

Exchange



**Mindtime
Backup**

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ISO 27001
GECERTIFICEERD

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Introduction

In the Backup Pro Manager There are two methods to backup Exchange. These are: "MS Exchange Server Backup" en "MS Exchange Brick Level Backup". It is important to know the differences between the two methods.

"MS Exchange Server Backup" will make a backup from the information store and public folder-databases. The Mindtime Backup Pro Manager makes a request to the Exchange server to dump a copy of its databases into the temporary folder. While the Exchange server copies its databases the server will remain active to serve email, changes will be stored in transaction logfiles. When the copy of the database is completed, Mindtime Backup Pro Manager will calculate and generate the differences (Incremental of Differential) compared to the previous backup.

2007: The temporary folder needs to be large enough to contain 1.5 times the size of the databases.

It is optional to backup the transaction logs as well. To backup the transaction logs, the server needs to log every transaction. The logging behavior is defined by the setting 'circular logging'. If circular logging is disabled, the server logs every transaction. You can find this setting in the information store properties dialog. Transaction logs will be cleared after each database backup.

"MS Exchange Brick Level Backup" will make a backup of the individual emails, calendar-items, and contacts. These items are individually stored and can be placed back into the same exchange server while it is running. This backup method is convenient if someone accidentally deletes a mailbox, email or address book.

This backup method is supplementary to the 'Exchange server backup'. You can only restore the items into the original database, because the database structure is not backed up(things like UserID's, MailboxID's). It is virtually impossible to restore these items into an empty database, so you will always need a recent copy of the exchange database.

"System State Backup" or **"System Backup"**. If you need to rebuild an exchange server, which is also a domain controller then you will also need to restore the active directory. This is stored in a System state backup. The active directory, among other things, stores user information and it mailbox.

The System backup is available in windows 2008, and is actually a copy of a system drive. It is like a copy of the C: drive. This type of backup is usually very large and because of the size it is harder to manage.

In this manual we will first create a "System State backup" and then a "Exchange Server Backup" and optionally a "Mail Level Backup".

1. System State Backup / System Backup

For the full recovery of a domain controller with an Exchange server it necessary to backup the Active Directory as well.

In Windows 2008/2012 the backup is done by "WBAAdmin" (Windows Backup). Windows Backup creates a different type of backup and the files are approximately 5 GB after compression.

System State backup: <http://technet.microsoft.com/en-us/library/cc785306%28WS.10%29.aspx>

System Backup: <http://technet.microsoft.com/en-us/library/cc732091.aspx>

1.1. Create a backupset and schedule the backup

Important: First you have to check wether the feature "Windows Backup" has been installed in the Server Manager. If not this feature needs to be added using the "Add feature" wizard.

To create a System State backup proceed as followed:

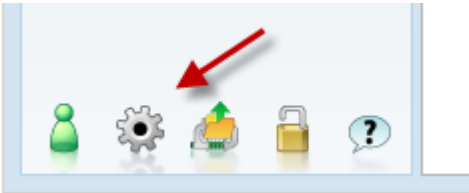


fig. 01 – Backup settings

Open the Backup Pro Manager and click "Backup settings" (cog) .

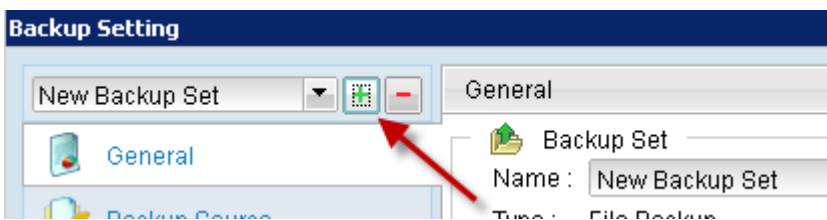


fig. 02 – Nieuwe backupset

Click the green "+" on top add a new backup set to the account.

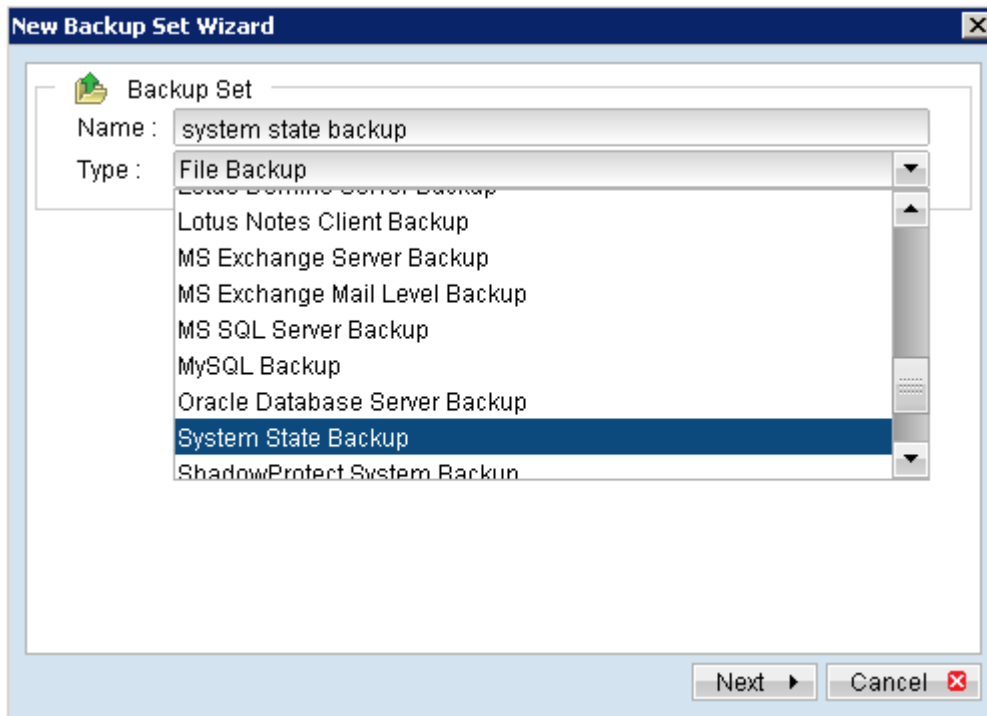


fig. 03 – Set type

Choose a clear name for the set which allows you to identify it in the future like "System State set Server A". For backup type select the "System State Backup" or "System Backup" and click "Next".

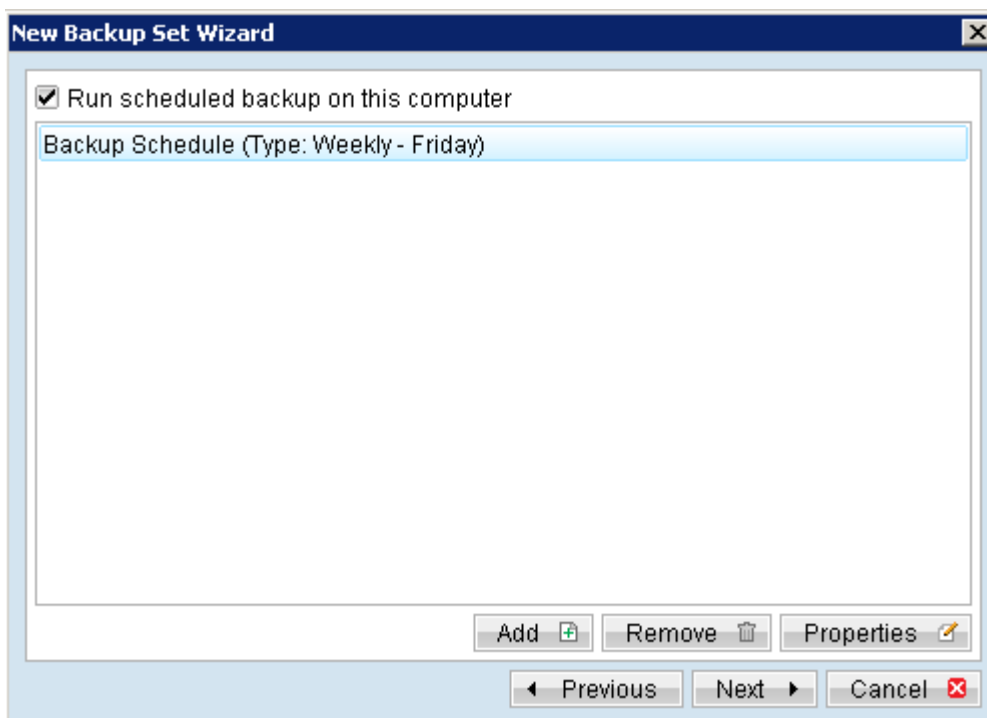


fig. 04 – Backup schedule

Choose "Backup Schedule" and click "Next".

1.2. Encryption

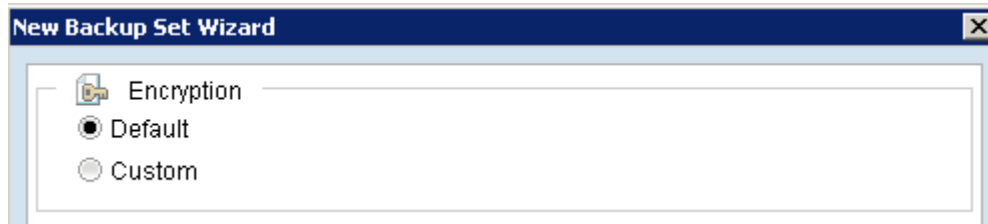


fig. 05 – Encryption

You have to choose the encryption settings for this set. Encryption settings can only be chosen while creating the set for the first time.

"Default": Uses the current account password used to login as the encryption key. Changing the account password in the future does not alter the encryption key. **Because of this we recommend choosing the Custom option and writing the settings down somewhere safe.**

The encryption key will never leave the machine it was created on. All data is encrypted and compressed prior to upload to the offsite backup servers. **!! Losing the encryption key is the same as losing the data !!**

The recommended settings are: Custom, AES, ECB, 256-bit

After choosing the encryption settings click "OK".

The "System State Backup" or "System Backup" is now created.

Tips:

- Read the chapter [Efficient Quota usage](#) to reduce the space used by this set.
- Microsoft requires that the temporarily location used by the software for the "System" and/or "System State" backup are not on a critical volume (It cannot be part of the backup itself).

2. Efficient Quota usage

The use the available space as efficiently as possible we're going to adjust the delta settings in the software. The systemstate.bkf file changes daily. An incremental backup is the difference between now and the previous backup. The previous backup can be a full, differential or incremental backup. By default the software creates only incremental backups which can create long chains of linked backups.


















<input type="checkbox"/>		[I] SystemState.bkf	26.45M	2009/08/31 07:02	6.11M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	25.88M	2009/08/24 07:03	6.02M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	25.89M	2009/08/17 07:02	6.17M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	25.69M	2009/08/10 07:03	5.98M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	25.61M	2009/08/03 07:02	5.96M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	25.75M	2009/07/27 07:03	6.01M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	26.03M	2009/07/20 07:02	6.2M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	25.61M	2009/07/13 07:03	5.96M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	25.67M	2009/07/06 07:02	5.99M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	25.7M	2009/06/29 07:03	6.02M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	23.88M	2009/06/22 07:02	5.47M	[77%]
<input type="checkbox"/>		[I] SystemState.bkf	27.68M	2009/06/15 07:03	6.81M	[75%]
<input type="checkbox"/>		[I] SystemState.bkf	25.45M	2009/06/08 07:02	5.92M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	25.61M	2009/06/01 07:03	5.93M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	23.24M	2009/05/25 07:02	5.37M	[76%]
<input type="checkbox"/>		[I] SystemState.bkf	22.35M	2009/05/18 07:03	5.23M	[76%]
<input type="checkbox"/>		SystemState.bkf	286.33M	2009/05/17 12:58	107.61M	[62%]

fig. 06 – Retention long

This overview shows what is stored on a backup server. Files with a [I] are incremental backups. Files with a [D] are differential backups. Files without either or full backups.

The backup server is not allowed to remove the intermediary files because their all needed to reach the latest backed up version of the file. e.g. yesterday's backup.

To stop the server from creating these long chains we're to add a differential backup.

Differential backups are the difference between now and the last full backup.

Depending of the chosen retention policy a weekly or monthly differential backup can be created. For a 7-14 day retention policy a weekly differential backup is best and for a 30-60 day policy a monthly differential is best.

After the retention policy has expired the software can remove the incremental and differential backups which are older to make room again in the account.

The software will always keep a Full version plus the required differential and incremental files the guarantee the chosen retention policy.

2.1. Compression

A new set is always created with the compression set to “Fast” which speeds up the preparation process but results in more data being uploaded and stored in the account.

We advise to set this to “Normal” so the data is compressed better before being uploaded to the backup servers. Changing this setting only applies to the backups that will run from then on, this will not recompress data already stored on the backup servers.

Open the Backup Pro Manager and go to settings and select a backupset for which you wish to change the settings. (These settings are unique per set and do not apply to the entire account).

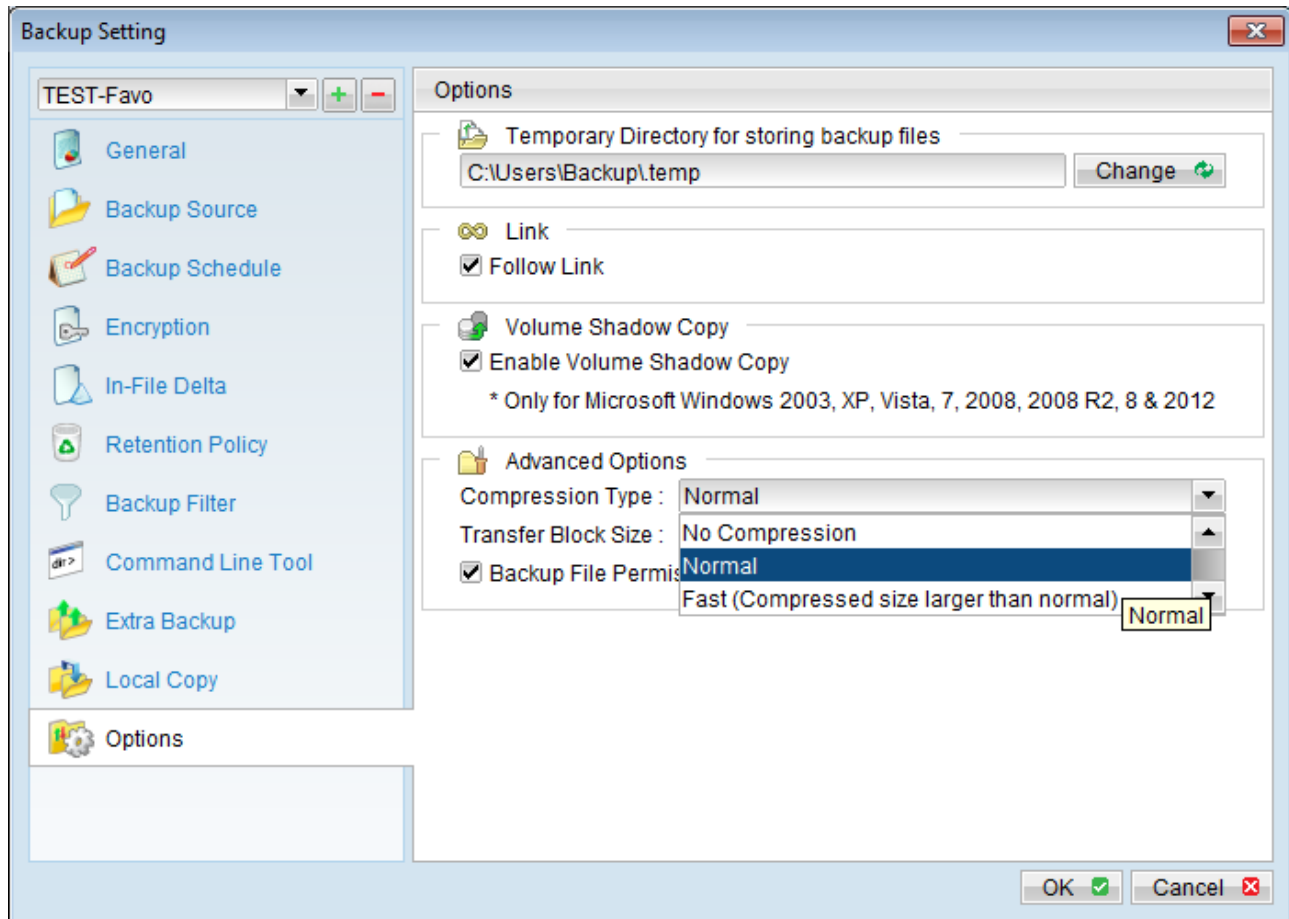


fig. 07 – Compression

Go to “Options”. Under Advanced switch the compression type from “Fast” to “Normal”

2.1. In-File Delta

Open the software, go to the backup set settings and select the backupset you want to modify. (These settings are unique per set and do not apply to the entire account)

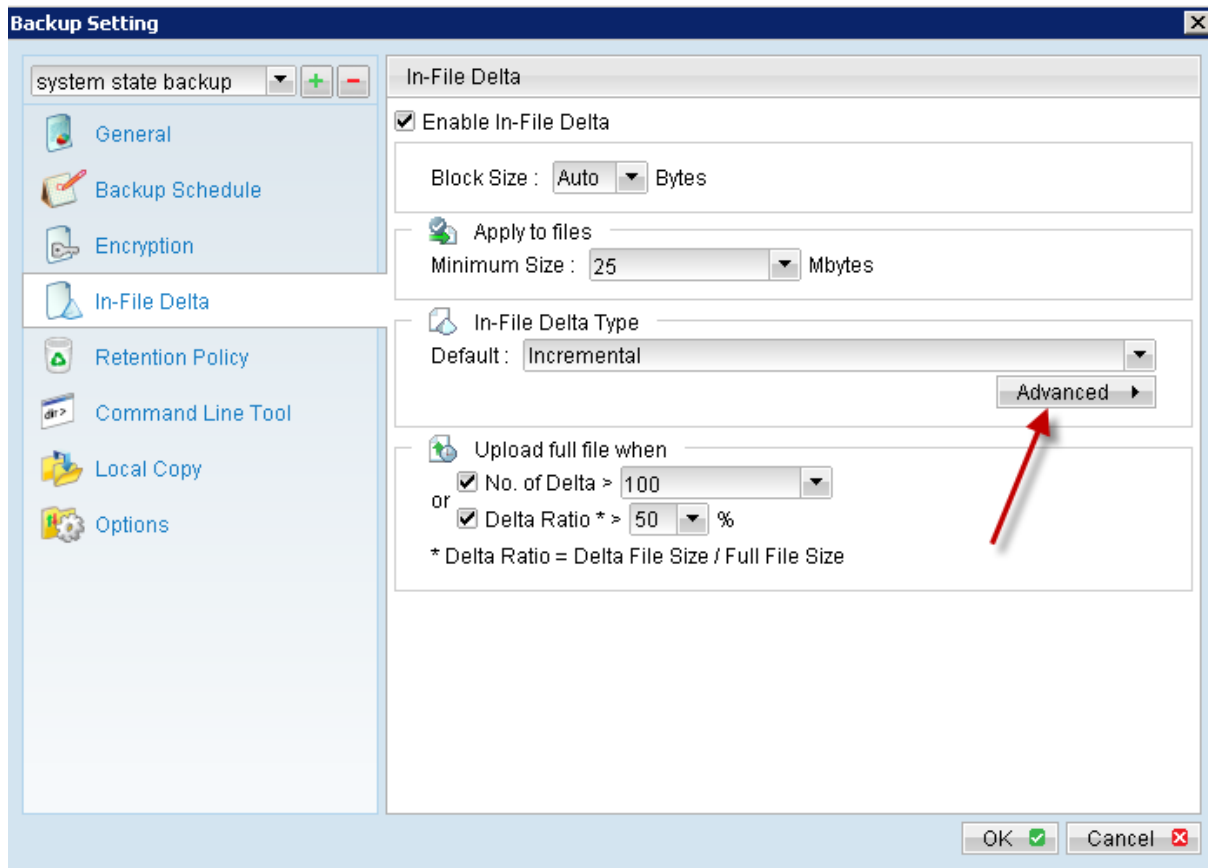


fig. 08 – In-File Delta

Click on "In-File Delta". In-File Delta stands for: changes made in a file.

Leave the "Block Size" on "Auto". The OBM can determine the correct size. If however you know what the file looks like on block level you can change the settings.

By default all subsequent backups after the first one are incremental backups which is the most efficient setting. This means that only the changes are uploaded to the servers.

After a while the chains become long and when they either reach 100 versions or 50% or more is changed since the previous backup the full file will be backedup. These settings can be left alone as well.



Click on "Advanced" then enter a deviation of the default settings for In-File-Delta.

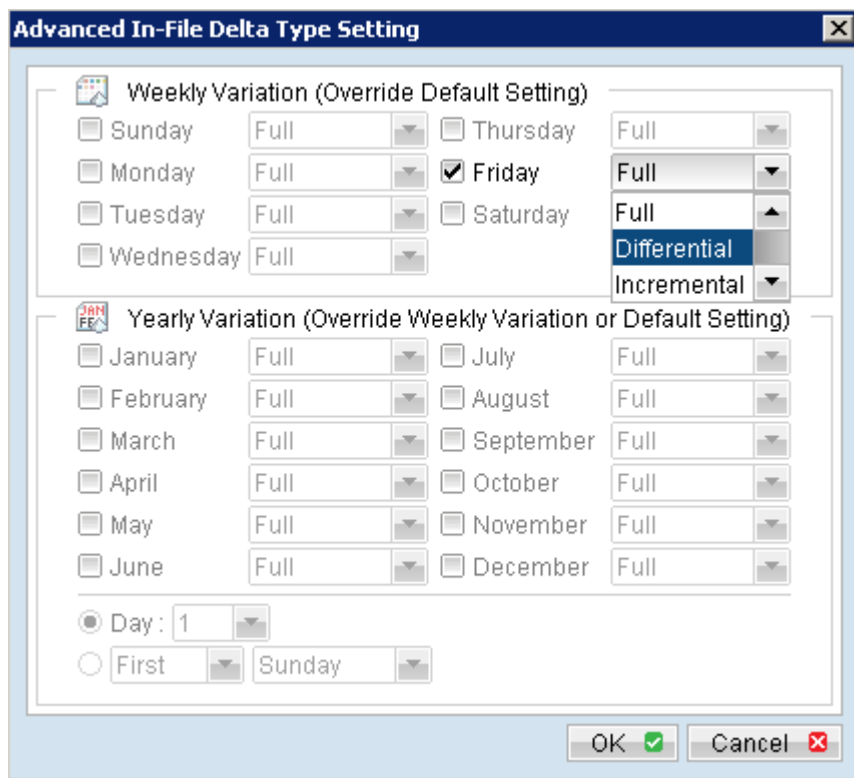


fig. 09 – Differential

In this menu a deviation from the default value can be chosen. Check the box by the "Weekly Variation" day you want to create a differential backup. Friday or Saturday are recommended as differentials can take a bit longer and be a bit larger because they contain more changes than the incremental backup. And since most offices are closed during the weekend the customer is least likely to be bothered by the internet usage.

				[Ratio]
<input type="checkbox"/>	[D] SystemState.bkf	48.43M	2009/09/18 21:03	17.51M [63%]
<input type="checkbox"/>	[I] SystemState.bkf	9.27M	2009/09/17 21:03	3.1M [66%]
<input type="checkbox"/>	[I] SystemState.bkf	10.89M	2009/09/16 21:02	3.74M [65%]
<input type="checkbox"/>	[I] SystemState.bkf	11.17M	2009/09/15 21:02	3.83M [65%]
<input type="checkbox"/>	[I] SystemState.bkf	25.77M	2009/09/14 21:03	8.27M [67%]
<input type="checkbox"/>	[D] SystemState.bkf	47.66M	2009/09/11 21:03	17.13M [64%]
<input type="checkbox"/>	SystemState.bkf	580.65M	2009/07/14 21:03	220.8M [61%]

fig. 10 – Retention short

This overview shows what is stored on the backup server after the settings have been changed. As you can see the chain is clearly shorter ([see fig. 06](#)).

This is the most efficient setting for large files like the Exchange databases or the System State backup.

3. MS Exchange Server Backup

The Pro backup client utilizes since the 6.11.x.x version the Microsoft Volume Shadow Copy Service (VSS) and the Microsoft Exchange Server 2010 Writers to create a database backup. It offers the following types of backup options:

Full backup

Backs up the databases (EDB), transaction logs (LOG), checkpoint files (CHK), and then truncates the transaction logs for a specific database.

If the database being backed up is dismounted during the backup operation, Exchange Server 2010 will not truncate the transaction logs and the result will be the equivalent of a copy backup operation, not a Full backup operation.

Copy backup

Backs up the database (EDB), transaction logs (LOG), and checkpoint files (CHK). Copy backups do not truncate the transaction logs for the database.

However, unlike a Full backup, the transaction log files on disk are not truncated when the backup is complete. Copy backups are not intended for data recovery purposes. Instead, **Copy backups are intended to provide an image of data for use in testing or problem diagnosis.**

Incrementeel backup

Backs up the transaction logs (LOG) to record changes since the last full or incremental backup, and then truncates the transaction logs.

Important: Circular logging must be disabled to use this backup type

Differentieel backup

Backs up the transaction logs (LOG) to record changes since the last full or incremental backup, and does not then truncate the transaction logs.

Important: Circular logging must be disabled to use this backup type

3.1. Database backup

Open the software, go to "Backup Set settings" and click the "+" to add a new backup set.

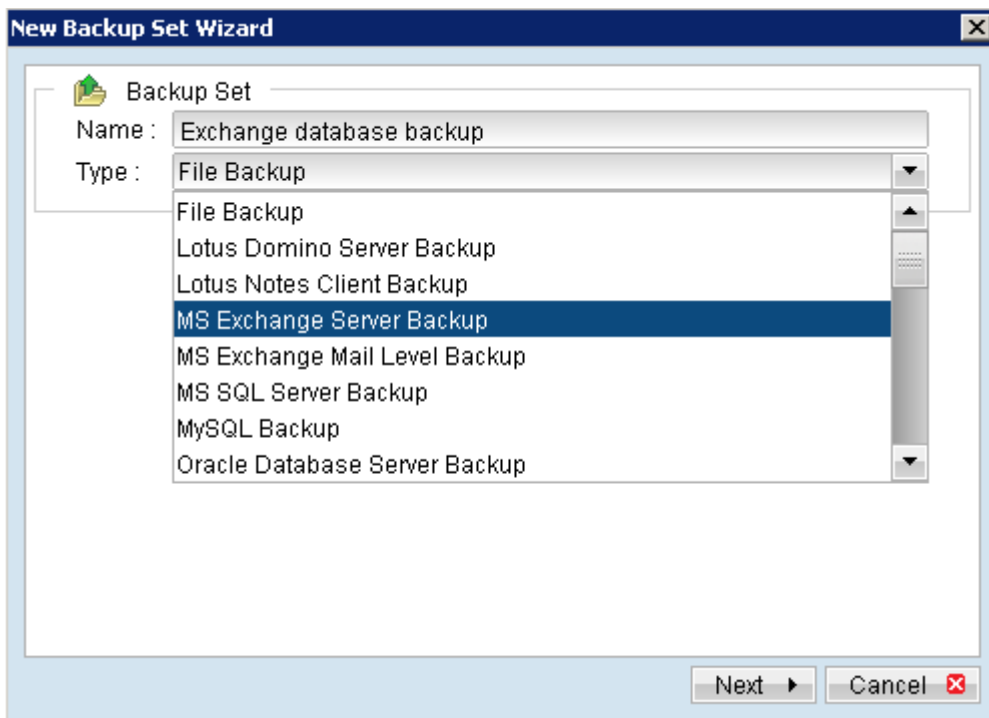


fig. 11 – Exchange backup set

Give the set a clear name like "Exchange Database Backup" and choose the "MS Exchange Server Backup" and click "Next". Select the Exchange Server "Information Store" and the "Public Folder Store" and click "Next".

Choose a backup schedule, by default there are two types. Remove the "Logfile" schedule so only the database schedule remains. Choose the [encryption key](#) and close the wizard.

With these settings a daily backup of the database is created. For most customers this solution works. In case of a calamity the backup of the previous day can be recovered and only 1 days' worth of work is lost at the most. In case the information in the Exchange server is critical we recommend supplementing these settings with a "[Logfile backup](#)".

Tips:

- 2007: The temporarily directory can become 1,5x the size of the largest file in a set, in this case the Exchange databases. A location outside of the System drive (C:) is advised
- Read the chapter "[Efficient Quota usage](#)" to minimize the storage space.

3.2. Logfile backup

The logfile backup option of Exchange is a useful added backup option. The (transaction) logs register every mutation on the database. So these logfiles need to be synchronous with the database. When a logfile is missing or the sequence is incorrect the backup will fail. Because of this we don't recommend using it on smaller Exchange servers.

However when the information on the server is of a critical nature and losing several hours' worth of email is not an option it is a good idea to make logfile backups. In this case the "Circular Logging" feature of Exchange has to be disabled on all Storage Group(s).

- 1) Go to **Start > Programs > Microsoft Exchange > System Manager**
- 2) Expand the **Server** options, open and select the **Storage Group** and then **Properties**.
- 3) In the Properties window uncheck the "Enable Circular Logging" option.
- 4) Click **OK**, and on the confirmation window click: **Yes**
 - To implement the changes a restart of all information store services is required (or a reboot):
- 5) Go to **Start > Programs > Administrative tools > Services**
- 6) In the right pane select **Microsoft Exchange Information Store**, right click, and choose **Restart**. A popup will warn about other services also being restarted. Confirm this.

Ref: <http://support.microsoft.com/kb/314605>

Important: After the circular logging has been disabled a full database backup has to be made prior to the log backups so the logs can sync up to the database.

Now you can add a logfile schedule to the Exchange backup set in the Online Backup Manager software. This is explained in chapter 3.3

3.3. Logfile schedule

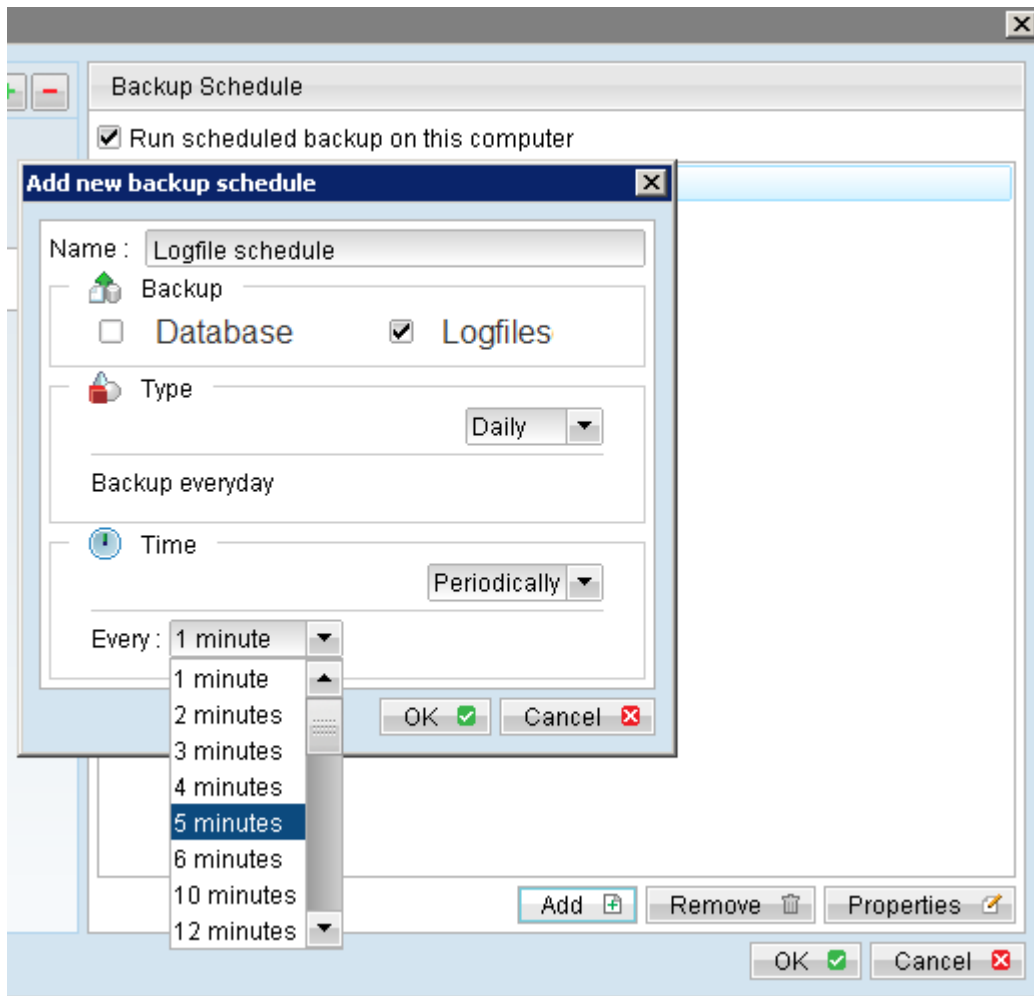


fig. 12 – Log file backup

Add a backup schedule. Supply a clear name like “Logfile schedule”

Choose “Periodically” and an interval e.g. 5 or 10 minutes depending on how critical the email is.

This is the most effective way of using the logfile backup option. This way in case of a crash the server can be recovered to a state 5 or 10 minutes prior to the crash.

Using the default option “Daily” doesn’t add much value to the logfile backup as it only contains the changes (emails) since the last database backup. E.g. a Database backup at 21:00 hours and a logfile backup at 22:00 hours would only contain the emails from 21:00 – 22:00.

Tips:

- Prior to a logfile backup a database backup has to be made. After a database backup logfiles are cleaned up by the software and from then onward they are saved and synchronous with the database. After the logfile backup is completed the old logs will be cleaned up again.
- Look at the chapter [Efficient Quota usage](#) to minimize space used.



4. Exchange Mail Level Backup

In this type of backup all individual items in the users mailbox like: e-mails, calendar items and contacts are backedup. These items can be restored to the Exchange server while it remains available.

The items can only be restored to the original database. **So this backup is NOT a replacement of the database backup but an EXTRA backup.** Only the database contains things like the internal structure, mailbox-id's and user-id's. An new or empty database will have a different structure and the brick level cannot be restored in this.

To read all items in the database the backup user used by the software (Tab: General) has to have administrator rights on all mailboxes. By default read access on the mailboxes is disabled even for the administrator. So a change to these rights is required.

4.1. Adjusting mailbox rights in Exchange

In Exchange 2007 and 2010 the "Full Control" rights can best be adjusted using the "Exchange Management Shell". The following command grants Full access:

```
Get-Mailbox | Add-MailboxPermission -AccessRights FullAccess -user Username
```

This command requests all mailboxes and pipes them through to the Add-MailboxPermission command which add Full Access right to the provided username. It's recommended to use the Administrator.

It might take a while before the altered rights take effect. In a domain with multiple domain controllers it can take up to 15 minutes. On an Exchange server that's also the domain controller the process can be sped up by restarting the "Information Store" service.

The OBM uses the Microsoft MAPI client to access the mailbox items. This client is not installed by default on Windows 2008/2012.

Download and install the "Microsoft Exchange MAPI Client and Collaboration Data Objects 1.2.1" or higher from the Microsoft website: [ExchangeMAPICdo.exe](#)

The MAPI client is only available as a 32-bit program, to communicate with this it is necessary to start the OBM software in 32-bit mode. The scheduled backup automatically start the Mail-level-backup in 32-bit mode in the background. But to create or edit the set we have to start the software in 32-bit mode using the following method.

```
%PROGRAMFILES%\Mindtime Pro Backup\bin\RunOBC32.Bat
```

If you're users come and go and the settings have to be altered often it might be a good idea to create a shortcut on the desktop to the above file.

A new command prompt window will open and then the OBM main window. The set can now be created or edited.

- Go to "Settings" (cog) and click "+" for a new set.
- Choose a good name for the set like "Mail-Level-Backup", and choose "MS Exchange Mail Level" as the type. Click on Next.
- Select the mailboxes you want backed up and the public folders, or the root of the mailbox folder (selecting the root means every new mailbox is included in the backup but this might result in over Quota messages when new mailboxes are created faster than that they are bought). Click next.
- Choose a backup schedule and click next.
- Choose your [encryption key](#) and click OK.

The set is now created. Click the "General" pane and fill out the users credentials that have access to the mailbox backup (usually Administrator).

Close all windows by clicking OK.

You can test the settings by manually starting a backup set and interrupting it.

5. Mail Level Backup problem solving.

5.1. Unable to create the set: insufficient permissions to the mailbox.

- Check if the current user has the “Full Control” rights to all mailboxes.
- Check if the current user has an active mailbox
Ref: <http://support.microsoft.com/kb/275636/en-us>
- The current user has to be visible in the Global Address List.
- In case that the above suggestions do not solve the problem: check the MAPI profile:
 1. Download the MAPI editor ([MfcMapi.exe](#)), the 32-bit version.
 2. Open the MAPI editor
 3. Menu “Profile”, “Show Profile”

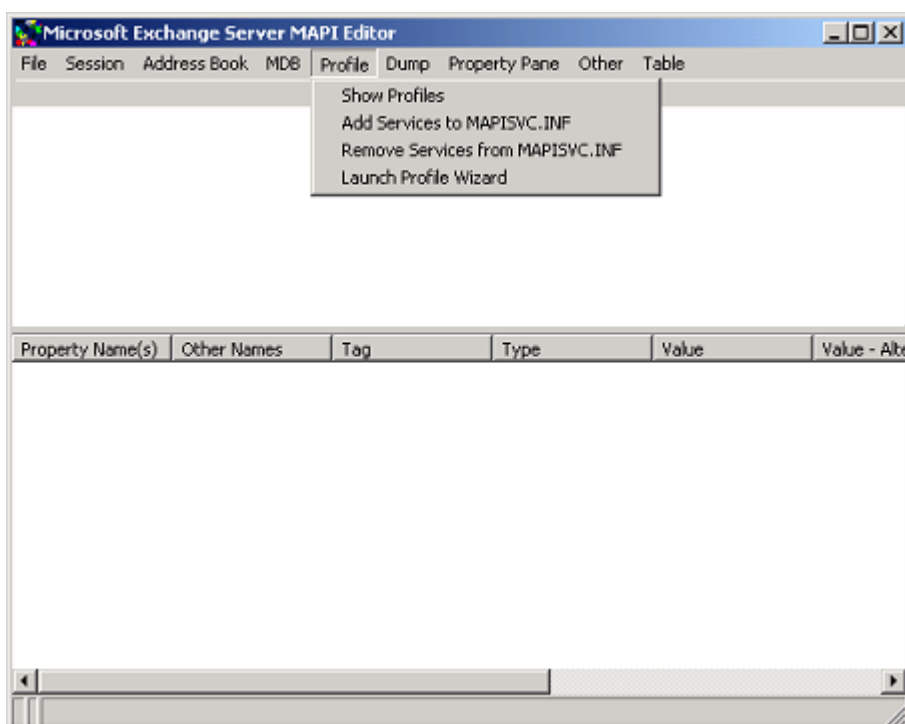


fig. 13 – MAPI Profile

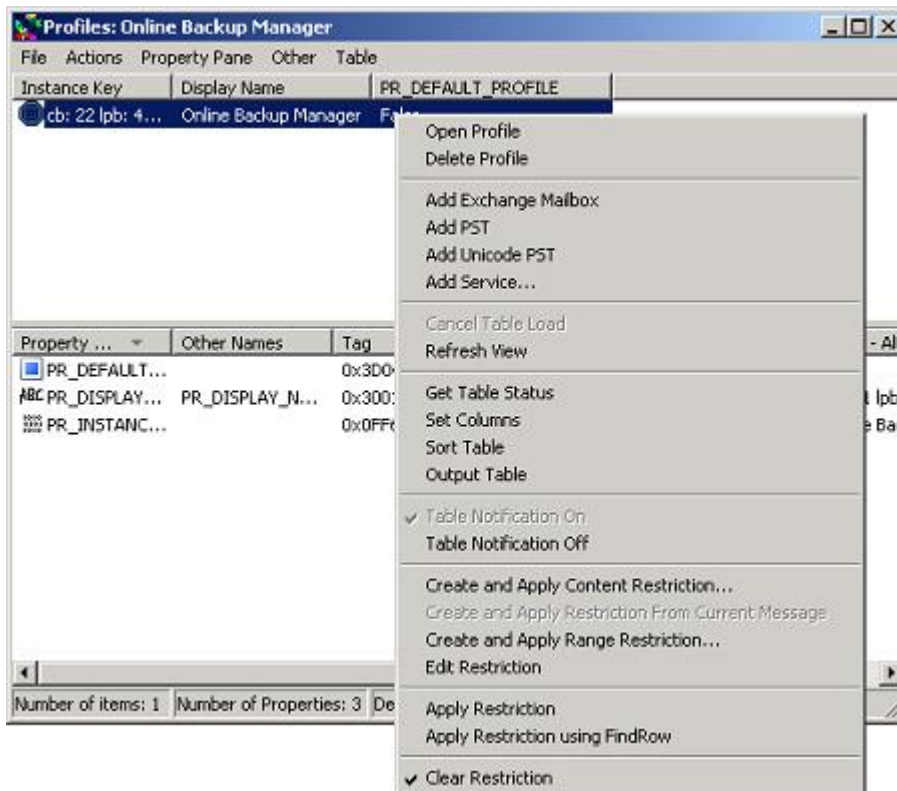


fig. 14 – Profile manager

4. Right click the **Online Backup Manager** profile
5. Choose **Open Profile**

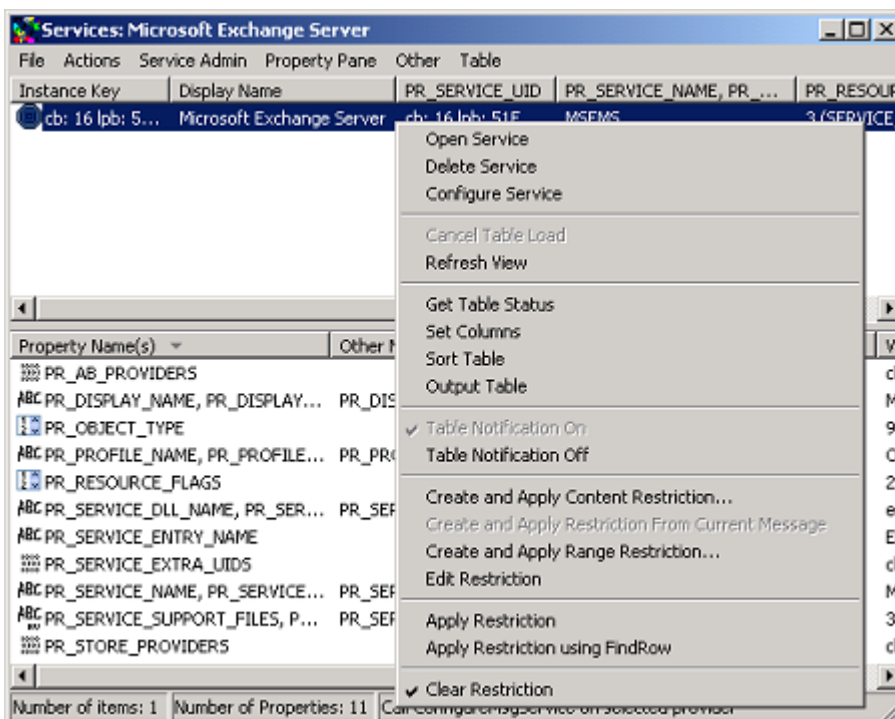


fig. 15 – Open Profile

6. Right click on **"Microsoft Exchange Server"** and choose **"Configure Service"**:

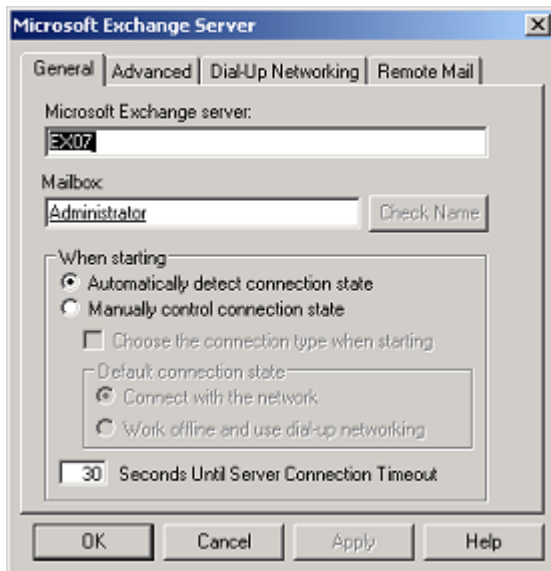


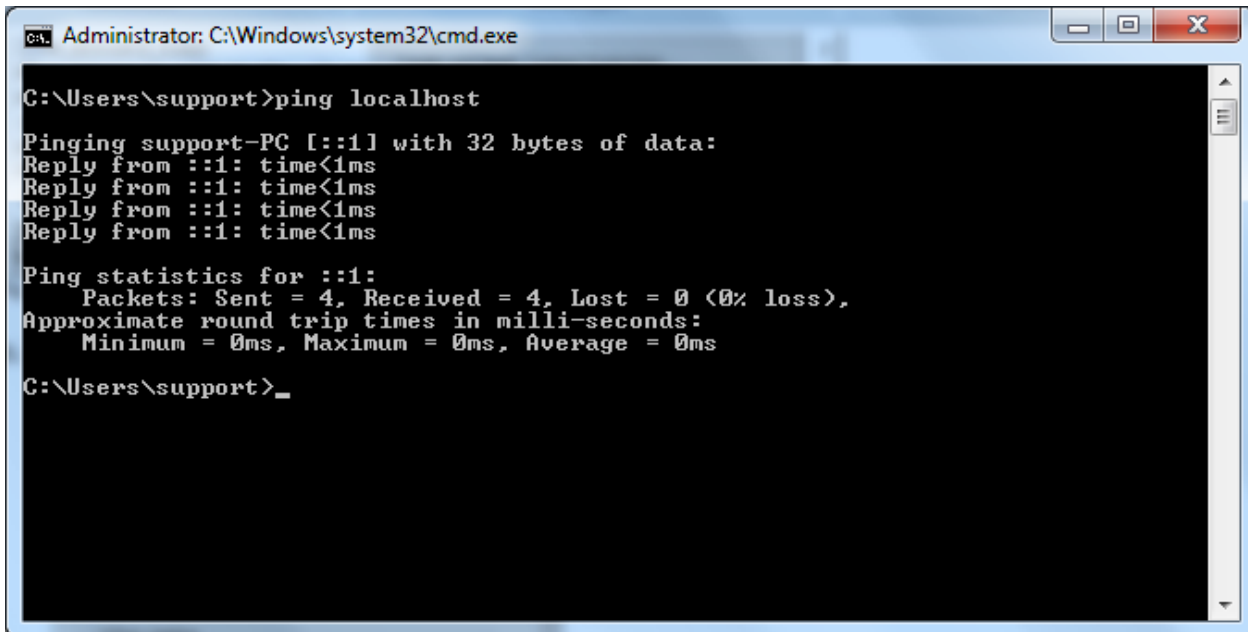
fig. 16 – Configure service

7. Supply the **Servername** and the **Mailbox** and click **Check Name** for verification, and then click **Apply**:
8. E.g. servername: 'localhost' and mailboxname 'administrator', 'localhost' will then change to the Exchange server hostname.
9. After this is completed, restart the OBM software.

5.2 Administrator might have insufficient permissions to the mailbox

The bricklevel backup requires the IPv4 protocol by default. The OBM software and the MAPI client connect with each other using the IPv4 and an answer in IPv6 will result in an error.

To test this you can `ping localhost` in a command prompt



```
Administrator: C:\Windows\system32\cmd.exe

C:\Users\support>ping localhost

Pinging support-PC [::1] with 32 bytes of data:
Reply from ::1: time<1ms
Reply from ::1: time<1ms
Reply from ::1: time<1ms
Reply from ::1: time<1ms

Ping statistics for ::1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\support>_
```

Fig.17 - Ping localhost

If the answer to the ping is in IPv6 like in fig. 18 the default protocol will have to be changed to IPv4.

The following steps completely disable IPv6. If you still want to use the IPv6 protocol you have to use a different method which just changes the default protocol to IPv4.

Ref: <http://support.microsoft.com/kb/929852>

Warning: Only continue if you've worked with regedit.exe before. Making a mistake here might damage your computer/server!

1. Start, Run and execute regedit.exe.
2. Surf to the key:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip6\Parameters\
3. Create a new DWORD(32-bit) variable with the name DisabledComponents
4. Give this variable the value FFFFFFFF
5. Check your changes and close the editor.
6. Restart the computer to activate the changes

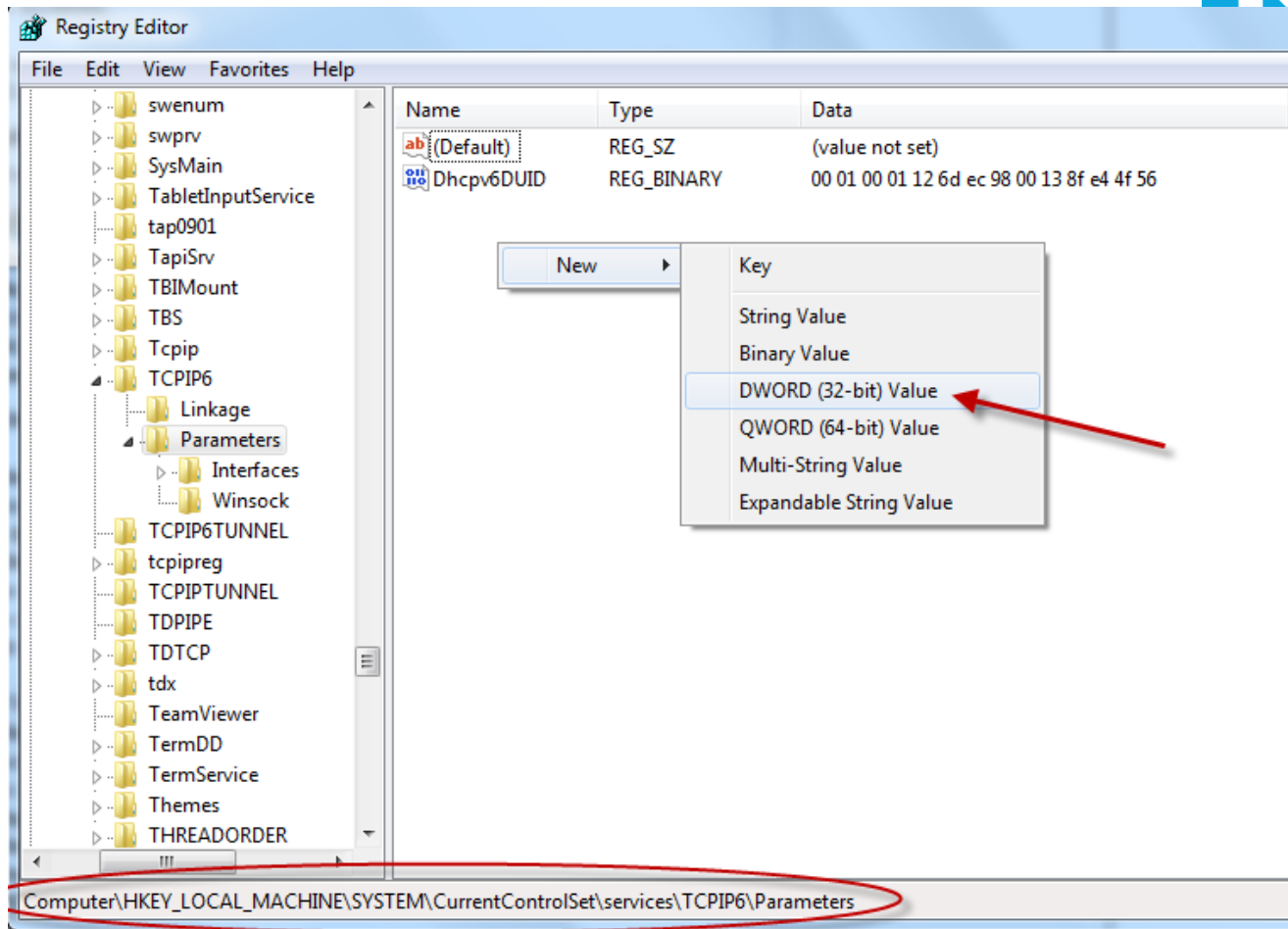
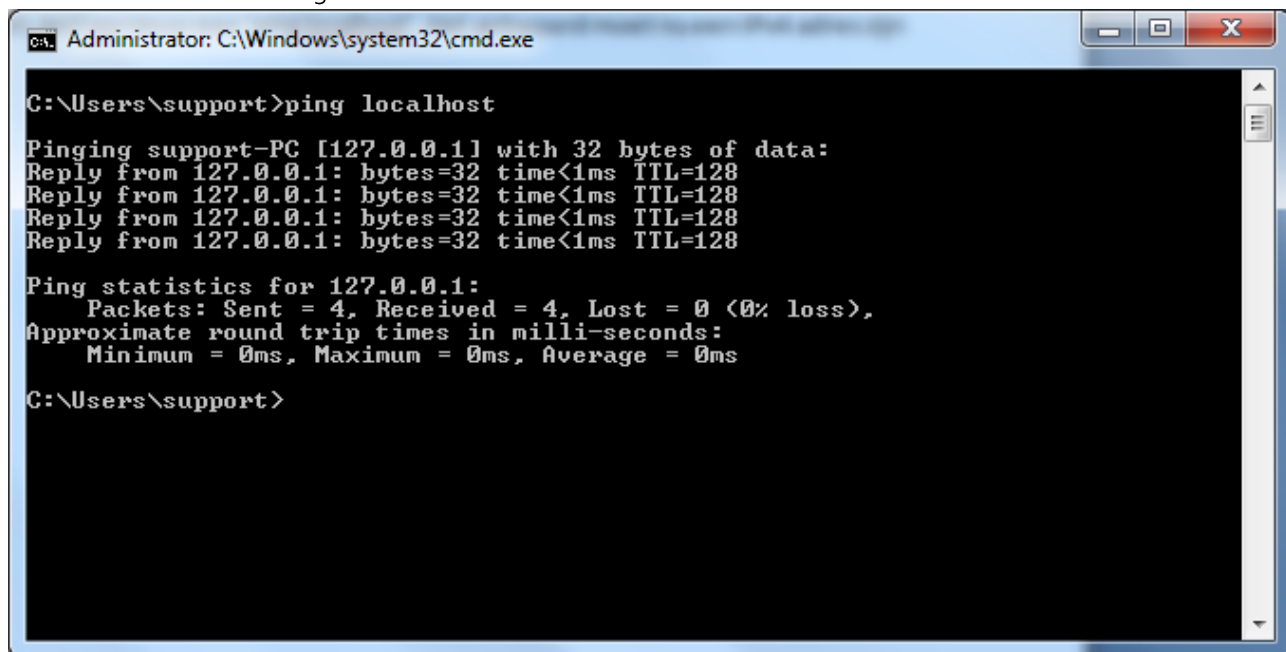


fig. 18 – Regedit.exe

After the machine has restarted test again using the `ping localhost` command. The answer should be a IPv4 address this time like in fig. 20.



```

Administrator: C:\Windows\system32\cmd.exe

C:\Users\support>ping localhost

Pinging support-PC [127.0.0.1] with 32 bytes of data:
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128

Ping statistics for 127.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\support>
  
```

Fig. 19 – Ipv4 response

5.3. Mailbox access rights

Check if full access has been granted to the backup account.

Try re-running the command from [Chapter 4.1](#) if errors are shown the access rights are set.

5.4. Did you assign the system account for backup to the correct security group?

The account must be a member of the following security groups:

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

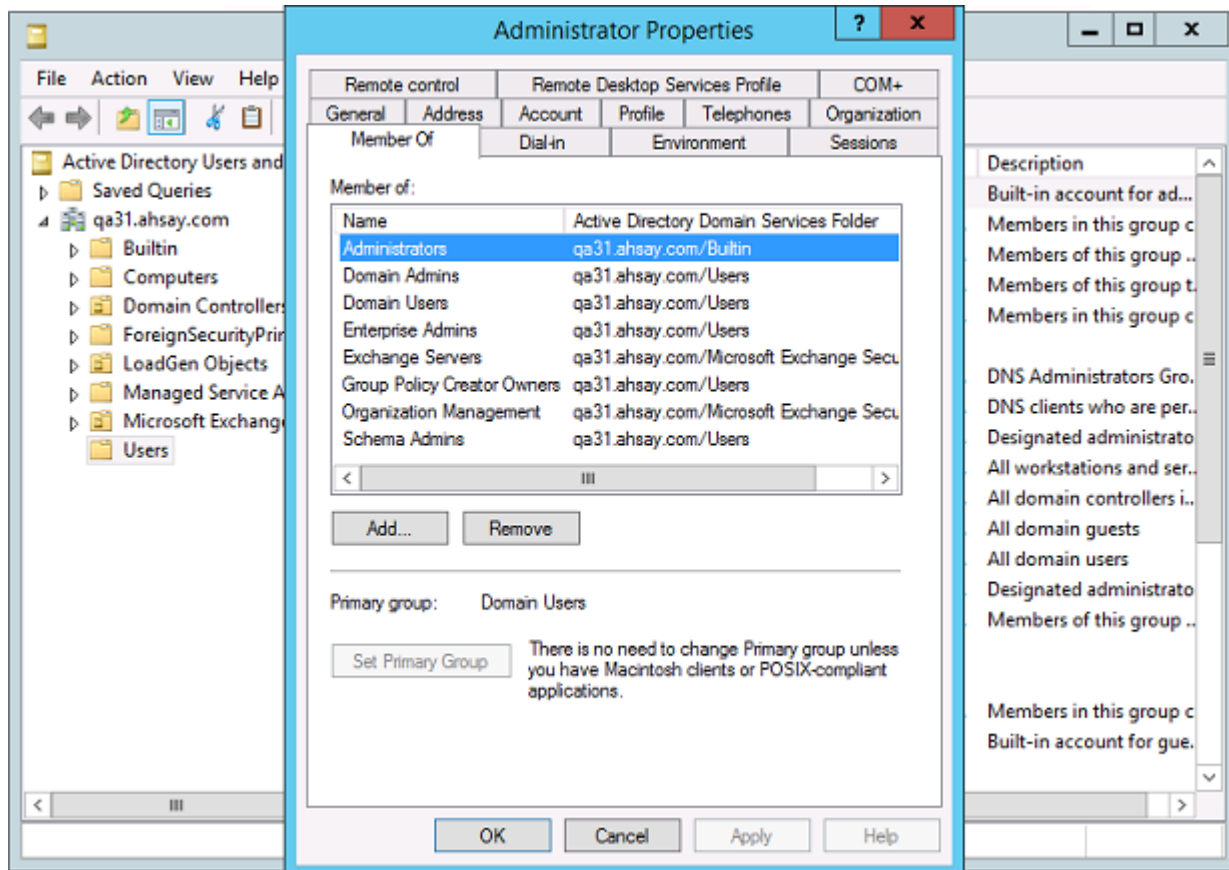


fig. 20 – Security groups

To check on the current settings:

1. Click [Start], point to [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].
4. Select the [Member Of] tab to check on the membership setting.

5.5. Remote shell enabled

Is the Remote Exchange Management Shell enabled for account for backup?

To check on the settings:

1. Click [Start], point to [Microsoft Exchange Server], then click [Exchange Management Shell].
2. Enter the following command:

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

3. Reboot the Exchange server afterward.

5.6. LAN Manager authentication level

Wat is het LAN manager authenticatie niveau voor de Exchange server?

To check on the setting:

1. Click [Start], [Control Panel], [Administrative Tools], and then click [Local Security Policy].

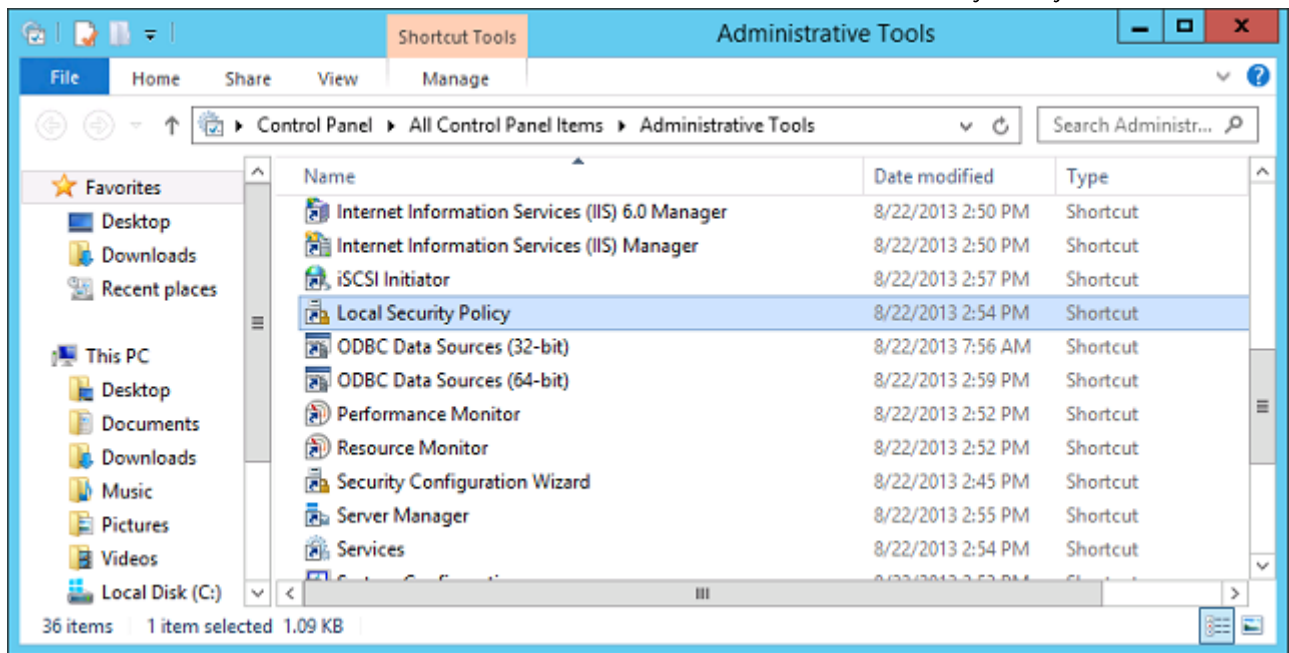


fig. 21 – Local security Policy

2. Under [Security Settings], expand [Local Policies], [Security Options], [Network security: LAN Manager authentication level].
3. Ensure that the setting is configured to use NTLMv2, for example:
4. Send NTLMv2 response only
5. Send NTLMv2 response only. Refuse LM
6. Send NTLMv2 response only. Refuse LM & NTLM

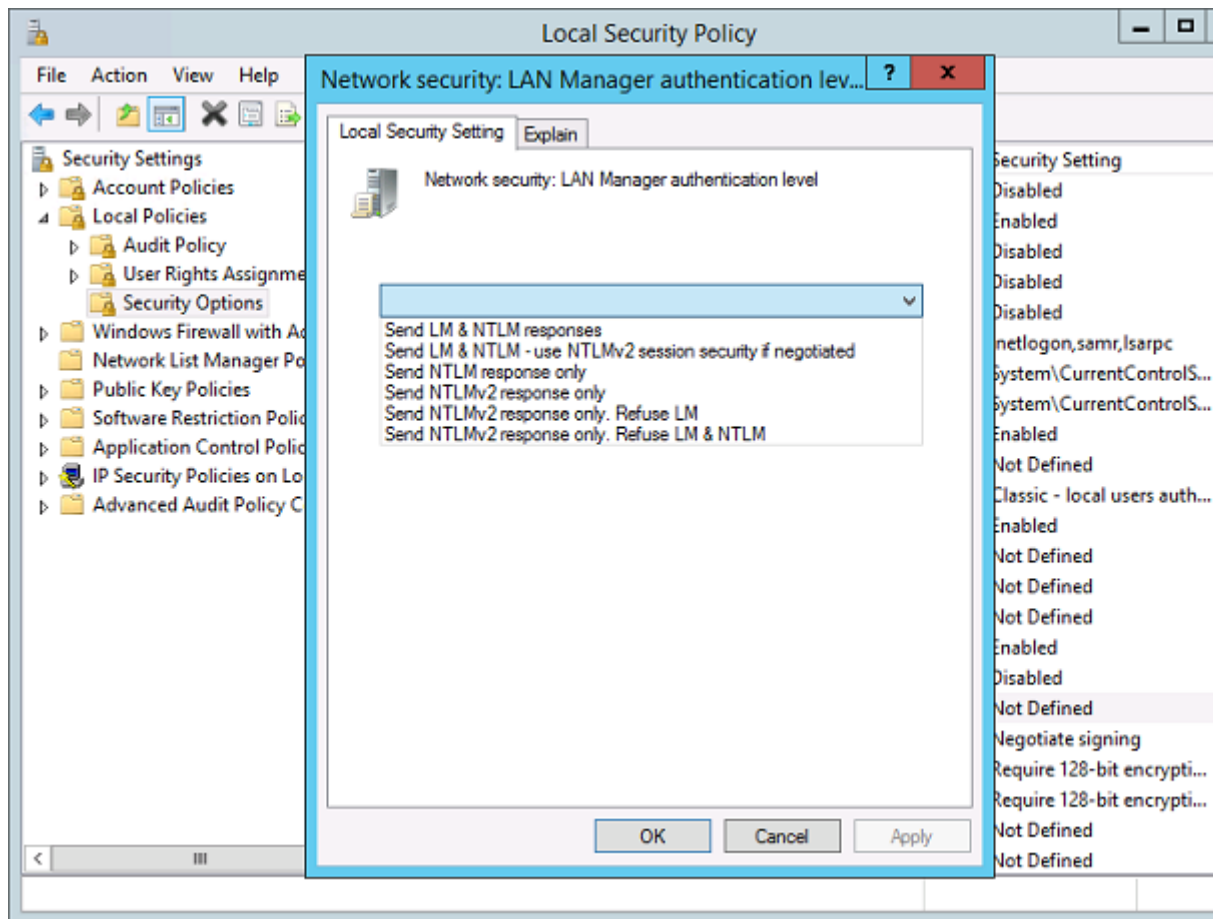


fig. 22 – NTLMv2

5.7. .NET Framework 3.5 Features

Is the .NET Framework 3.5 Features installed?

To install the feature:

1. In [Server Manager], click [Manage] and 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, check the box next to [.Net Framework 3.5 Features].

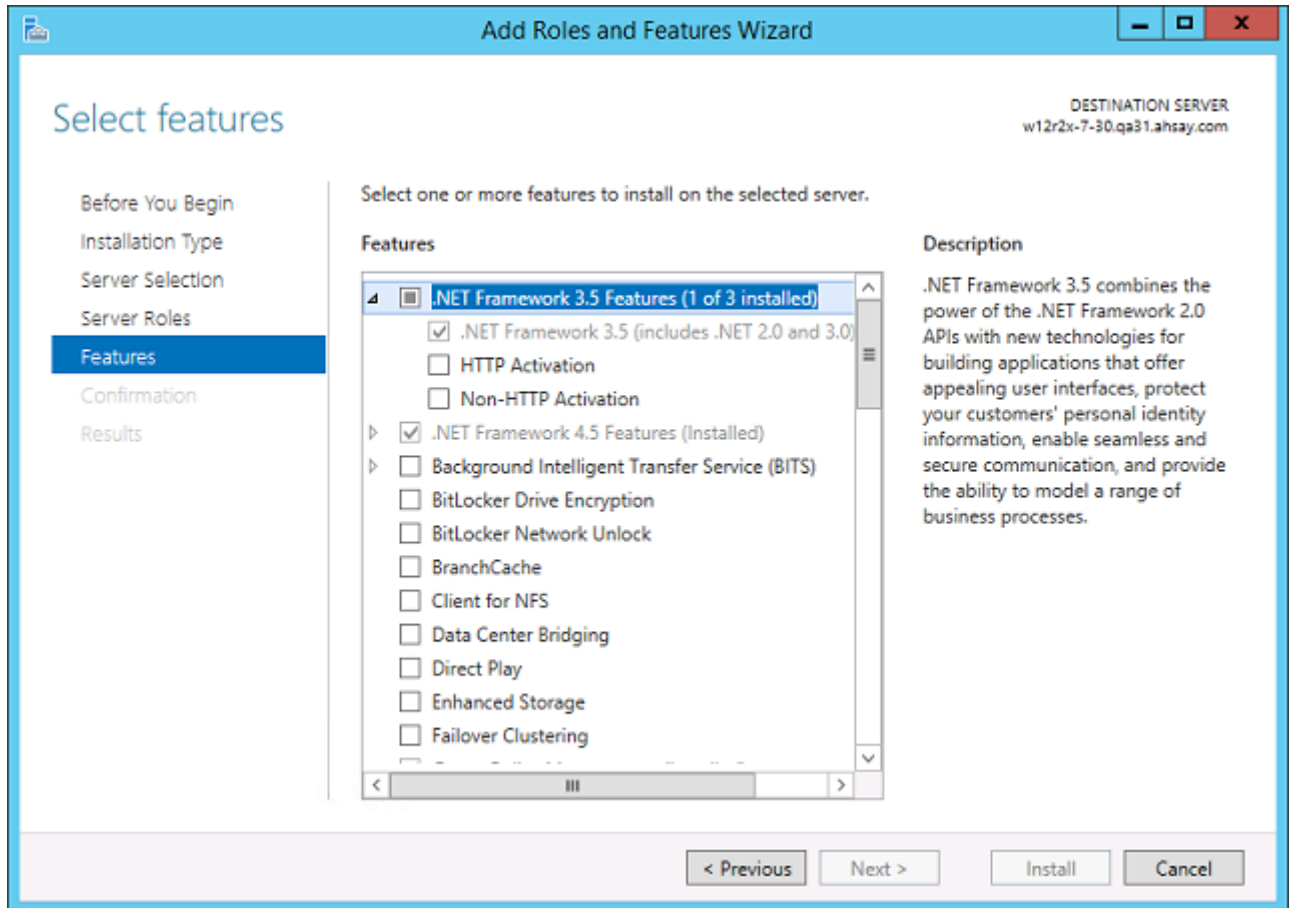


fig. 23 – .NET 3.5 features

5.8. Windows PowerShell 2.0 Engine

Is Windows PowerShell 2.0 Engine installed?

To install the feature:

1. In [Server Manager], click [Manage] and 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, check the box next to [Windows PowerShell 2.0 Engine].

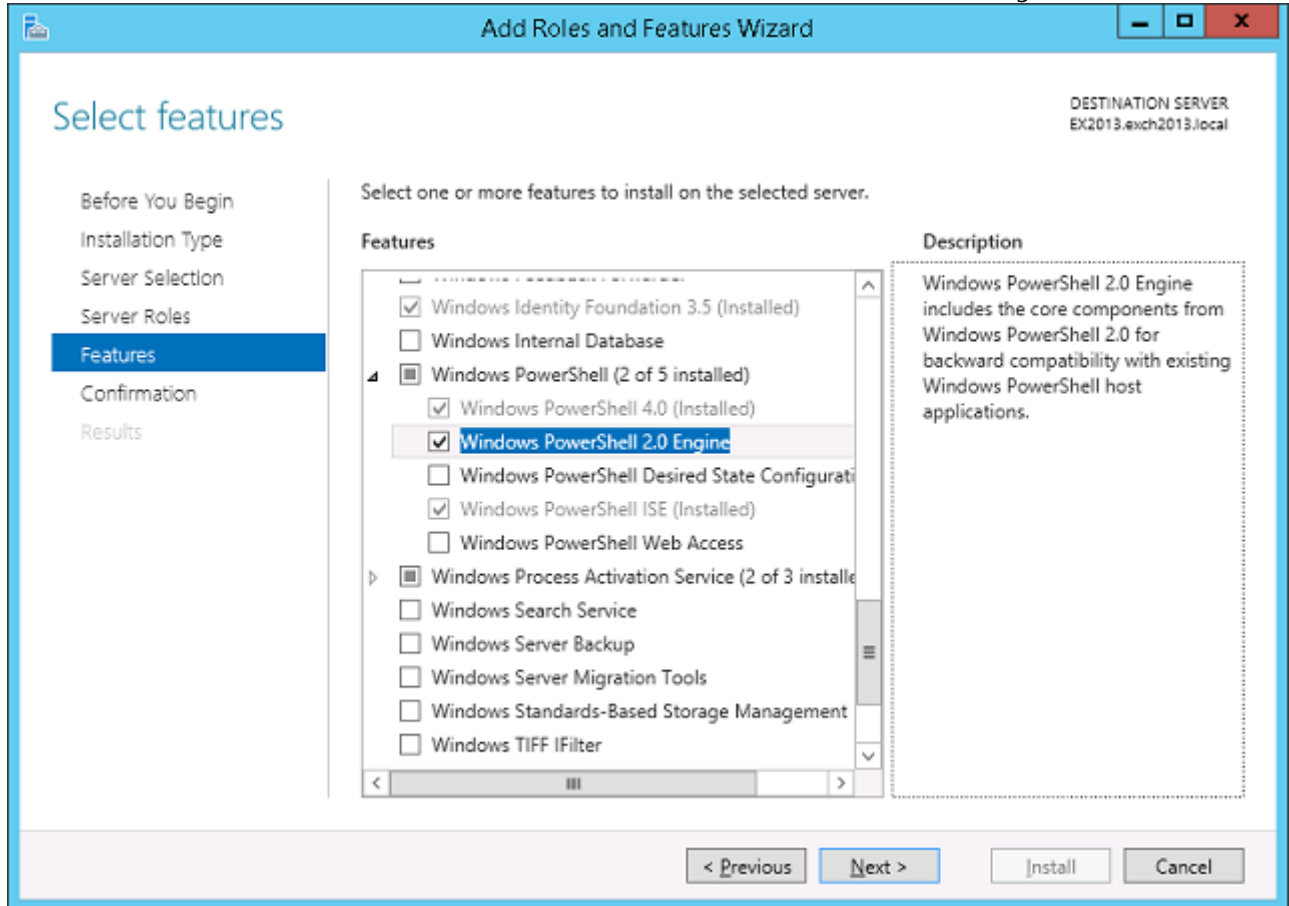


fig. 24 – Powershell