99-9

E11-99-9

P.Hagen[1], A.Pace[2], V.Puzynin, V.Samoylov, A.Taddei[3]

OVERVIEW
OF THE MICROSOFT MAIL MIGRATION PROJECT

---

[1]Microsoft Mail Migration Project Leader, Information Technology Division, CERN, Switzerland
[2]NICE Central Services Section Leader, Information Technology Division, CERN, Switzerland
[3]NICE Mail Services Section Leader, Information Technology Division, CERN, Switzerland

1999

Хаген П. и др.
Обзор проекта по замене Microsoft Mail

Дано обоснование и изложены причины возникновения проекта по замене Microsoft Mail структуры, поддерживаемой в ЦЕРН. Рассмотрены преимущества проекта как для администраторов почтовых серверов, так и для пользователей. Подробно изложена его реализация, которая включает предварительную административную организацию, создание специального программного обеспечения для конвертирования почтовых сообщений в формат Netscape Mail, обучение и консультацию пользователей. Данная работа может рассматриваться и как подробная инструкция, поскольку в ней изложены шаг за шагом последовательности действий администраторов и пользователей со стандартным и специально разработанным программным обеспечением.

Hagen P. et al.
Overview of the Microsoft Mail Migration Project

The substantiation and reasons of the starting of the Project for migration of the Microsoft Mail supported in CERN are given. The advantages of the Project for mail administrators and mail users are considered. The realization of the Project includes the administrative organization, creation the special software for converting mail messages to the Netscape Mail format, training and consultation of the users. The article is the completed instruction including step by step the user and administrator work with standard and developed software.

Introduction

The present article describes the reasons of the starting and main steps of the MSM (Microsoft Mail) Migration Project in CERN (European Organization for Nuclear Research). The realisation of the Project includes three main steps:

1. Administrative organization and choice of the strategy,
2. Creation of the software,
3. User's training and process support,

where the first and second steps are solved.

The authors believe the article will interest from one size for mail administrators and from another size for mail users as the short instruction and report about the organization and support the large Mail Migration Project in scientific institute. Arnaud Taddei and Per Hargen reported the main ideas and results on the IT (Information Technology) seminar 3 November 1998.

CERN has built a unique mail service for the whole site. This service can be accessed world-wide from any computer connected to the Internet using IMAP (Internet Mail Access Protocol, based upon TCP/IP) as well as the protocols SMTP (Simple Mail Transfer Protocol for sending and delivery of mail), LDAP (Lightweight Directory Access Protocol for the directory service), NNTP (Network News Transport Protocol).

There are several reasons why it makes sense to have all people using the same central E-mail system.

From the professional point of view

- *The Year 2000 Bug!*

MSM consists of many software components which are rather old and which are not certified for passing the year 2000 bug. It is clearly out of question to redesign this service for that.

- *Homogeneous*

One team of people can support the entire site. User support does not depend which E-mail system or computer platform you use.

- *Reduced complexity*

MSM is a proprietary E-mail system. Rather than using the Internet standards directly, gateways are required to translate all E-mails. This introduces incompatibilities and makes trouble-shooting more difficult. The central mail server does not have such problems.

- *MSM no longer supported by Microsoft*
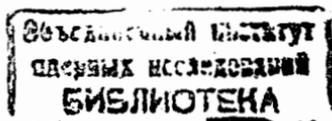
Microsoft stopped enhancing MSM around 1993. The architecture it is based upon does not scale with the huge increase in number of E-mails transferred per day. CERN has implemented a central mail service based upon the latest Internet mail protocols, and which will continue to be enhanced. This service is already servicing 10 000 users.

From the user's point of view

- *Location independent service*

MSM does not support the connection to the central mail server from anywhere in the world Internet (home, other site). MSM only works with a NICE (Network Integrated Computer Environment) PC connected to the CERN LAN (Local Area Network). Since the E-mail is stored in the mail server, you can access all your E-mails, not only new E-mails arriving.

- *Web integration*

The E-mail clients, like Netscape, are integrated with the Web. They understand HTML, which can be used to make more, advanced formatting. Web hyperlinks work in the way you expect. You can click on a hyperlink and this will launch the Web browser with the given URL. Add your visit card to the E-mail automatically. None of these features will ever be available in MSM.

- *Other services*

Only the mail server can offer auto-reply to all incoming E-mails (vacancy notice), auto-forwarding to another address. In addition, the E-mail clients can filter incoming E-mails.

- *Why not keeping accounts on both Netscape and MSM!*

It is not a solution to keep E-mail accounts on both MSM and the mail server. The truth is that you cannot prevent people from sending you E-mail to your MSM, even if your PEM (Physical E-mail Address) is pointing to the mail server. The reason is that other MSM users will use the GAL (Global Address List) for sending E-mails, and this directory always include all MSM users. Last but not least, the central mail server and the Netscape mail client offer more functionality than you ever had with MSM. So what are you waiting for?

Plan-graphic of the MSM Migration Project

The Project was started since November 1998 and will be completed in September 1999. The time graphic with numbers of mail users for MSM migration for each CERN divisions is present on the Picture 1.

#	Task Name
1	AS + IT + TIS = 72
2	SL = 298
3	PS = 256
4	EP = 247
5	LHC = 156
6	ST = 174
7	EST = 163
8	DSU + FI + PE = 81
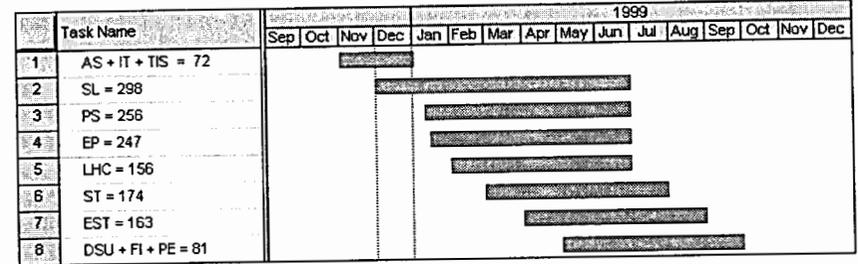
Picture 1. The time graphic for the Project.

Where the abbreviations of the CERN divisions are:

AS	Administrative Support
DSU	Directorate Services Unit
EP	Experimental Physics
EST	Engineering Support and Technologies
FI	Finance
IT	Information Technology
LHC	Large Hadron Collider
PE	Personnel
PS	Proton Synchrotron
SL(SPS+LEP)	Super Proton Synchrotron accelerator and Large Electron Proton Collider
ST	Technical Support
TIS	Technical Inspection & Safety Commission

Preparing the migration

When to use Netscape Migration Toolkit

The Netscape Migration Toolkit is the only tool we know about that is capable of migration big MSM boxes (large amount of data, folders or attachments) directly to the mail server.

This tool is working well but it is not perfect, as it is adapted to the Netscape Mail Server software, which is not used at CERN. In particular the CERN server has a folder structure, which can contain:

Sub-folders OR Messages

and not

Sub-folders AND Messages.

This forced us to build a small program called *mgt-msmail* on the Mail Server in order to provide the missing actions by the Netscape Migration toolkit software.

Moreover, addresses in the MSM header messages are not compliant to Internet standards and it was necessary to design a program called *msmaddr* which is integrated into *mgt-msmail* such that the addresses would be repaired in the best possible manner in an automatic way.

However, it is not exactly easy to use, so we only recommend it used by support personnel who will migrate **several** MSM boxes. Once you have taken the trouble to learn this tool, your effort will be rewarded each time you use it!

Migration Procedure Summary

The migration procedure consists in several steps and was designed such that one person can migrate many others from his own PC.

- The PC has to be prepared the first time. One can install the Netscape Migration program and configure it as described later in this document. This operation will insert two new menu items in any MSM session, which is started on this PC, and this will enable the possibility to migrate the data to the Mail Server.

- Then you have to determine the list of users who are candidate for a migration.

  Once this initialisation step is done, for each user you have to:

- Collect all necessary data on the user: which are his mail accounts, PEM, passwords, physical name of his Mail Server account, quotas, disk space usage on MSM, etc.

- Make sure the user is ready to migrate (did he follow the Netscape course, etc.)

- Start the MSM session and in parallel start a Telnet session on the Mail Server. This will allow you to complete auxiliary operations, which cannot be done by the Netscape Migration software.

- Then start the migration procedure.

- Once finished, don't forget to get the PEM pointing to the Mail Server for this user and close his MSM account.

All of this is rather straightforward but it is true that many details are quite important that should be well understood and are explained in the next pages.

Installing Netscape Migration Toolkit

The Netscape Migration Toolkit has to be installed on a NICE PC. Once installed it can be used for migrating as many MSM boxes as user wish. It is therefore not necessary to install it on all the user computers. The goal of the installation is to add two new items to the MSM File menu. The installation program is present on the NICE application servers and may be run on the users PC from shared disk Z: as:
Start menu
        Run Z:\PROGRAMS\MSMAIL\MIGRATE2\ADMINWIZ.EXE

Afterwards, start and login to MSM (any mailbox will do) in order to initialise the Netscape migration tool! The **File** menu now contains two new items – **Migrate Users to IMAP** and **Migrate Messages to IMAP.**
Select **Migrate Users to IMAP** first.
Answer the Wizard's questions with the following parameters:
Country: CH
Organization: CERN

Note: The Wizard never uses the following questions! Do not worry if the answers do not look quite right!

Name of mail server: mail.cern.ch
*John Smith ->***JohnS@foo.com**
List of MS Mail Users: Just select any entry
Create mail list of migrating users: Do not check
Date check: Leave as proposed by Wizard
Size filter: Min=0 Max=32767 KB (no bigger value will work!)
Do not allow users to change filters: Do not check
E-mail to use for log files: Leave this page blank

MSM box statistics

The MSM administrators maintain information about all the MSM boxes. This information is available as an Access 97 database (see Picture 2).

Picture 2. Database with mailbox information.

Here you will information like for each account the corresponding full name, size of the mailbox (which is important for estimating disk quota needed on the mail server), division, if the user has a mail server account, the value of the PEM.

What to do in advance for each account

Use the Web browser to lookup information about the user to be migrated. Go to *CERN home page*, then select *Phone Books*, lookup the accounts of the user as in the following example (see Picture 3).

• Does the user have a mail server account (search for the **MAILSERV** service)?

If yes, notice the account name (login) and the administrative computer group it belongs to. In the previous example **Per HAGEN** has mail server account **hagen** and the administrative computer group is **DS**.

If not, the Group Administrator must create the account by running the tool *xuserreg* on a central UNIX computer like RSPLUS.

Note: It is strongly recommended to keep the same account name on both NICE and the mail server.

Picture 3. Checking that the mail server account exists.

• You also need to know the name of the physical mail server where the mailbox is (this is the only time you need to know this detail, normally the users access the mailboxes via the logical name **userid**.mailbox.cern.ch).

Open a DOS box (command prompt) and type the command *host* **userid**.mailbox.cern.ch where **userid** is the mail server account. The response from the command is the physical mail server. Example: *hagen.mailbox.cern.ch* gives *mail4.cern.ch*.

• Do you know the passwords for the Microsoft mailbox and the account on the mail server? User Support can change passwords if necessary.

Note: Passwords on the mail server are case-sensitive. Make sure the *Caps Lock* key is not on.

• Ask the owner of the MSM box to delete all E-mails, which no longer is needed. The result of this cleanup will decide two major parameters for the migration – **disk quota** and **folder structure** (simple or nested).

Preparing the MSM box before migration

The owner of the MSM box will often do this work.

The folder structure of the MSM does not correspond to what is supported by the central mail server. Therefore some adjustments might be needed. In addition, it is an excellent opportunity to cleanup by deleting obsolete E-mails.

The mail server only allows a folder to contain either E-mails OR other sub-folders, but MSM allows both E-mails and sub-folders. The following

example (see Picture 4) shows a mailbox, which contains only top level folders (no +/- sign next to the folder name).
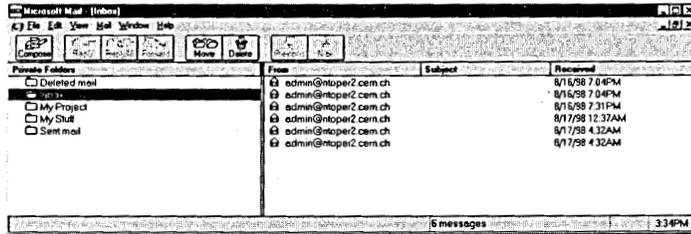
Picture 4. Simple (flat) folder structure.

The next example (see Picture 5) shows a mailbox, which contains sub-folders.
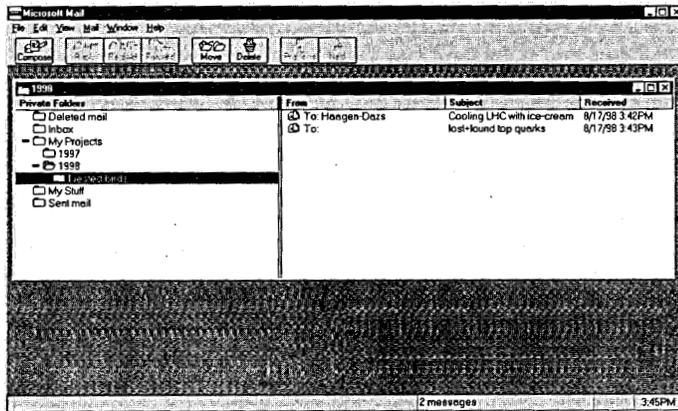
Picture 5. Nested folder structure.

The folder *My Projects* contains sub-folders *1997* and *1998.*

Notice that the sub-folder named *1998* contains both 2 E-mails (shown in the right window) and 1 sub-folder named *Nested birds.* The mail server can not support this. Resolve the conflict by moving the folder *Nested bird's* 1 level up (*File* menu – *Folder properties*).

Rename folders such that they only contain recommended characters. It is better to avoid accents. The reason is that some IMAP clients may not handle it. In addition avoid the characters: / \ : * ? " < > | ( ) [ ] { } ' $

Changing the PEM

The current logged in user can change his PEM by using CERN Phone Book application. The Group Administrator can change the PEM with *xuserreg* utility on a central UNIX computer like RSPLUS.

If the first case apply, start the *Phone Book* application (*Start menu – More Applications – Accessories – Phone Book*). Search for yourself (the NICE user to be migrated). Select the *More info* button and then the *Change* button.
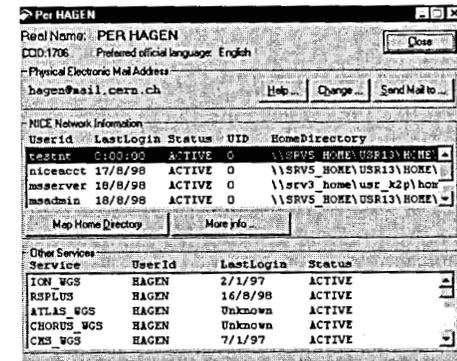
Picture 6. Phone Book – Search Account – Change button.

Picture 7. Phone Book – Mail info – changing PEM.

Select the *Mail Info* button. Finally you can change the PEM.

The PEM must **not** refer to MS Mail anymore. It refers to MS Mail if the address format is **userid@xx.*msm.cern.ch***.

The PEM should almost always point to the mail server, so it takes the format **userid@mail.cern.ch** where **userid** is the mail server account.

Adjusting disk quota before migration

Use the Access database described in the section *Microsoft Mailbox statistics* to estimate the space needed on the mail server.
WARNING! If the user already has an account on the Mail Server, he probably uses some disk space. Thus, don't forget to add this disk space to the one he is currently using on MSM in order to get the final quota that you must set on the Mail Server.

If you are Space Administrator of the mail server account, run the tool *xspaceadm* on a central UNIX computer like RSPLUS to adjust the disk quota.

Note: The user can check his disk quota by login to his mail server account and give the command *quota*. Try *man quota* if this does not work, as the exact syntax might be a function of the UNIX flavour.

When you calculate your quotas, always take some extra space as the attachments encoding on MSM are compressing the data 25% more than with the base64 algorithm. So don't add 25% more quotas to the overall data space but take 10% more disk space because all your mail messages don't contain attachments!
Basically use the following formula:

New Quota = Space Used + MSM size * (1 + Fe) + New Free Space,
where:
Fe = 0.1   if there are some attachments,
Fe = 0   if there are no attachments in the folder,
Fe = 0.3   if there are many attachments.

Preparing mail server account before migration

Login to the mail server account from the Telnet session: *telnet userid.mailbox.cern.ch* (for example: *telnet hagen.mailbox.cern.ch)*. Keep this session open during the migration since you will need it all the time.

Check auto-forward

Check that the mail server account does not have an auto-forward towards Microsoft Mail. Use the command *mailfwd* to verify that either nothing is being forwarded or at least that the forwarding address does not end with *.msm.cern.ch*

Picture 8. Checking no E-mails being auto-forwarded to MSM.

Create folder structure

The data structure on the mail server must be created in order to be able to migrate. For this purpose you use the command *mgt-msmail:*
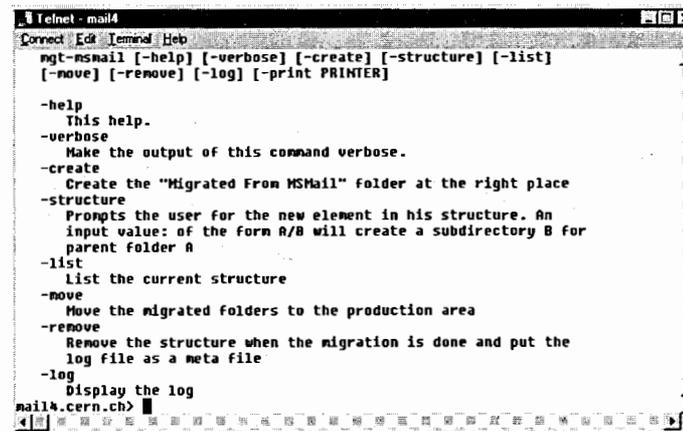
Picture 9. The mgt-msmail command.

Type the command:

mgt-msmail –create

This creates the personnel folder *"Migrated From MSMail"* which will store E-mails during migration.

Creating nested folders on the mail server

If the MSM box contains sub-folders (nested folders) then you have more work to do. If not, skip to next section.

You need to create the sub-folder structure before migrating. This is easiest explained by example. Recall that in the previous example of cleaning up the MSM box the resulting folder structure became:

Deleted mail
Inbox
My Projects
    My Projects/1997
    My Projects/1998
    My Projects/Nested birds
My Stuff
Sent mail

The only folder, which contains sub-folders, is *My Projects*. Therefore we also have to create this folder on the mail server. No other folders need to be created. Type the command:

mgt-msmail –structure

My Projects

Note: Do not quote a folder name even if it contains spaces (forget for a moment that this is UNIX!). If you create a folder containing a spelling mistake, just leave the folder as is, and repeat the command until you are sure all folders are created with the same spelling as in MSM.

An alternative way of thinking about it. A folder, which contains sub-folders, is called a **parent** folder. For the migration to work, all parent folders must already exist. The *mgt-msmail –create* command creates the parent of the entire structure. Folders like *My Stuff* and *Nested birds* are not parent folders and therefore there is no need to create them.

This example shows how to create a folder one level deeper:

mgt-msmail –structure

My Projects/Deeply nested

The migration can now start.

Migrating a mailbox

Login to the MSM box to be migrated (you can be logged into another NICE account)

Migrating the PAB

Send a copy of the PAB (Personnel Address Book) to the mail server account. Select **Mail** menu – **PAB List**.

This will create the ASCII file PABLIST.LOG in the Windows directory (C:\W95)
Run the command:

        msmpab userid@mail.cern.ch

from the command line. Type msmpab -? for more information.

This will convert and send the PAB as attachments to the user. Instructions for the user are given inside the E-mail.

Hint: Send first a copy to yourself when migrating the first user to make sure you are familiar with the instructions and the contents of the PAB E-mail.

Migrating the folders

Start the *User Migration* Wizard by selecting **File** menu – **Migrate Messages to IMAP**.

Be patient! It might takes as much as 3-5 minutes for the wizard to start up if the MSM box is very big. Also note that the user interface window of the wizard easily can be hidden under some other window (try minimise the other windows).

If you still cannot make the Wizard appear, or experience weird problems later on, do a repair of the MSM box. Do this by pressing function key *F10* upon login to the MSM box (the real MSM login, not the NICE mail login! Hint: omit the password in the NICE mail login dialog box).

Picture 10. User Migration Wizard – Step 1.

Fill in the next window (see Picture 11) with **userid@mailX.cern.ch** where *userid* is the mail server account, and *mailX* is the physical mail server. The password is the password for the mail server accounts (case-sensitive).

Example: *hagen@mail4.cern.ch*

Uncheck the option *Move Address Book* because this option does not work.

Picture 11. User Migration Wizard – Step 2.

In the next window (step 3) you select which folders to migrate. In most cases you should be able to select all. If the migration procedure fails somewhere in the middle you can repeat it and only select the folders, which failed.

Picture 12. User Migration Wizard – Step 3.

In the next window (step 4) you select the date interval you want to migrate. Unless the user has told you something else, make sure you select all (*from* as shown in the figure and *to* as today's date). Make sure *Since Last Migration* is not checked! Also leave the *size filter* as shown in the figure.

Picture 13. User Migration Wizard – Step 4.

Now, click *Next* and *Finnish* to start copying of E-mails. Ignore the message telling about the migration of the address book. Not implemented!

If something goes wrong, it is good to know that the migration only copies data without deleting anything in the MSM box, so the procedure can be repeated, and the user can use his MSM box afterwards should the migration turn out to be a failure.

The *Debug Messages* window tells about the progress of the data copying. Typically a new item is copied every 1 or 2 second.

Picture 14. Debug Messages Window.

If you are migrating a fairly large mailbox you should see a lot of scrolling messages (be suspicious if not).

Note: that attachments are migrated as separate items.

The messages you see towards the end (*Error in recv, Error in reading from socket*) are not errors at all! What you should see is *Connection with IMAP successfully terminated.* If something really goes wrong, it will most like hang the PC or at least MSM and a complete reboot will be needed. Reason, MSM is an old 16-bits application, and the Wizard has some problems.

Note: that empty folders are not migrated!

When this operation is finished the folders are on the mail server but you will not see them with Netscape. This is because they are not stored in the production area.

Moving the mail folders into production

Login to the mail server account and type the command:
mgt-msmail –move
This moves the *Migrated From MSMail* structure into the production area.

If your migration really got messy and you no longer know in what state it is, you can reset (delete) the migrated data structure with the command *mgt-msmail –remove* and start all over again.

Checking the migration

In the Telnet session you can print the log with the command
*mgt-msmail –log –print **PRINTER,***
where ***PRINTER*** is something like 31-1029-dci (UNIX xprint names).
Start Netscape and login to the mail server account
Check that all the migrated folders appear (except empty folders)
Check that the migrated folders contains a reasonable amount of E-mails and that the E-mails as well as attachments are readable

Note: that MS Mail folder *Inbox* has been renamed to *Inbox.msm* to avoid name conflict with the real Inbox on the mail server. If you do the *mgt-msmail –move* several times for the same account, the transferred *Inbox* is renamed to *Inbox.msm.1* or *.2* and so on. Nothing is lost. The folder *Sent Mail* contains copies of mail sent from the MSM box while *sent-mail* contains copies of mail sent by Netscape mail.

Note: that addresses in most migrated E-mails have been translated to Internet standard. However, in some cases you will not be able to do a Reply on the migrated E-mail. But you should always be able to find the address in the CERN global address book inside Netscape.

Finishing the migration

Now, the user must validate the migration. Once s/he confirms that E-mails are migrated correctly, request that MSM box is deleted. Do not wait many days between the migration and the deletion of the mailbox. This will only make more new E-mails in the MSM box and add more work to forward the E-mails.

The Group Administrator should delete the mailbox. Make sure that you request that **only** the MSM box should be deleted to avoid that the NICE account disappears as well.

E-mails that it sent to the Microsoft Mailbox **after** it has been deleted will be returned to the sender. This is the best we can do! Microsoft Mail does not allow us to return an E-mail explaining that the user has changed E-mail address and so on.

This problem is not as bad as it seems. CERN has encouraged the use of GEM (Generic Mail Addresses) for years. The centrally supported listbox servers will automatically be updated if the PEM changes. Since the CERN E-mail directory is available on the Web, the new addresses can be verified as well. Last but not least, people who still think they might miss E-mails can ask Per HAGEN for checking the MSM log files. In this way we can spot who is still using outdated addresses.

Conclusion

Although the procedure is robust it is not bullet proof and there are traps. In general when you report problems to the central support report the 2 pairs login/password and exit from MSM such that we can run it ourselves for analysis.
The source of problems are mainly due to:
1) the quotas are not correctly adjusted,
2) probability of an MSM folder corruption,
3) probability of a message which is not correctly interpreted,
4) the date window in the Netscape tool is not correct.

The Netscape migration toolkit copies folder by folder in alphabetical order (walks the tree). The E-mails in a folder are copied by date. Oldest first. Newest last. By sorting E-mails by this criteria in both MSM and Netscape you can easily see which E-mails are not copied.

You use the tool and you see that not all messages of a given folder were not transported to the Mail Server

When a folder has problems in MSM:
- Split the problematic folder into several parts (to reduce the size). For example Inbox and Inbox2.
- Distribute the E-mails among the folders.

- Copy these folders to mail server.
- Move back the E-mails were they come from in MSM.
- Do the equivalent on the mail server using Netscape mail.

When the migration tool stops on a particular E-mail

Move this E-mail temporarily to a new folder before restart copying only the incomplete folders. Eventually do manual forward on the E-mail, which failed (if it is not corrupt!)

You use the tool and you see that no messages were transported to the Mail Server

This is because the time window is not set correctly. Make sure that in the Netscape toolkit panel
User Migration Wizard (4 of 5)
You see *From* and *To* dates which are correct! If this is not correct there is a chance that the system finds no messages for the specified dates!

While you are running *mgt-msmail -move* you see messages like: *msmaddr: Problems writing ....fixed*

This is an indication that the program couldn't move the transported folder into the production area on the Mail Server. This is often due to the fact that there is not enough quotas.

Use the formula for the disk quota calculation described in the *Adjusting disk quota before migration* section.

Migration MSM Checklist

For most understanding the MSM Migration procedure as step by step the next form (see Table 1) is recommended. The form allows for users to check the migration steps and errors.

18

Table 1. Migration Checklist.

Migration performed by :		
User concerned :		
Date migration	Begin :	End :

Installing Netscape Migration tool	❑ yes	❑ No
The user know Netscape Mail	❑ Yes	❑ No
↳ If No, plan one 1/2 day of training : see http://www.cern.ch/Training		

MSM	Login :		Pwd :
Mail server	Login :		Pwd :

	Disk quota	MSM :	Mail server :

MSM mailbox cleaned	❑ structure	
	❑ Folders names	
PEM aimed on Mail server	❑ Yes	❑ No
Auto-Forward towards MSM	❑ Reset	❑ None
Creating data structure on Mail server	❑ Yes	❑ No
Migration PAB	❑ Yes	❑ No
Migration Folders and Messages	❑ Yes	❑ No
Checking migration :		
- by yourself	❑ Yes	❑ No
- by user	❑ Yes	❑ No
MSM mailbox deleted	❑ Yes	❑ No

Remarks :

19