How to recover your Exchange 2003/2007 mailboxes and emails if all you have available are your PRIV1.EDB and PRIV1.STM Information Store database

How this document came about

Hmmm. Have you heard of the company on the floor below, a small but very successful business, with no backup procedures of any sort? Yes, that one, the company which only two months before had to recover from a serious server crash and saw Dell give them the run-around for four weeks. And, despite that, still no backup tape drive on their replacement server. Nada, Rien, None, Niet, Zilch!

Would you believe it – they suffered another server crash within a week of getting a new server!! Talk about being jinxed. We were drafted in. They were lucky. The server hard disk had only failed in the boot area of the hard disk so we were able to retrieve their files without problem, and we were also able to recover the whole MDBDATA Exchange folder which contained their Exchange email database (PRIV1.EDB, PRIV1.STM, PUB1.EDB, PUB1.STM).

We built them yet another server, restored the data files, and then turned our attention to restoring their Exchange emails.

This is where we got stuck – we install backup tape drives on all our clients’ servers, and we insist on a thorough tape rotation schedule; this means there is always a backup to restore from (we use Symantec Backup Exec), so this was a unique situation for us. We had never attempted to restore an Exchange Information Store (IS) from the EDB and STM files, and we didn’t know how to. Like everyone else we scoured the net for a solution – Nothing! Well, at least nothing intelligible, nothing easy to follow, and, above all, nothing which said “It is definitely possible”. We were shocked: there were hundreds and hundreds of stories of people in the same situation and no solution. Funny – we thought Microsoft Exchange was nowadays the most used corporate email system .... So we had to work it out for ourselves and evolved the unique solution below.

The principle behind our “Exchange Restore” solution

After trying various approaches, to no avail, we simply observed how backup software goes about restoring a Microsoft Exchange Information Store and ...... mimicked it!
This document’s assumptions

The solution detailed below assumes that you are attempting to restore a Microsoft Exchange email database from a single site (single server). The Exchange EDB and STM files can be from a Small Business 2003 Server or a full Exchange 2003 Server or Exchange 2007 Server; the solution will work in either case. What must be, however, is that the Exchange Information Store (IS) database you are trying to recover is from the one single site.

Note: our real-life case involved a Small Business Server 2003 R2. However, we subsequently tried the solution on a full Exchange 2003 and it worked – we restored the mailboxes without problems. Although we have not tried it on SBS2000, Exchange 2000, or Exchange 2007, we believe it will also work with both Exchange 2000 and Exchange 2007.

Another assumption of this document is that you have a minimum working knowledge of DOS.

Lastly, the repair commands detailed in this document only ever mention EDB files. This is because those Exchange commands automatically include the corresponding STM file in their operations.

What you will need

Before you start make sure you are able to check every one of the boxes below:

- **A fully updated Windows 2003 / SBS2003 server.** You absolutely must make sure that the server you want to restore your Exchange IS database onto has all the latest Windows updates, every one of them. Some Windows patches actually address Windows compatibility issues with Exchange 2003, so do not skip this step.

- **A fully updated Exchange 2003 server.** At the time of writing of this document Exchange 2003 is on Service Pack 2, so make sure you install Service Pack 2 even if your original server only had Service Pack 1. Then, install all post-SP2 updates to Exchange 2003, every single one of them. The reason for this is that you will run into intractable problems if you attempt to recover your Exchange mailboxes on a server which was not as up-to-date with Windows patches as the original and now defunct server. The reverse, on the other hand, where your new server has more up-to-date Windows updates than the original server, is not a problem: Exchange will restore.
Exchange 2003 configured above the default 18GB database size limit.

By default Exchange 2003 comes configured with a database size limit of 18GB (for Exchange 2000 it is 16GB). Since Service Pack 2 this limit has been raised to 75GB but Exchange 2003 still installs with an 18GB database limit. What this means is that if you attempt the Exchange Recovery outlined in this document with an Exchange database which has a size larger than 18GB, it won't work unless you perform this step. Even if the Exchange Information Store you are trying to restore is a lot less than 18GB, it is still a good idea to perform this step to future proof your new Exchange installation. To increase your new Exchange database size limit above 18GB, go to the Microsoft Knowledgebase and search for article KB912375.

Server Name + Domain Name of the old server. This is absolutely vital as you must configure your recovery server with the same Server name and the same Domain Name (both in terms of the Active Directory name and the NETBIOS name). If you have already set up your new server and you used a different server name from the original server, or if the new server is also a domain controller (as in Small Business Server) but you did not give it the same Active Directory Domain Name and/or you did not give it the same NETBIOS Domain Name, then start everything again.

If you are not in possession of the Server Name of the old server, or if you do not know the Domain Name that was being used, then get an old email that was sent from the old server! For example, the owner of the company will most probably have sent himself emails to his/her home email address. Once you can access such email, look at the routing information of the email (also called Mail Header or Email Envelope) – that routing information will in most cases reveal what the old Domain Name was and, often, the name of the server too. If the routing information does not give you the server name, then simply fire up one of the PCs that used to be connected to the old server and look at the network drive mappings in Windows Explorer – they will tell you the name of the server that the PC is expecting to connect to through those mappings.

Lastly, your Exchange server may not be a domain controller and may simply be a member server. Our advice still applies: make sure the Exchange server has the same name as the old server, and that the Domain that it is a member of, also has the same name as the old Domain.

Ensuring that the Server and Domain names are identical to the old environment simplifies the Exchange recovery process so much it really is worth restarting from scratch if you did not configure your recovery server as per these recommendations.
PRIV1.EDB and PRIV1.STM at least. The ideal scenario is one where you have been able to recover the entire MDBDATA Exchange folder which contains your “First Storage Group \ Mailbox Store” (PRIV1.EDB & PRIV1.STM) and your Public Folders Store (PUB1.EDB & PUB1.STM). If you did not configure the original server which died or whose hard disk crashed, remember that the original location of MDBDATA may have been moved from its original “C:\Program Files\exchsrvr” location on the original server. This is a common practice which allows the system configurator to dedicate a partition or hard disk solely to Exchange. Consequently make sure you have recovered every MDBDATA folder that you can find on the stricken server. Do not remove the .LOG files from the MDBDATA folder(s) you recover – recover the entire folder(s).

Change the location of the Exchange Information Store. Since you are on a new server it is good practice to change the location of the Exchange Information Store from its default of C:\Program Files\Exchsrvr\MDBDATA. Aside from this being good organization, the fact is that when a server suffers a hard disk crash, the most affected partition is usually, by a long way, the SYSTEM partition (the C: drive) rather than any other partition, so it is good practice not to leave your Exchange databases in their default location on the C: drive. If you have a single hard disk server, create a partition dedicated to Exchange – if you have two hard disks, dedicate the second disk to Exchange only. To change the location of the Information Store, do as follows:

- Open Exchange System Manager
- Drill down to Servers
- Find your server
- Right-click on First Storage Group
- Choose Properties
- Change both the Transaction Log location and System Path location to the MDBDATA folder on the dedicated Exchange partition or hard disk.
- Drill further down to the Mailbox Store
- Right-click on the Mailbox Store and choose Properties
- Go to the Database tab
- Change both the Exchange Database and Exchange Streaming Database locations to the MDBDATA folder on the dedicated Exchange partition or hard disk
- Next, right-click on the Public Store and choose Properties
- Go to the Database tab
- Change both the Exchange Database and Exchange Streaming Database locations to the MDBDATA folder on the dedicated Exchange partition or hard disk

Remove all Storage Limits. One of the classic problems following the restore of an Exchange database is the inability to receive or send emails caused by the default Exchange storage limits being stricter than those of the previous server. This step is important in avoiding the problem. To do this drill down to both the Mailbox Store and the Public Store but this time go to the Limits tabs and clear all limits.
Performing the Exchange Recovery

**Safeguards, Safeguards, Safeguards – Have a way back !**

- **Backup the MDBDATA folder which you recovered**, onto a different folder. This way, if things do not go as planned, you can start again with the originals of the recovered Exchange Information Store. Never ever use the backup for anything other than copying it to the folder that you are working in. It is called a backup and should stay as exactly that: a backup.

- **Hard disks fail.** More importantly, even a new hard disk can fail on you within hours or days of using it for the first time. It would be bad luck but it happens – remember the beginning of this story: the company in question had a server that was barely a week old. Thus, make sure the recovered MDBDATA is also backed up to an external source, like a USB hard disk, another server, or a tape drive.

**Get the new server ready**

- **Create your users on your new server** (and make sure they have Exchange mailboxes).

- **Make sure no-one can connect to your new server.** The best way to do this is to have your server’s network card(s) plugged into a mini-hub which itself goes nowhere (ie. nothing else is connected to that hub).

- **Disable your Exchange’s SMTP Virtual Server.** This prevents emails being delivered to Exchange mailboxes or being sent from Exchange while you are performing the recovery of your old Exchange Email Database. To do this, do as follows:
  - Open Exchange System Manager.
  - Drill down to **Servers**.
  - Find your server.
  - Drill down to **Protocols**.
  - Drill down to **SMTP**.
  - Right-click on the default **SMTP Virtual Server**.
  - Choose **STOP**.

- **Dismount the existing Mailbox Store & Public Folder Store.** To do this, do as follows:
  - Open Exchange System Manager.
  - Drill down to **Servers**.
  - Find your server.
  - Open First Storage Group.
  - Right-click Mailbox Store and choose **Dismount Store**.
  - Repeat the procedure for the Public Folder Store.
Eliminating corruption problems in the recovered Exchange IS database

- Put the recovered MDBDATA folder in a temporary work folder. Let's assume this work folder is called C:\Recovery.

- Open a Command Prompt (MS-DOS Prompt) box and make your way to the recovered MDBDATA folder (remember – you must have already made a backup copy of this recovered email database before you reach this point).

- Using your mouse enlarge the Command Prompt box so you can see a lot of lines at the same time.

- Type the command below – it will check the consistency of your recovered Exchange database:
  
  "C:\Program Files\Exchsrvr\bin\ESEUTIL" /mh PRIV1.EDB

- Repeat the procedure for the Public Folders store:
  
  "C:\Program Files\Exchsrvr\bin\ESEUTIL" /mh PUB1.EDB

- For both mail stores scroll up the display and look for the line which starts with "State". If there are no errors then go straight to the "Restoring the Exchange Mailboxes and Emails" section below. If there are errors, continue below.

- Since there are errors the next step is to bring your databases into a consistent state. To do this run the following command which performs what is called a "soft recovery" where the ESEUTIL.EXE Exchange utility attempts to apply the Exchange .LOG log files onto your Exchange database – this commits to the Mailbox store any emails that had not yet been committed to it before the old server crashed:
  
  "C:\Program Files\Exchsrvr\bin\ESEUTIL" /r E00

  Click Yes to proceed with the repair.

- If there are no errors then go straight to the "Restoring the Exchange Mailboxes and Emails" section below. If there are errors, continue below.

- Since the Soft Recovery did not work the next step is to force your recovered PRIV1.EDB and PUB1.EDB into a consistent state (no errors in the databases) which will allow you import the recovered databases into your new Exchange server. This does mean that you may lose a few emails that had not yet been committed but that is an insignificant issue compared to the bigger prize of being able to get 99.5% of your emails back.
Let's now perform a **Hard Recovery**. Type the following command at the Command Prompt:

```
“C:\Program Files\Exchsrvr\bin\ESEUTIL” /p PRIV1.EDB
```

Click **Yes** to proceed with the repair. This process will take anything from 5 to 10 minutes to an hour or more depending on the power of your new fileserver and the size of your recovered Exchange Information Store.

Repeat the process with your Public Folders:

```
“C:\Program Files\Exchsrvr\bin\ESEUTIL” /p PUB1.EDB
```

If your Public Store was empty you will receive some errors where they only way to get rid of the error is to forcibly terminate your Command Prompt window using the Task Manager. If you need to, do so.

At the end of **Hard Recovery** on PRIV1.EDB you will receive an **Integrity Check Successful** message. And you may receive a similar “Success” message for PUB1.EDB, or you may not, as described above.

Proceed to the next section.

**Restoring the Exchange Mailboxes and Emails**

Tell Exchange to allow you to overwrite the current empty mailboxes. To do this, do as follows:

- Open **Exchange System Manager**.
- Drill down to **Servers**.
- Find your server.
- Open **First Storage Group**.
- Right-click **Mailbox Store** and choose **Properties**.
- Go to the **Database** tab.
- Check **This database can be overwritten by a restore**.
- Click **OK**.
- If your Public Folders, PUB1.EDB, passed the **Soft Recovery** or **Hard Recovery** above, then repeat this procedure with the **Public Folder Store**.
- Check that both your **Mailbox Store** and your **Public Folder Store** are still in a **Dismounted** state. If they are not, dismount them again.

Using Windows Explorer go to the Exchange databases folder of your new Exchange Server. Typically that will be:

*C:\Program Files\Exchsrvr\MDBDATA*
Create a **Backups** folder inside this LIVE MDBDATA folder and move all of the following files from MDBDATA into it:
- All log files (.LOG).
- PRIV1.EDB and PRIV1.STM.
- If, and only if, you did not get any errors with PUB1.EDB above, then also move PUB1.EDB and PUB1.STM.
- Any files starting with **TMP** or **TEMP**.

Now, move to the Live MDBDATA folder, the fixed Exchange database files (the one is **C:\Recovery**). Move PRIV1.EDB and PRIV1.STM.
If PUB1.EDB and PUB1.STM are already in your Live MDBDATA folder (because you are keeping the empty ones created by your new Exchange Server), then do **NOT** move them from C:\Recovery. If they are not already in your Live MDBDATA folder, then do move them.

Next, start **Exchange System Manager** and mount your **Mailbox Store** and the **Public Folder Store**. To do this, do as follows:
- Open **Exchange System Manager**.
- Drill down to **Servers**
- Find your server.
- Open **First Storage Group**.
- Right-click **Mailbox Store** and choose **Mount Store**.
- Repeat the procedure for the **Public Folder Store**.
They should both mount successfully!

Immediately run **Cleanup** on your Mailbox Store. To do this, do as follows:
- Open **Exchange System Manager**.
- Drill down to **Servers**
- Find your server.
- Open **First Storage Group**.
- Open **Mailbox Store**.
- Highlight **Mailboxes**.
- Right-click **Mailboxes** and choose **Run Cleanup Agent**.

As soon as you run the **Cleanup Agent** all the mailboxes that you just imported will show as disabled with a **red cross** to the left side of each imported mailbox. You’re winning! You can also satisfy yourself that your mailboxes and emails have indeed been restored by checking the **Size** and **Total Items** columns in the right pane.
Keep **Exchange System Manager** open and positioned on **Mailboxes**.
Match Users to their old Mailboxes. For each user set up on your server, do the following:

- Open Active Directory Users and Computers (ADUC)
- Right-click the user and choose Exchange Tasks.
- Click NEXT and then choose Delete Mailbox on the next screen
- Click NEXT, and NEXT again.
- ADUC will come back telling you that the mailbox deletion was successful
- Click FINISH.
- Switch over to Exchange System Manager
- Right-click Mailboxes and choose Run Cleanup Agent
- Next, right-click the old restored mailbox that you want to associate with this user (that's the one with items in it), and choose Reconnect
- A dialog box opens called “Select a new user for this mailbox”
- Find the user in Active Directory, select it, and click OK
- Exchange System Manager will respond indicating a successful reconnection. What this means is that, at this point, this user has now got his old mailbox back (ie. it is now fully recovered and restored onto the new server).

Repeat this process for every user.

Cleaning up

So, you have finally successfully recovered your Exchange Mailboxes and Emails. Life is sweet, you turn on the Radio or your MP3 player, you’re whistling and singing, you do a cartwheel or two, you order a pizza (you’ve been at it for 96 hours!), you phone the company’s owner to bring him/her the good news, you phone home for a bit of a chat, you ask to talk to the dog, the dog thinks you’re barking mad, you play a round of golf on your Wii, you get 6 cans of Coke from the vending machine (you couldn’t drink while you had your heart in your mouth!), and, basically, you become a nice pleasant person again ….

Well done!

Now for a bit of cleaning up:

At the end of the process you may be left with a number of deleted end-user mailboxes in Exchange System Manager. They will all show Zero, One, or Two items. You can leave them as they are, and, provided you are still on the default settings of Exchange, Exchange will delete them after 30 days. Alternatively, you can decide to delete them straight away. Delete only end-user mailboxes, nothing else (ie. leave SMTP, System Attendant, and SystemMailbox for example). To do this simply right-click on one of those empty mailboxes and choose Purge. Our advice: do a backup of your entire new server first before doing this, just in case you delete the wrong mailbox !!!
Restart the **SMTP Virtual Server** so that emails can be delivered to end-user mailboxes and so that they can be sent from your server:
- Open *Exchange System Manager*.
- Drill down to *Servers*.
- Find your server.
- Drill down to *Protocols*.
- Drill down to *SMTP*.
- Right-click on *SMTP Virtual Server*
- Choose **START**.

- **Reconnect your server to the network.**
- **Reboot the server.**
- **Backups, Backups, Backups.** Backup your server, with proper backup software this time, and to a tape drive.

That's it. You're done!