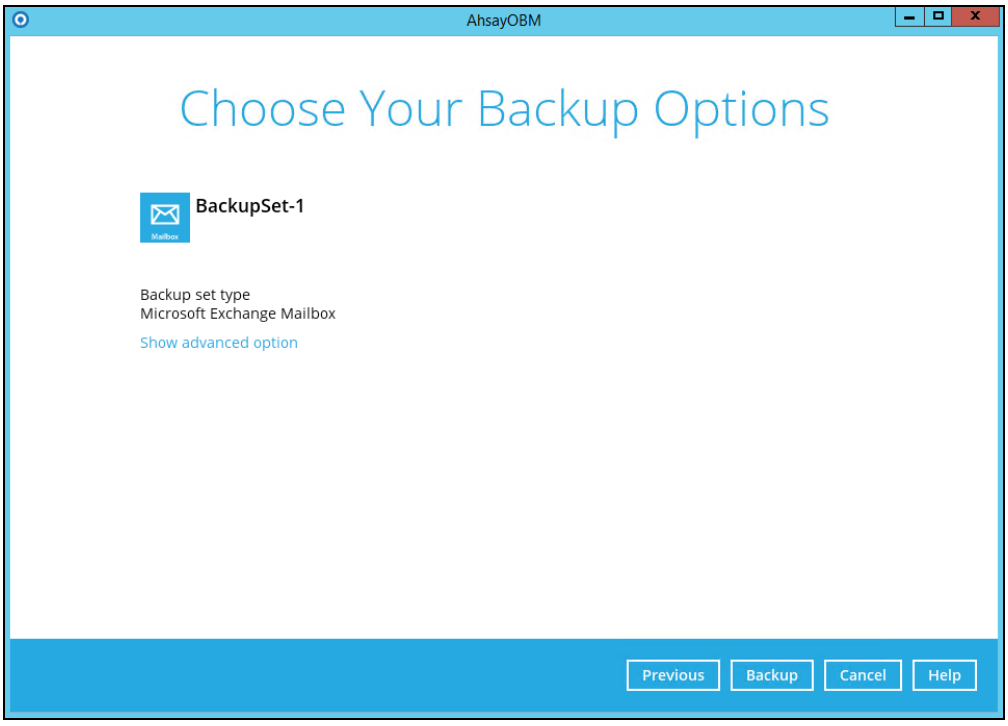
1. Click the **Backup** icon on the main interface of AhsayOBM.

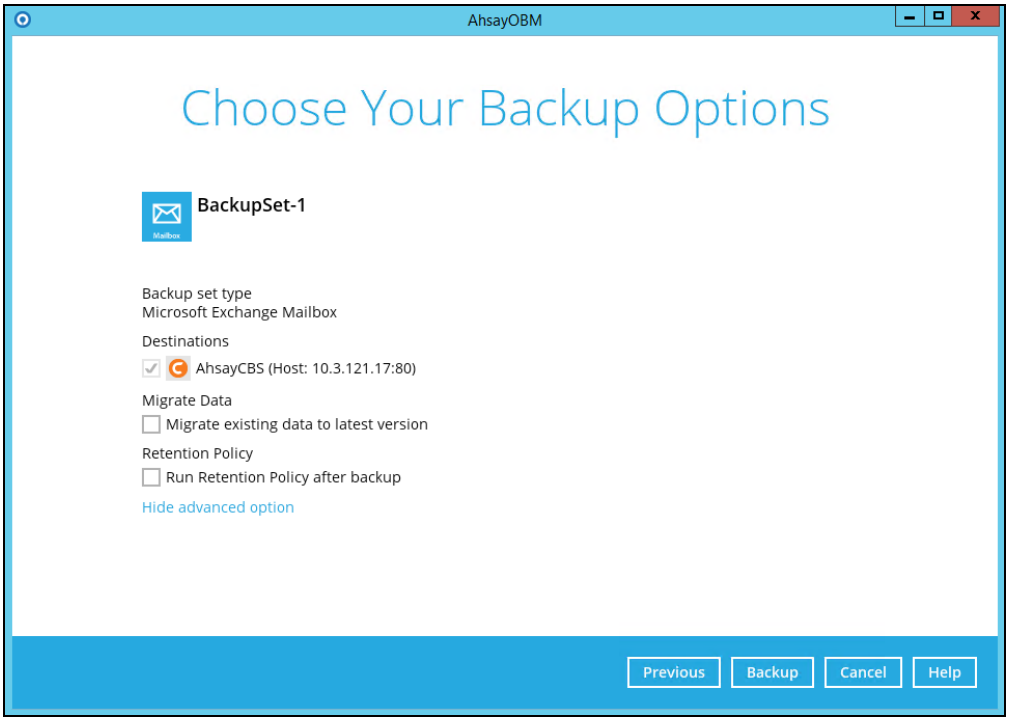


2. Select the backup set which you would like to start a backup for.



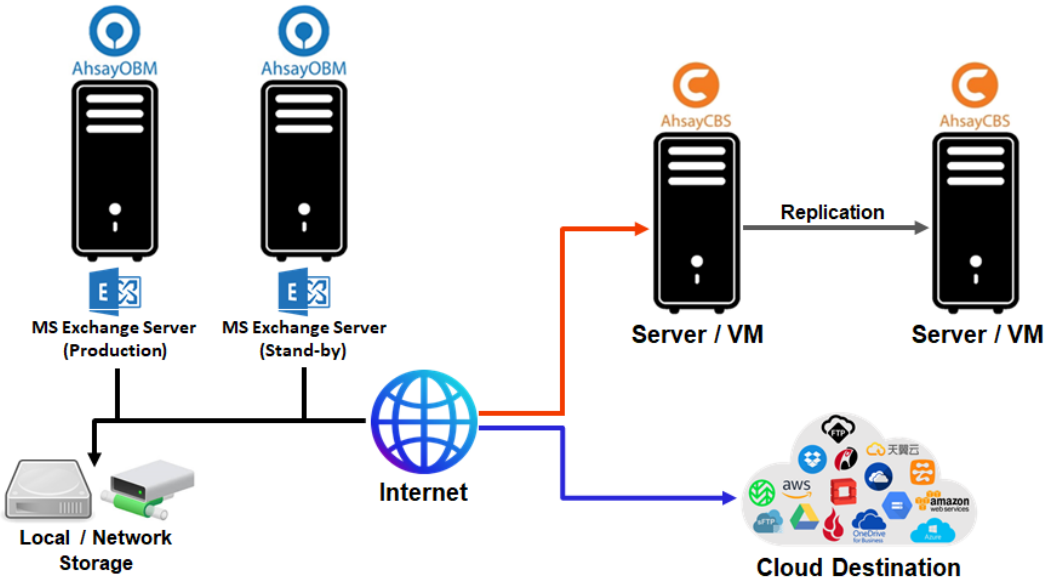
3. If you would like to modify the Destinations, Migrate Data and Retention Policy settings, click **Show advanced option**.





4. Click **Backup** to start the backup.

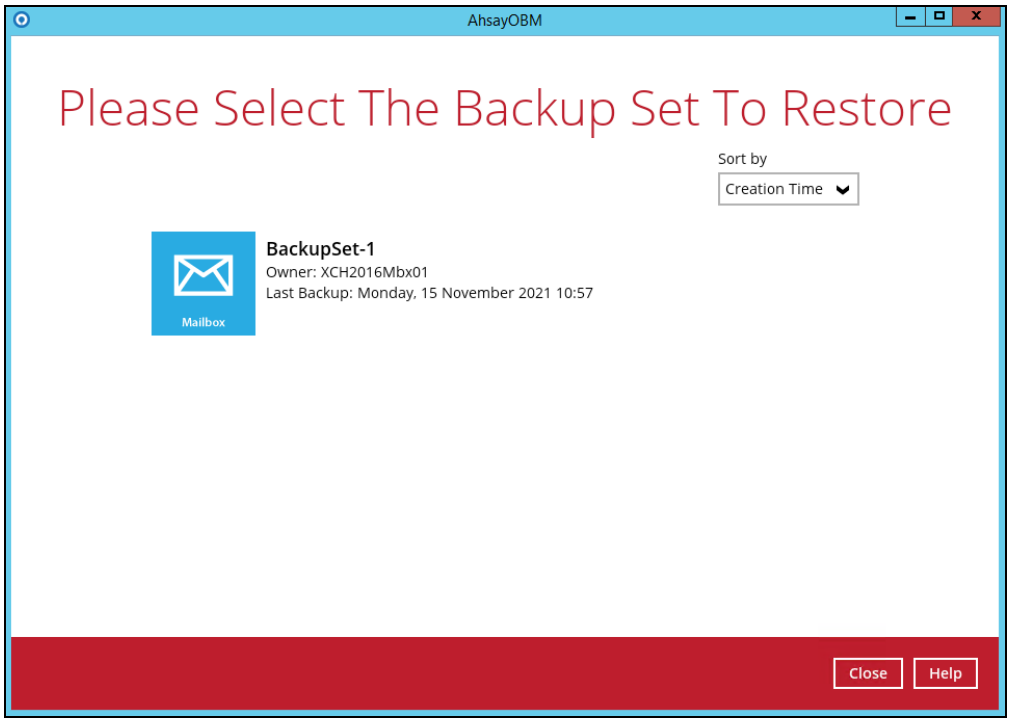
3.1.3 Restore Mail Level Backup



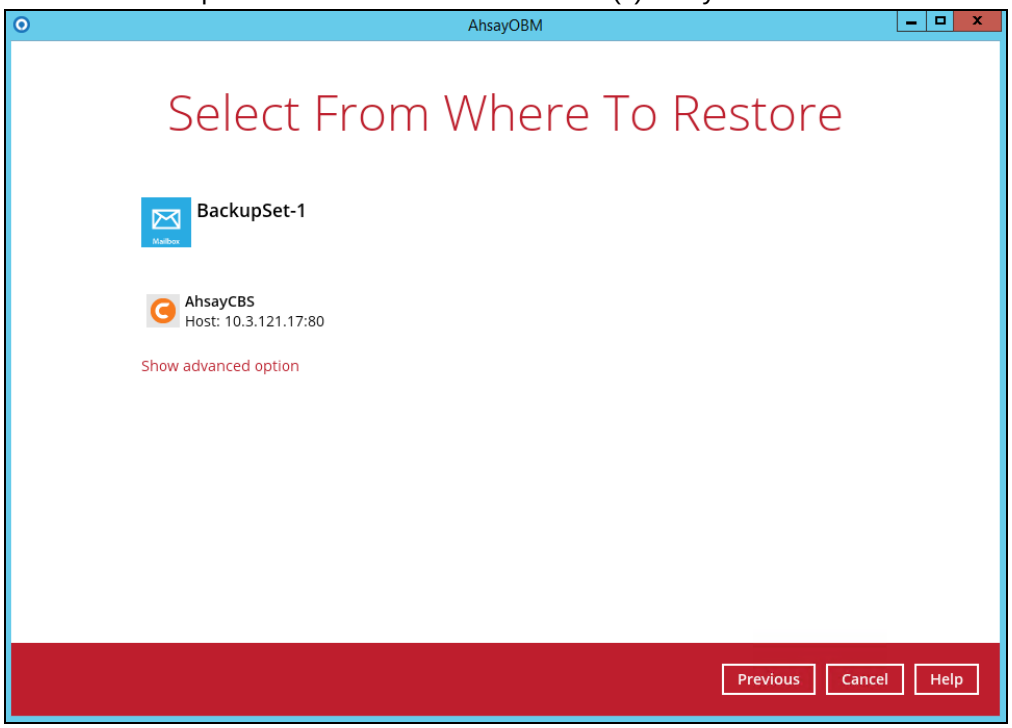
Below are the steps of the restore process.

1. In the AhsayOBM main interface, click the **Restore** icon.

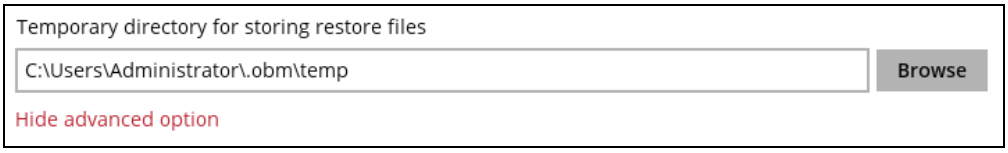
2. Select the backup set that you would like to restore mail from.



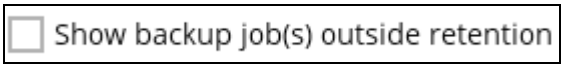
3. Select the backup destination that contains the mail(s) that you would like to restore.



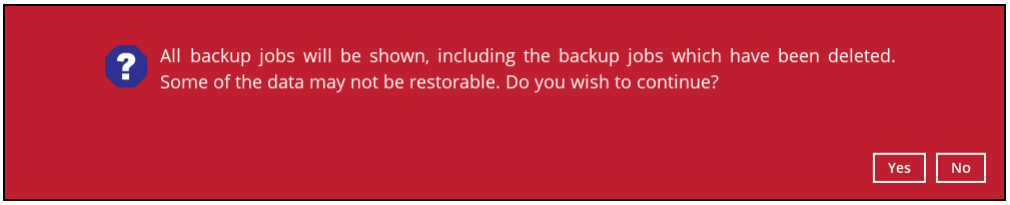
You may configure the **Temporary directory for storing restore files** by clicking **Show advanced option**. This will allow you to select the directory that will be used to store temporary files by clicking the **Browse** button.



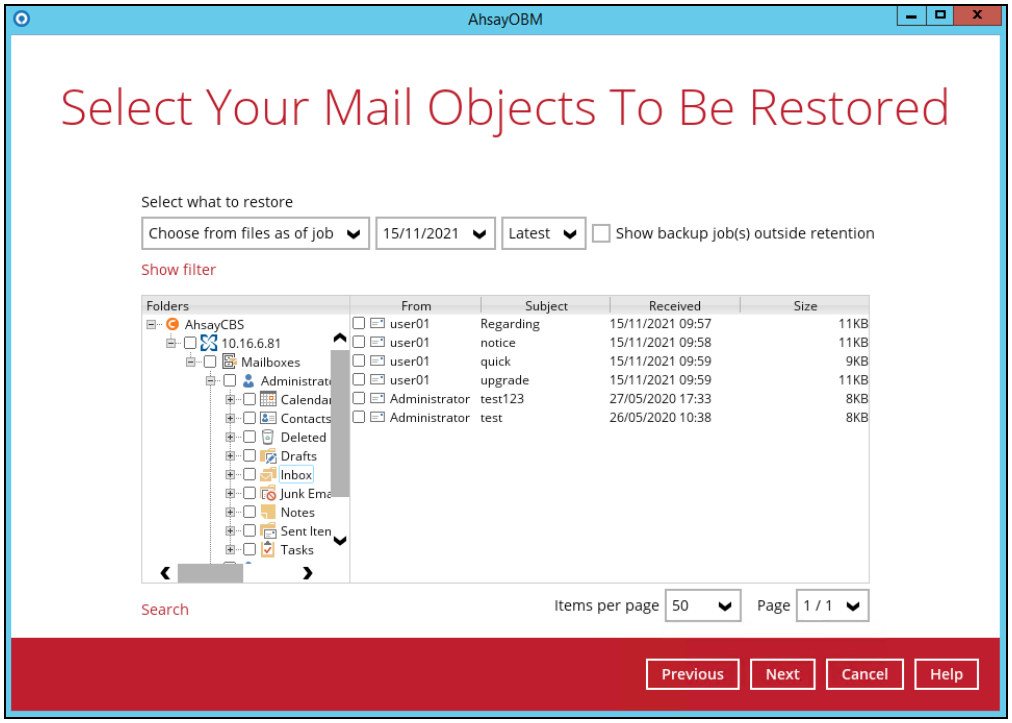
4. Tick **Show backup job(s) outside retention** if you want all backup jobs to be displayed, even the deleted ones.



Once ticked, this message will be displayed. Click **Yes** if you want all backup jobs to be displayed, otherwise click **No**.



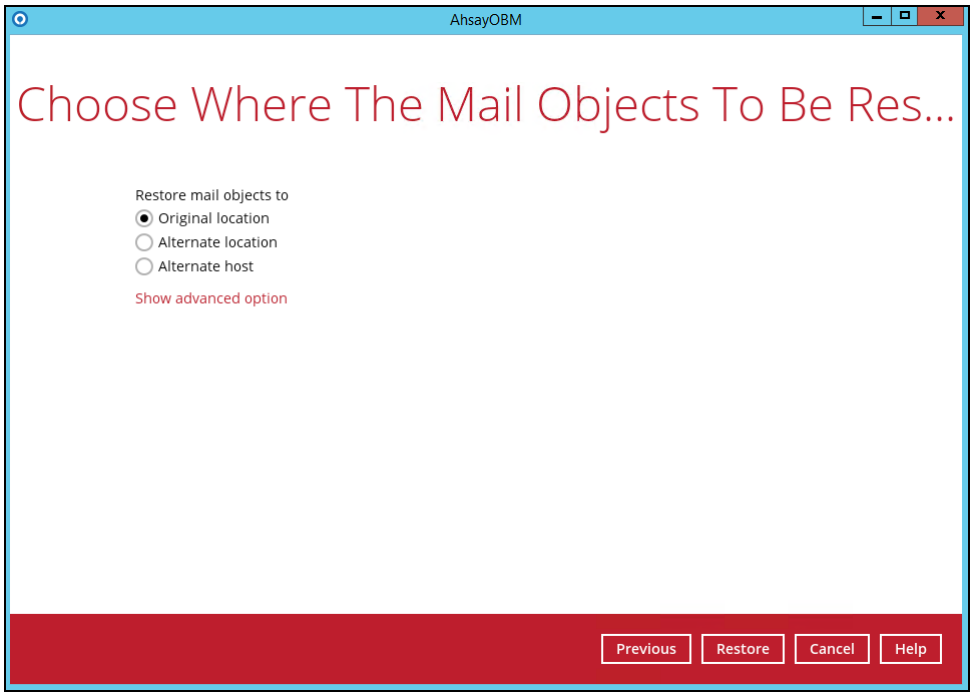
5. Click to expand the menu tree to select which mailbox to restore. You can also select mail item(s) from a specific backup job or all mail items that you have backed up to restore. Click **Next** to proceed.



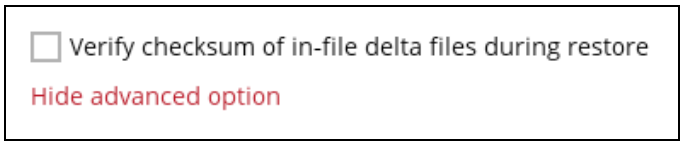
6. Select to restore the mail to their Original location, Alternate location or to an Alternate host.

   - Restore to Original Location

     Select the **Original location** option.



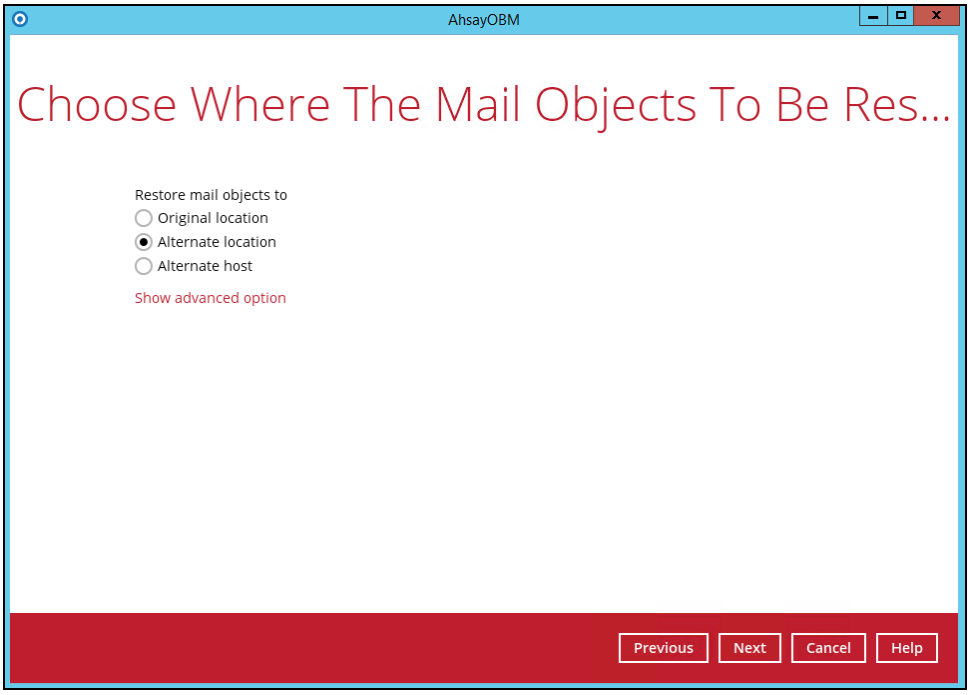
If you would like to modify the Verify checksum of in-file delta files setting, click **Show advanced option.**



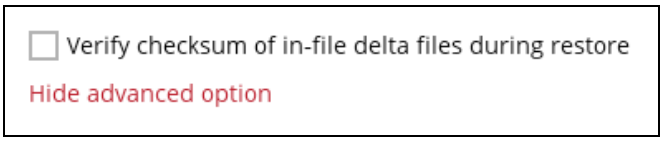
Then click **Restore** to start restoration.

- Restore to Alternate Location

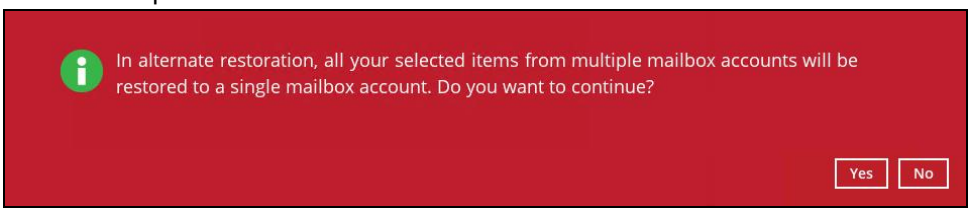
You can choose to restore mailbox item(s) to another mailbox in the same Exchange server. Select the **Alternate location** option.



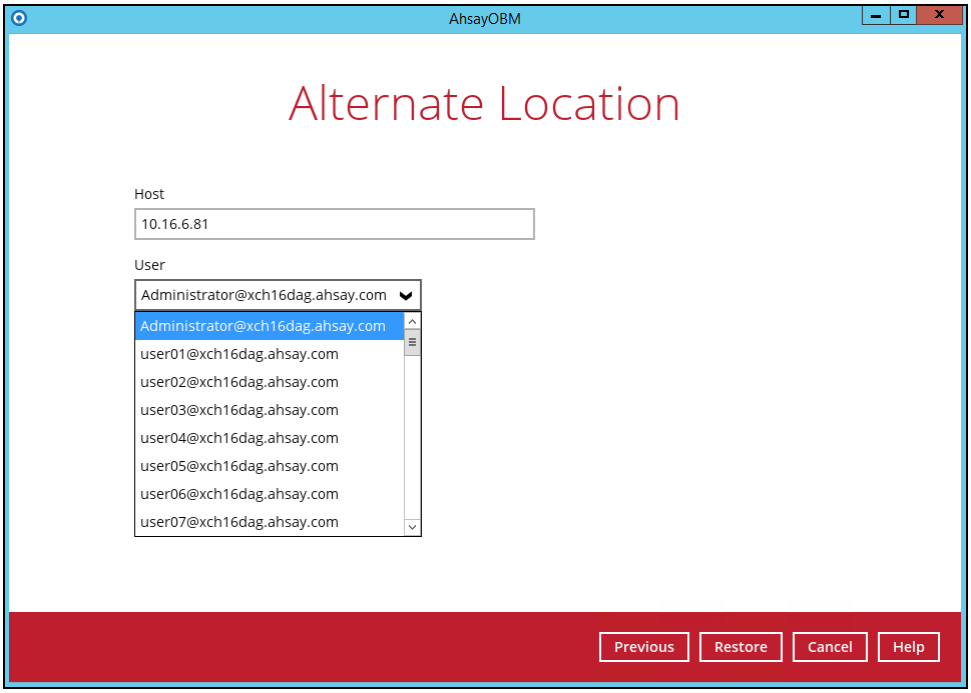
If you would like to modify the Verify checksum of in-file delta files setting, click **Show advanced option**.



Click **Yes** to proceed.



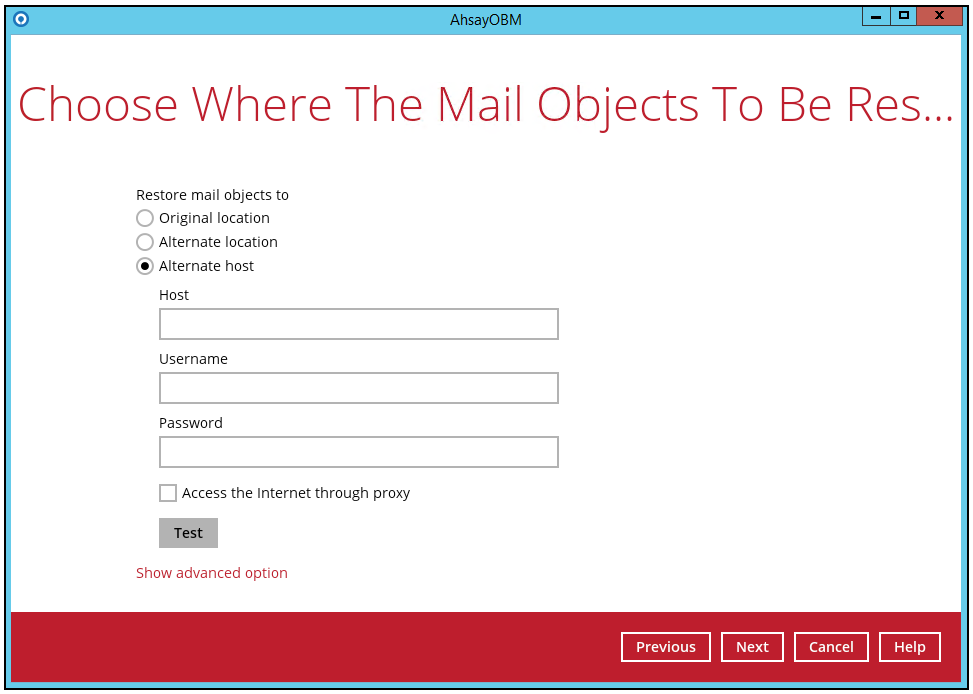
Select the desired mailbox destination.



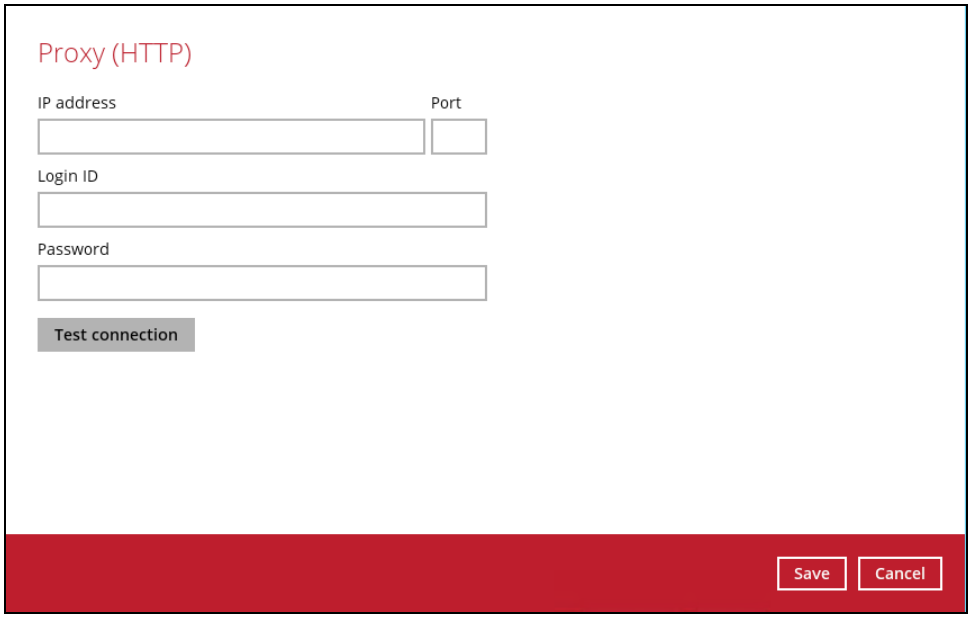
Click **Restore** to start the restoration.

- Restore to Alternate Host

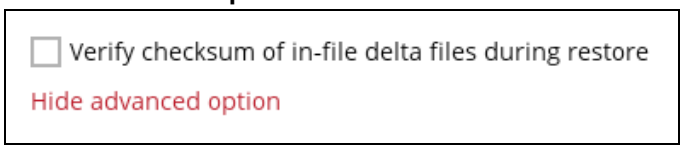
You can also choose to restore mailbox item(s) to a different Exchange server of the same version. Select the **Alternate host** option.



Enter the hostname, username and password of the alternate Exchange server. If you will access the internet through proxy, check the box beside it and set the configuration for the proxy server and click **Save**.

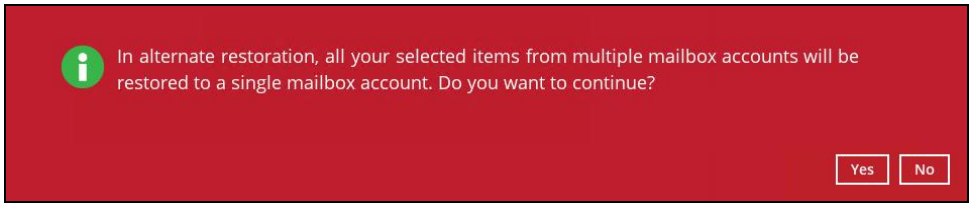


If you would like to modify the Verify checksum of in-file delta files setting, click **Show advanced option.**

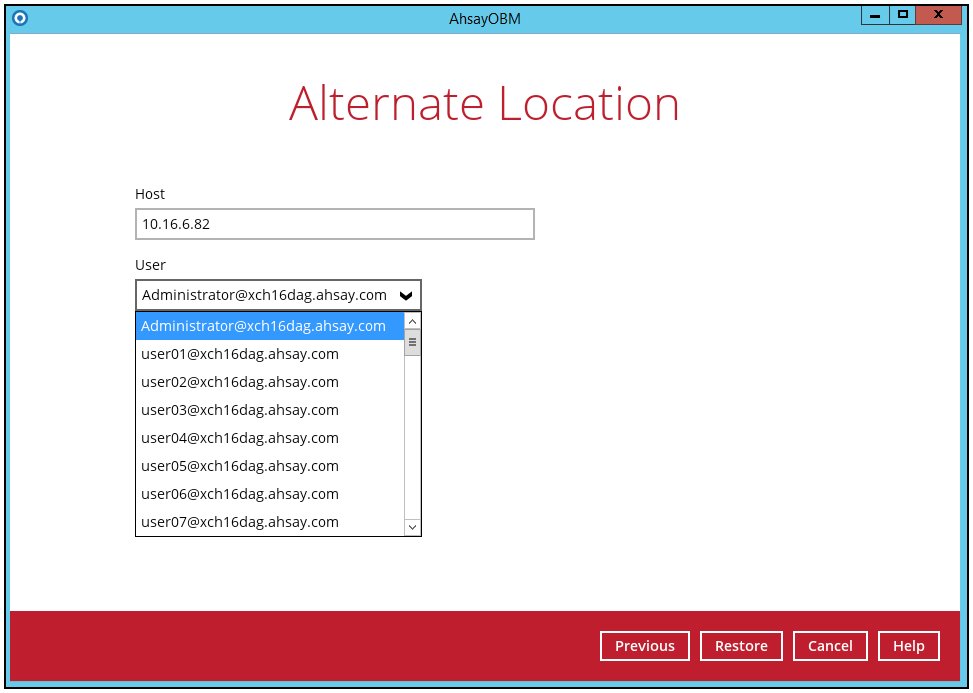


Click **Next to** proceed.

Click **Yes** to proceed.



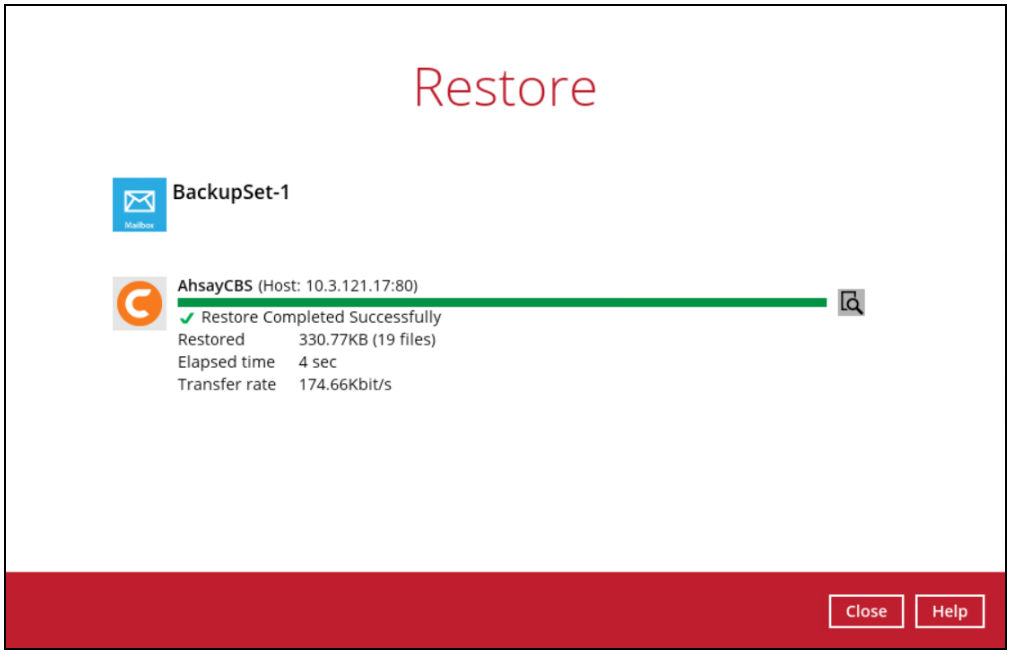
Select the desired mailbox destination.



Click **Restore** to start the restoration.

Please refer to the Limitation part to check for limitation of the restore process.

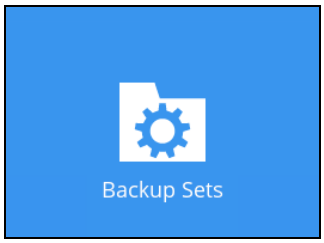
7. The following screen with the text **Restore Completed Successfully** shows when the restoration is completed.



3.2 Database Availability Group (DAG) Backup Option

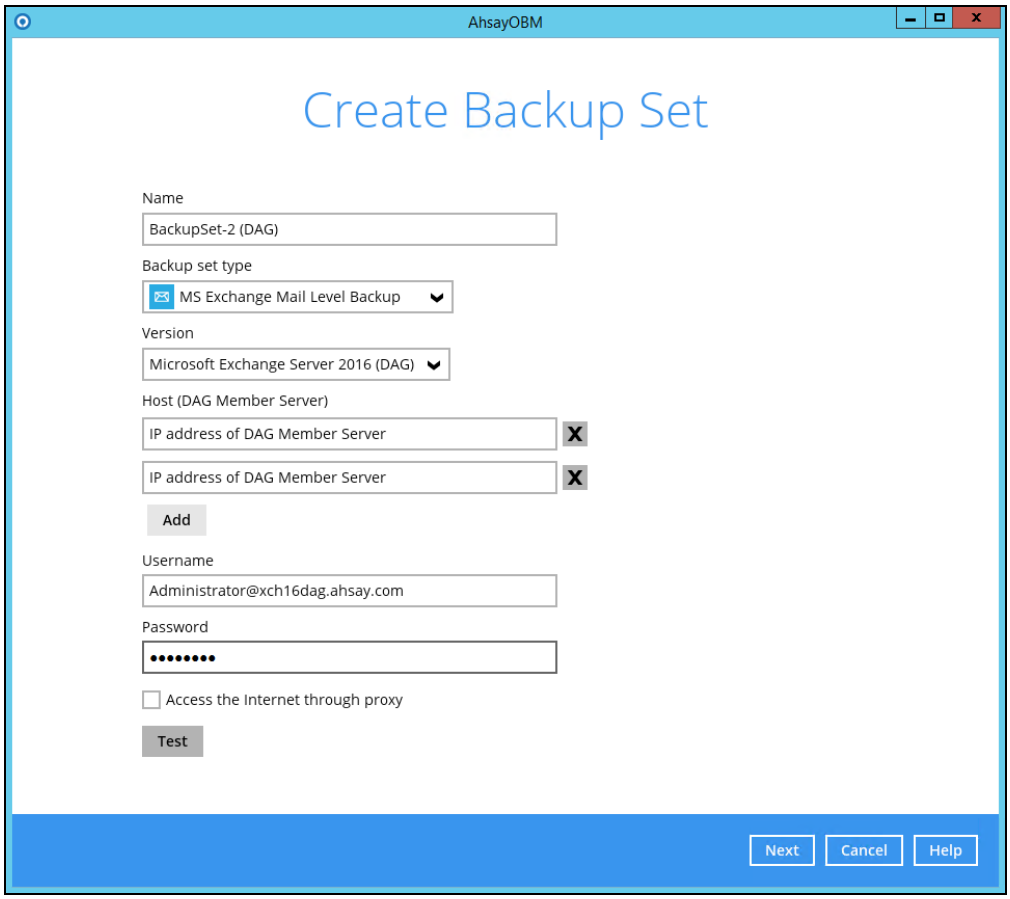
3.2.1 Create Mail Level Backup Set

1. Click the **Backup Sets** icon on the main interface of AhsayOBM.



2. Create a new backup set by clicking the "**+**" icon next to **Add new backup set**.

3. Select the Backup set type as **MS Exchange Mail Level Backup.** The system will automatically detect and select the Exchange Server version, make sure the version selected is correct.



- Name your new backup set.
- Select from the following versions:
  - Microsoft Exchange Server 2013
  - Microsoft Exchange Server 2016
  - Microsoft Exchange Server 2019
  - Microsoft Exchange Server 2013 (DAG)

- Microsoft Exchange Server 2016 (DAG)
- Microsoft Exchange Server 2019 (DAG)

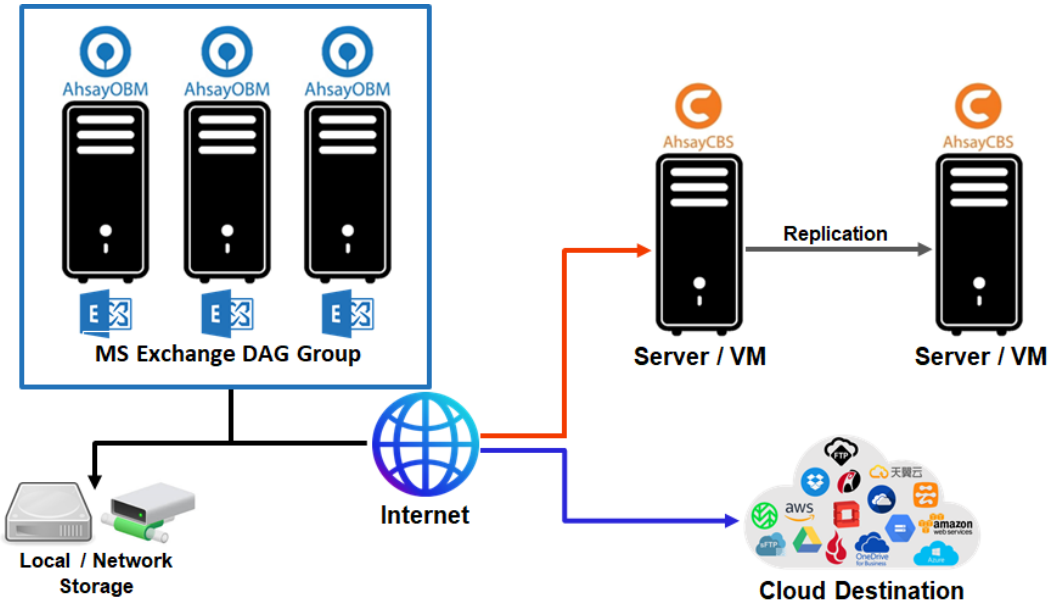
As AhsayOBM is installed directly on the MS Exchange server. The correct MS Exchange version will be automatically selected.

- Enter the hostname of all the DAG Member Server.
- Enter the username and password of the Windows user account used for backup.
- Check the “Access the Internet through proxy” if required.

Then click **Next** to proceed.

4. To finish creating the DAG backup set please refer to steps 5 - 17 discussed in Chapter 3.1.1.

3.2.2 Run Mail Level Backup Job

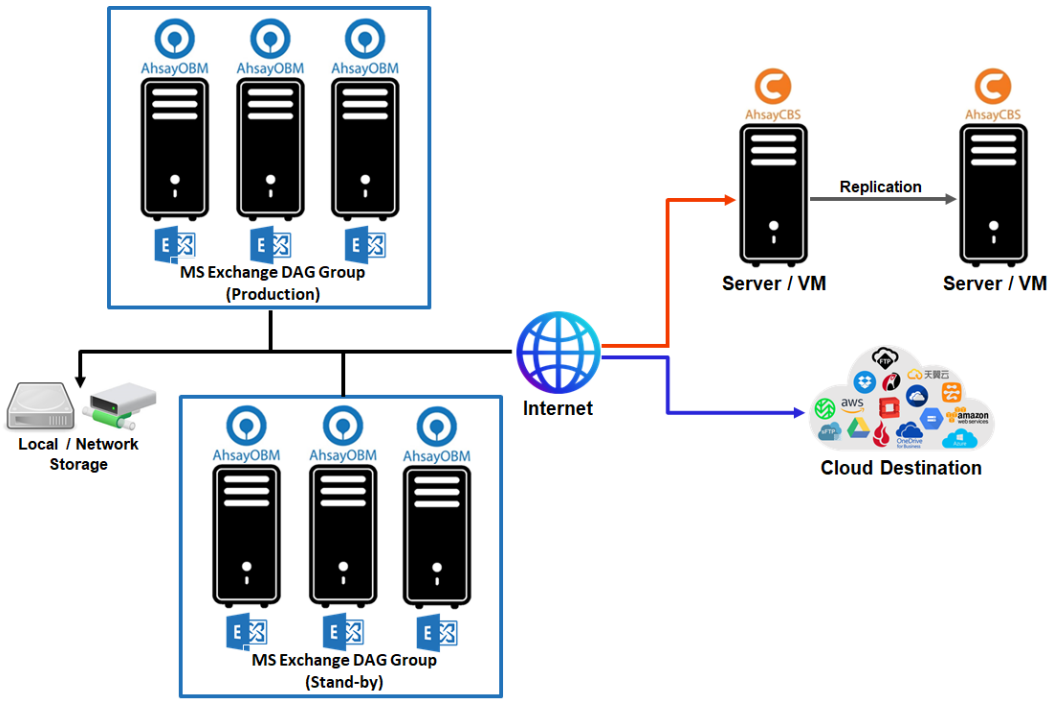


As mentioned in the Requirement section of this guide, if you choose to back up an Exchange DAG setup by installing AhsayOBM on each DAG members, only a scheduled backup that is performed on all DAG members at the scheduled time, will be considered a complete backup. AhsayOBM on all DAG members will start a backup, based on the scheduled time of the backup set at the same time.

A manual backup performed only on individual DAG member will not be considered complete.

Please refer to the Scheduled Backup for Exchange Server in Data Availability Group (DAG) Option for details.

3.2.3 Restore Mail Level Backup



Please refer to Chapter 3.1.3 for instructions on how to perform the restore process.

4 On Remote Backup Machine

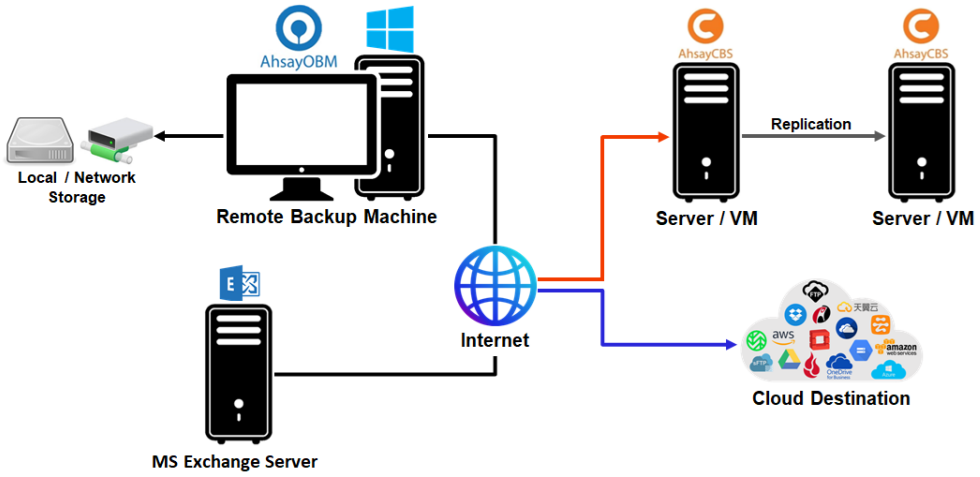
4.1 Standalone Backup Option

4.1.1 Create Mail Level Backup Set

Please refer to Chapter 3.1.1 for instructions on how to create a mail level backup set.

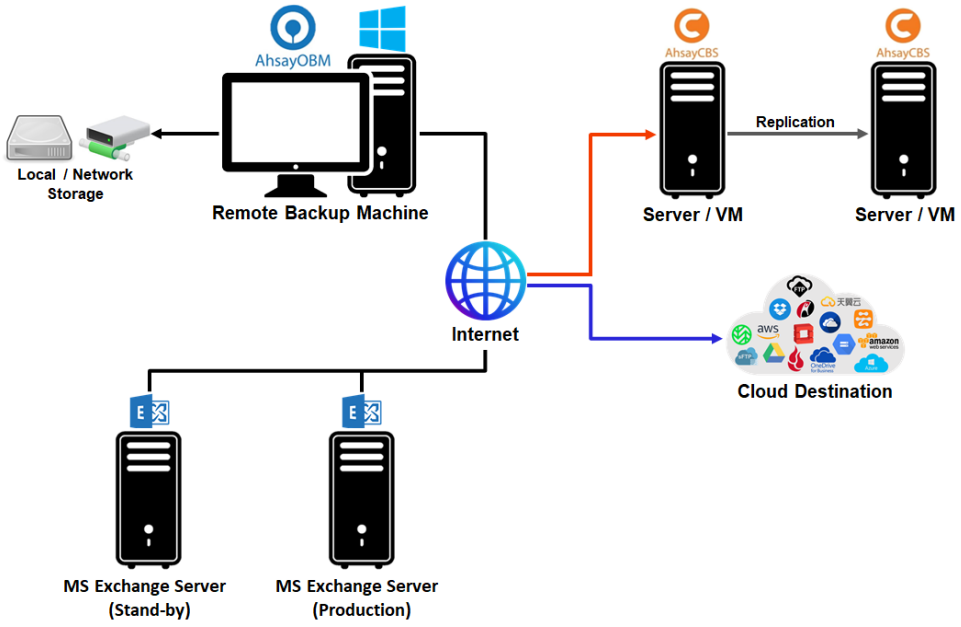
As AhsayOBM is not installed directly on the MS Exchange 2016 / 2019 server, it cannot automatically detect the MS Exchange version. Therefore, the MS Exchange version must be selected manually.

4.1.2 Run Mail Level Backup Job



Please refer to Chapter 3.1.2 for instructions on how to run a mail level backup job.

4.1.3 Restore Mail Level Backup



Please refer to Chapter 3.1.3 for instructions on how to perform the restore process.

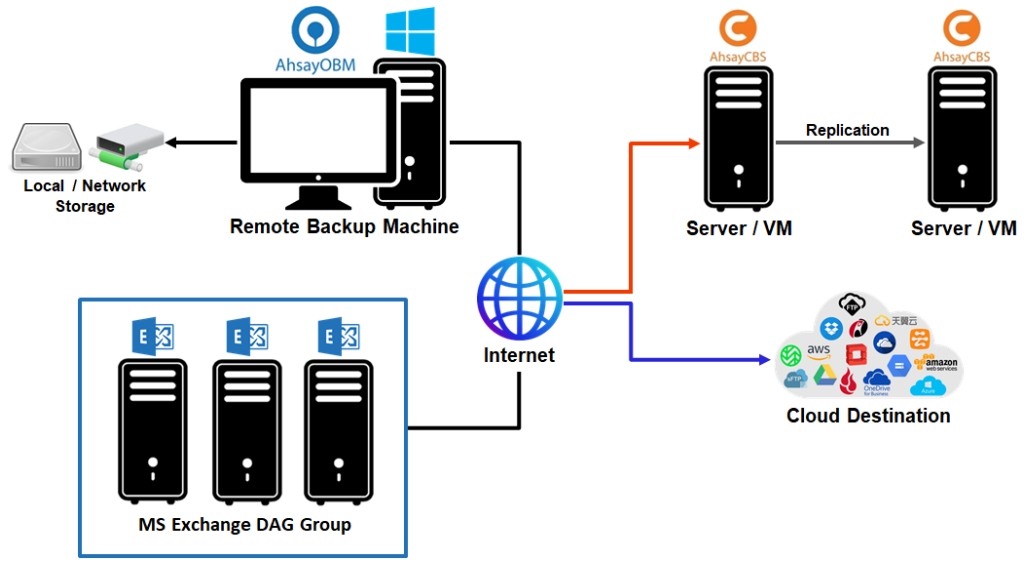
4.2 Database Availability Group (DAG) Backup Option

4.2.1 Create Mail Level Backup Set

Please refer to Chapter 3.2.1 for instructions on how to create a mail level backup set in DAG.

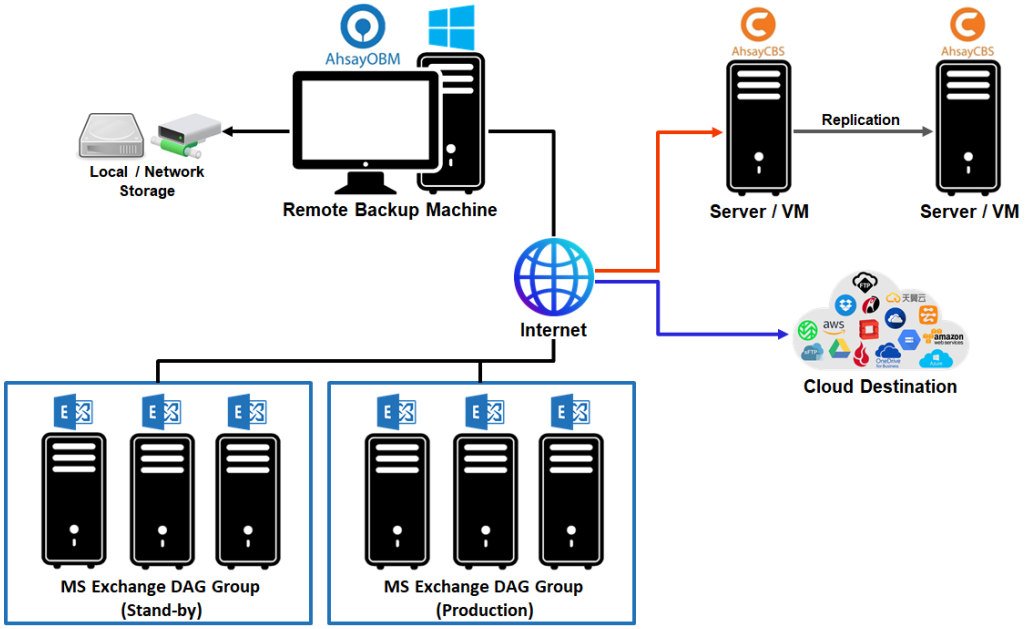
As AhsayOBM is not installed directly on the MS Exchange 2016 / 2019 server, it cannot automatically detect the MS Exchange version. Therefore, the MS Exchange version must be selected manually.

4.2.2 Run Mail Level Backup Job



Please refer to Chapter 3.1.2 for instructions on how to run a mail level backup job.

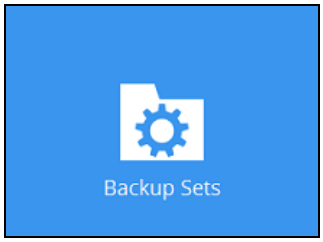
4.2.3 Restore Mail Level Backup



Please refer to Chapter 3.1.3 for instructions on how to perform the restore process.

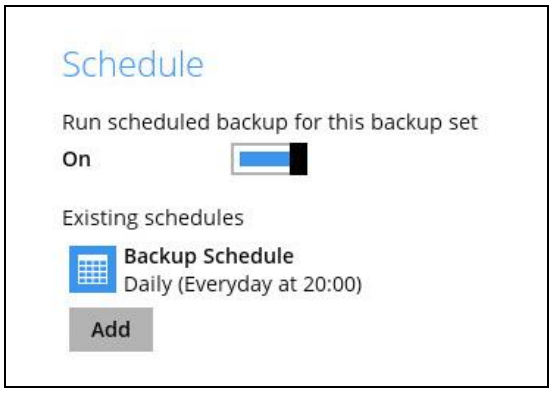
4.3 Configure Backup Schedule for Automated Backup

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

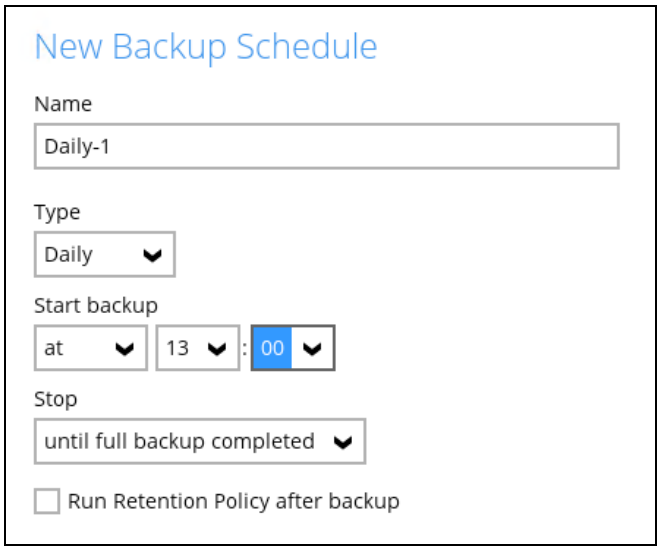


2. All backup sets will be listed. Select the backup set that you would like to create a backup schedule for.

3. Go to the **Backup Schedule** tab. If the **Run scheduled backup for this backup set** option is off, switch it **On**. Existing schedules will be listed if there is any. Click the **Add** button to add a new backup schedule.



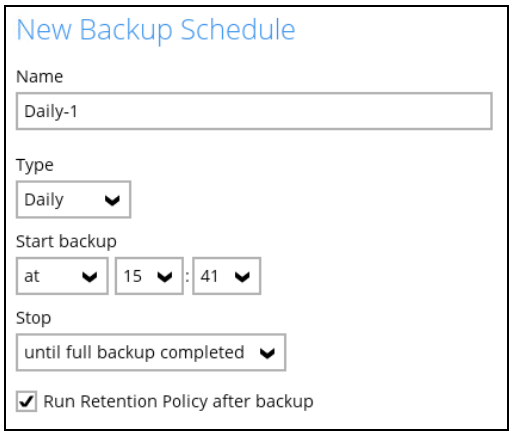
4. The New Backup Schedule window will appear.



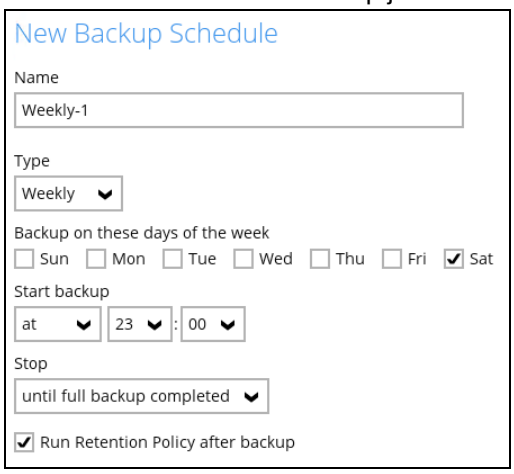
5. In the New Backup Schedule window, configure the following backup schedule settings.

   - **Name** – the name of the backup schedule.
   - **Type** – the type of backup schedule. There are four (4) different types of backup schedule: Daily, Weekly, Monthly and Custom.

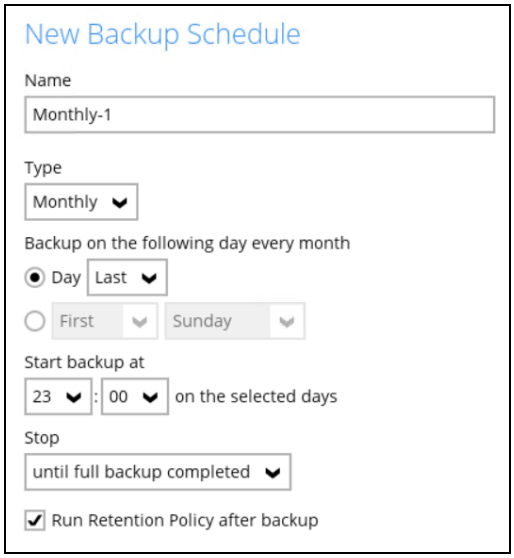
- **Daily** – the time of the day or interval in minutes/hours when the backup job will run.



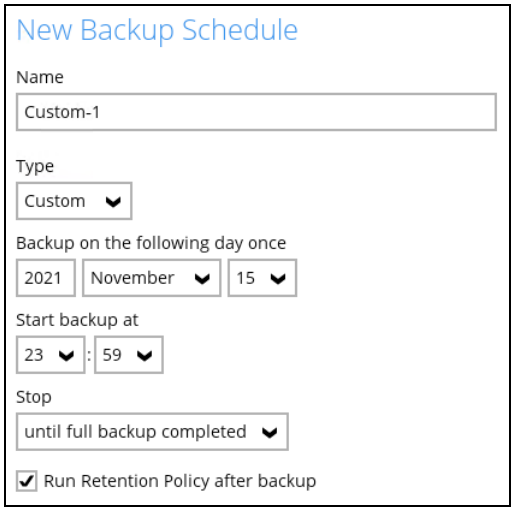
- **Weekly** – the day of the week and the time of the day or interval in minutes/hours when the backup job will run.



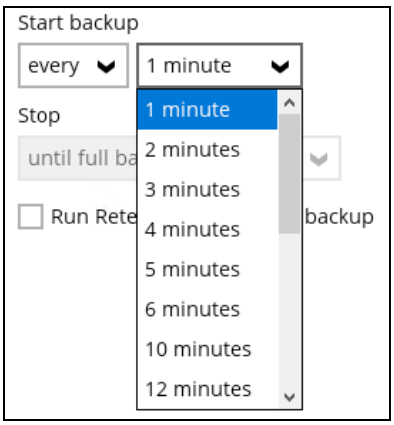
- **Monthly** – the day of the month and the time of that day which the backup job will run.

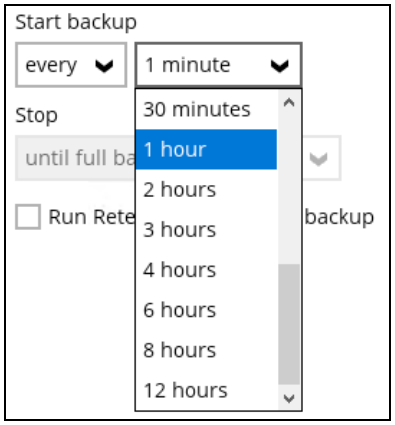


- **Custom** – a specific date and the time of that date which the backup job will run.

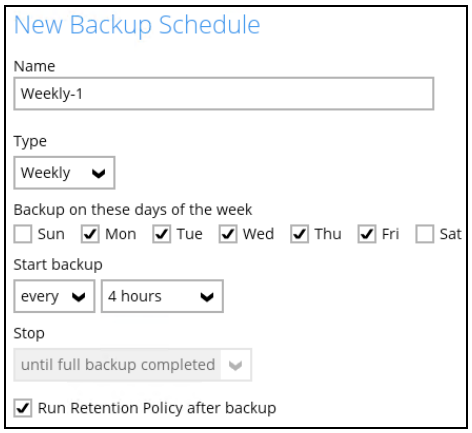


- **Start backup** – the start time of the backup job.
  - **at** – this option will start a backup job at a specific time.
  - **every** – this option will start a backup job in intervals of minutes or hours.





Here is an example of a backup set that has a periodic and normal backup schedule.



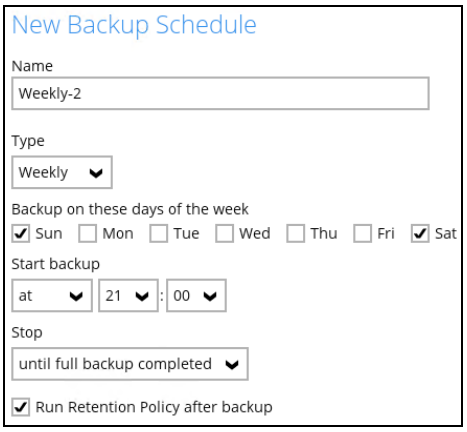


Figure 1.1 ***Figure 1.2***

Figure 1.1 – Periodic backup schedule runs every 4 hours from Monday – Friday during business hours

Figure 1.2 – Normal backup schedule runs at 21:00 or 9:00 PM on Saturday and Sunday on weekend non-business hours

- **Stop** – the stop time of the backup job. This only applies to schedules with start backup "at" and is not supported for periodic backup schedule (start backup "every")
  - **until full backup completed** – this option will stop a backup job once it is complete. This is the configured stop time of the backup job by default.
  - **after (defined no. of hrs.)** – this option will stop a backup job after a certain number of hours regardless of whether the backup job has completed or not. This can range from 1 to 24 hrs.

    The number of hours must be enough to complete a backup of all files in the backup set. For small files in a backup, if the number of hours is not enough to back up all files, then the outstanding files will be backed up in the next backup job. However, if the backup set contains large files, this may result in partially backed up files.

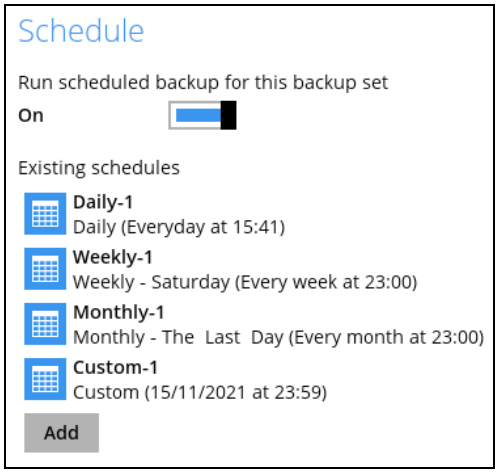
    For example, if a backup has 100GB file size which will take approximately 15 hours to complete on your environment, but you set the "stop" after 10 hours, the file will be partially backed up and cannot be restored. The next backup will upload the files from scratch again.

    The partially backed up data will have to be removed by running the data integrity check.

    As a general rule, it is recommended to review this setting regularly as the data size on the backup machine may grow over time.

- **Run Retention Policy after backup** – if enabled, the AhsayOBM will run a retention policy job to remove files from the backup destination(s) which have exceeded the retention policy after performing a backup job. To save hard disk quote in the long run, it is recommended to enable this option.

As an example, the four types of backup schedules may look like the following:



6. Click **Save** to confirm your settings once done.

5 Contact Ahsay

5.1 Technical Assistance

To contact Ahsay support representatives for technical assistance, visit the Partner Portal:
https://www.ahsay.com/partners/

Also use the Ahsay Wikipedia for resource such as Hardware Compatibility List, Software Compatibility List, and other product information:
https://wiki.ahsay.com/

5.2 Documentation

Documentations for all Ahsay products are available at:
https://www.ahsay.com/jsp/en/home/index.jsp?pageContentKey=ahsay_downloads_documentation_guides

You can send us suggestions for improvements or report on issues in the documentation, by contacting us at:
https://www.ahsay.com/partners/

Please specify the specific document title as well as the change required/suggestion when contacting us.